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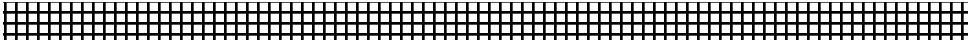
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(MACHHER CHASH O BABASTHAPANA)
AQUACULTURE AND MANAGEMENT

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গৃহীত পলি ইকোলজি
AQUACULTURE AND MANAGEMENT

গৃহীত পলি ইকোলজি একটি গুরুত্বপূর্ণ বিষয়। এটি জলচর প্রাণীর চাষ এবং পরিচালনা নিয়ে কাজ করে। এতে বিভিন্ন প্রকারের মাছ, মুরগি, কুমড়া ইত্যাদি চাষ করা হয়। এছাড়াও জলচর প্রাণীর পুষ্টি, স্বাস্থ্য এবং পরিবেশের সাথে এর সম্পর্ক নিয়ে আলোচনা করা হয়।

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mPcĪ

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cW ubt`Rbv

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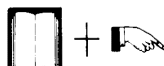
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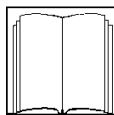
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Ablɔj b

Avcub cvtVU fƒjvfƒte eSƒZ cviƒŒb wK bv Zv hvPvB Kivi Rb" cvtVi gvtS tKvƒbv tKvƒbv RvqMvq ƒ`qv iƒqŒ Ablɔj b| Ablɔj b, ƒjv AvcbvƒK mgvav KiƒZ nte| Gme Ablɔj b Avcbvi Ávb I `ƒZv eƒxƒZ mrvqZv Ki ƒe|

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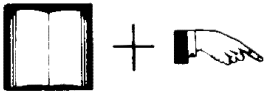
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- gvQ Pftl i , iZj; e"vL"v KiZ cviteb|

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c"lg Mtel Yvgj-K MŠ'
(treatise) cKvk Ktib|

Pxbv th c"vZ e`enri KiZv Zv wvfbvvt Dc`vcb Kiv ntqfQ| M"gvY RbMY b`x t`tk gvQ i wlg msMh KiZv| AtbK mgq Wvzviv cwbi wtpi MZ[®]t`tk gvQ i wlg msMh KiZv| Zte tenki fiv mgtq b`xtZ Rvj, gv`jy, MtQi tSv BZ"wr tdtj tcvrv tQtK tZvjv ntZv| gvQ i wlg l tcvrv Wtgi cwbtZ ivLv ntZv Ges cti e`emvxt`i KvQ wvµq Kiv ntZv| e`emvqv wvfbvRvqMv tcvrv msMh KiZv| gvQ Pftl i e`emvqv KvQ t`tk tcvrv µq Kti wtrt`i cKzi Qvov| thnZztcvrv kbv³ Kiv RvbZ bv ZvB GKB mt_ wvfbogvtQ i tcvrv GKB cKzi Qvov ntZv| th mg`l gvQ ZLb Pftl Kiv ntZv Zvi gta` wvfbv Kvc[®]gvQ, m"vgb, UvDU Dvj - LthvM" tKvb tKvb AAtj gRvi GK tKSkj Aej`b Kiv ntZv gjMxi wvtgi wFZti me wQvtei Kti tLvmU dtkv Kti Dnri wFZi gvQ i wlg w`tq fivZ[®] Kti Avevi eÜ Kiv ntZv| Gici wgvU gjMxi mvrth` KtqK w`tbi Rb` Zv w`tq Wtgi i wqZ cwbtZ (hv AvtM t`_tKB mhZvc Oviv Mig Kiv _vtK) tQto t`qv ntZv| ävtK GLvrbB

cwi c`ltbi mshM t`qv nZv Ges hZ`Y chSfbr tcvbr cKzi Qvovi Dchj nq ZZw`b chSf
Gt`i tK H WtjB i vLv nZv| tcvbr gvQtK gmj i Wvj Ges Wtgi Kzng Lveri t`qv nZv|

tivgvbiv Avevi Avi GK wekl ai`bi c`wZ e`envi KitZv| Zviv GKB cKzi wefbaRvtZi
gvQ tQto w`Z| GtZ Giv GKwU Ab`wUtK Lvl qvi mshM tcZ| th`tjv tetP`vKZ tm`tjvB
Zviv e`envi KitZv| Zviv gvQtQ Rb` wefbaLveri l mieivn KitZv| GgbwK Zviv KZ`v`mi
gvsm chSfQvQtK tLtz w`Z|

gvQ Pvl wkí (arts) ga`hjm miv BDtvc Qvotq hvq Ges AtbK Dbz c`wZ Ave`Z.nZ
_vtK| tm mgq maviYZ agfj ev cweT Nt`i m`B cKz`vKZ| agRvjvq emevmKvix
hvRtKi mS`vi l ciB cKzi AvKvi wbfP KitZv| Zte Kxfvte cKz`e`e`vcbr nZv G
e`vcvfi Zviv tKvb tiKW`i tL hvbvb|

ga`BDtvtci Kvc`gvQtQ c`g cKz`vcbr Kiv nq tPtKvk- vfwKqvq 1358 mtj | cieZr`
400 eQi chS`H cKz`tjvB gvQ Pftli tK`te`yOj | ga`hMi tktli w`tK Wg wcbPb
(Dom Pinchon) bigK GKRB agfRK me`c`g Kwlg Dcvtq UfDU gvQtQ cRbb NUvb
etj avi Yv Kiv nq|

w`DfWUvm Mvi wj K
(Theodatus Garlick)
hy`i vto`me`lg
mdj fite gvQtQ Kwlg
cRbb NUvb Ges 1857
mtj wZvb Kwlg cRbtbi
Dci Mtel Yv cEU
(treatise) cKvk Kti |

BDtvc t`tK gvQ Pvl chj Awfemx`i (Emigrant) gva`tg hy`i vto`t`Q Ges tmLvtb
gvQ Pftli Rb` chfB tcvbr mieivni wbgfE n`vPmi`vcbr Kiv nq| w`DfWUvm Mvi wj K
(Theodatus Garlick) hy`i vto`me`lg mdj fite gvQtQ Kwlg cRbb NUvb Ges 1857
mtj wZvb Kwlg cRbtbi Dci Mtel Yv cEU (treatise) cKvk Ktib|

fvi Zetl`mngZ AvKvfi ntj l cKzi Ges nt` gvQ Pvl wLtoi Rtb#i 350 eQi cteB`iiy
ntqtQ etj Rvbr hvq| cieZr`mg`q fvi tZ gvQ Pvl Avil RbvcZv cqv| Rvbr hvq th,
gw`t`i cKzi l wbgqZfvte tcvbr Qvov nZv| ga`hjm fvi Zetl`gvQ Pftli e`vcvfi tZgb
tKvb Z`cvl qv hvq br|

wbKU AZtZ G Dcgnv`tk Gm.Gj`tnviv (S.L. Hora) me`c`g gvQ Pftli tPov Ktib|
RwZms`Ni mnvqZvq wZvb 1949 mtb Om`sgUj xq gvQtQ cKzi Pvl kxl`GKwU Avtj vPbr
mfvi AvtqvRb Ktib| cieZr`Z wfgvPvi, wR.Gj`wG, Avj xKb`n Gm.w. wms, wSsi vb, GBP.
tP`ajx chj gvQ Pftl wekl Ae`vb i vLb|

evsj vt`tk gvQ Pftli BwZnm Aí w`tbi | Zte bwrí Avntg` (1947-1960) bZbfite
Gt`tk gvQ Pftli tMvoicEb Ktib| wZvb ZLbKvi grm`mzvni b`UbtW`U w`h`nb| bwrí
Avntg` gvQ Pftli Dci ht`o`iaZ t`b Ges Kwlgfvte tcvbr`Zvii nivr gvQ Pftli KvR
AŠZfj Ktib|



RvZxq Avtqi kZKiv
c`g 5.2 fvm Ges KwL.
m`u`ntZ Avtqi kZKiv
20 fvm Avtm grm`
m`u` t`tK|

Ablyj b (Activity) t evsj vt`tk gvQ Pftli BwZnm eY`v Kily| gvQ Pvl tK ifc`j x`wec`e
ejv nq tKb- Zv hy`mnKvfi Dc`vcbr Kily (Ably`100 ka)|

gvQ Pftli`iaZj

evsj vt`tki RvZxq A`BwZi Dbq`b, cyo`mieivn, Kgms`vb Ges`et`wKk g`y`ARf`b grm`
m`u`GKwU wekl`iaZcy`fvgKv cvj b Kti AvntQ| RvZxq Avtqi kZKiv c`g 5.2 fvm
Ges KwL.m`u`ntZ Avtqi kZKiv 20 fvm Avtm grm`m`u` t`tK| c`KwZK l cwi`tekMZ

Kul. I cj Dbaqb ֿ

KvitY evsj vt`tk grm` Drcv` tbi me` Z.tqT i tqTQ| grm` m`u` Ri x Abjvqx Af`šli xY Rj vktqi cwi gvY cġ 43.08 j 9| tn±i, Gi gta` c- vebf wgm gn g9 Rj vkq 40.47 j 9| tn±i Ges DcKj xq wPsw Lv gvi mn ex Rj vkq 2.61 j 9| tn±i | ZUt i Lv t_ tK 200 bWUK`ij gvBj chš`me`Z. GKviš A_ 9wZK Gj vKmn (exclusive economic zone) mvgv`K Rj vktqi cwi gvY cġ 1.66 j 9| eM`Ktj wglvri | GZ me`-Z.Rj vkq _vKv mĒEj| 1962 nĒZ 1980 mĒtj i gta` gvbtj i ֿ wK gv_ wCQygvĒQi cġB 33 Mġg nĒZ 20 Mġg nrm cvq|

cjogvb Dbaqb, Kgms`vb ewx, ֿet` wK gyt` ARB Ges Av_ 9wvRK Dbaqbi t9tĒ gvQ Pvl i _ i az; Acwi mxg|

cjogvb Dbaqb

gvĒQ fĒZ evOwj cġv` evK`i mZ`Zv GLb LtjR cvl qv` 9ri | GKmgq wQj hLb Gt`tki gvbtj i Lv` Zwj Kvq gvQ cġvb I Aveik`K Dcv`vb wntmte` vb tcZ| RbmsL`vi Amf`wEK ewx Ges km` ctY`i Drcv`b evovtZ wMtg gvĒQi wePiY t9tĒ aĒsm nI qvi dtj eZ9vĒb gv_ wCQygvQ f9tYi nvi AĒbK Ktg tMĒQ| cjog weAvbxt`i gĒZ, GKRB evsj vt`kxi cġZw`b Kgct9 45.3 Mġg tcġUb MġY Kiv DvPZ| Gi gta` Kg ct9 GK-ZZxqsk (15.1 Mġg) nte cġYR tcġUb| evsj vt`tk cġYR tcġUbtbi kZKiv 80 fĒM AvĒm gvQ ev gvQ Rivxq ֿe` t_ tK| A_ 9 12 Mġg tcġUb AvĒm gvQ t_ tK| gvĒQ kZKiv 16.5 fĒM tcġUb _vĒK| Zvntj 12 Mġg tcġUb cvl qvi Rb` 73 Mġg gvQ cġZw`b tLtZ nte| A_P eZ9vĒb gvQ f9tYi Mo nvi gvĒ 36 Mġg| GKgvĒ Dbz` cxwZtZ gvQ Pvl KtiB tKej gvĒQi NvUwZ tglvĒbv Ges cjogvb Dbaqb m`e|

evsj vt`tk cġYR tcġUbtbi kZKiv 80 fĒM AvĒm gvQ ev gvQ Rivxq ֿe` t_ tK| A_ 9 12 Mġg tcġUb AvĒm gvQ t_ tK| gvĒQ kZKiv 16.5 fĒM tcġUb _vĒK| Zvntj 12 Mġg tcġUb cvl qvi Rb` 73 Mġg gvQ cġZw`b tLtZ nte|

Kgms`vb ewx

eZ9vĒb evsj vt`tki kZKiv cġ 8 Rb tjvK gvQ aiv ev gvQ m`Uxq KvĒRi mĒ½ RwoZ AvĒQ| Db9 Rj vkq Ges t9vnbv I Mfxi mgyt` t_ tK gvQ AvniY KtiB Gme tjvK RweKv wbe9 Kti _vĒK| Zte wevfbwKvi tY cġZKj Ae`v mġo nI qvĒZ Db9 Rj vkq t_ tK gvQ aivi cwi gvY nrm cvĒ`Q| ZvB G tm±ti Kg`ms`vĒbi mĒhvM Ktg hĒt`Q| evsj vt`tki AvbĒP KvbĒP AmsL` cĒ9z`-tWvev AvĒQ| Gt` i AwKvsk cwi Z`³ Ae`tq ev Awbeo Pvl i Ašf9 | wbeo gvQ Pvl tKšKj cġqvM Ktj gvĒQi Drcv`b AĒbK ewx tcZ| wbeo gvQ Pvl KgfmP ev`lvqĒbi Rb` cġ9z` Rbkw³ cġqvRb nte| Avi GfĒteB Kgms`vĒbi mĒhvM ewx Kivi Rb` gvQ Pvl KgfmP MġY KiĒZ nte|

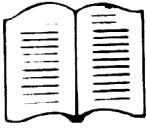
gvQ Pvl i D9aj m`vbevtK KvĒR j wMtg gvĒQi Drcv`b ewx i gva`tg cġ9z` ֿet` wK gyt` ARB m`e|

ֿet` wK gyt` ARB

ֿZwi tcvkvK I Rbkw³ i cĒi gvQB cġvb ֿe` hv t_ tK cġ9z` ֿet` wK gyt` AwR9 nĒ`Q| evsj vt`tki iBwvb AvĒqi kZKiv 5 fĒM AvĒm gvQ I gvQ Rivxq cY` thgb wPsw iBwvb t_ tK| evsj vt`tk gvQ Pvl i th m`vbev i tqTQ ZvĒK KvĒR j wMtg gvQ Pvl tRvi`vi KiĒZ cviĒj cġ9z` ֿet` wK gyt` ARB Kiv m`e|

Av_ 9wvRK Dbaqb

evsj vt`tk Mġg MĒA AmsL` cĒ9z` QwoĒq AvĒQ| GK cwi msL`vb Abjvqx evsj vt`tk cĒ9z` i msL`v 12 j 9| 80 nvrvi hvi t9vU AvqZb 15 j 9| tn±i | Gme cĒ9z` kZKiv 55 fĒM gvQ Pvl i Avl Zvq Avbv nĒtqTQ Ges kZKiv Avi I 30 fĒM gvQ Pvl i Avl Zvq Avbv m`e| evKx 15 fĒM cġZZ| cġZZ ev AvcvZ gvQ Pvl AĒhvM` Gme cĒ9z` i gwj Kvbv t`tki cġ9z`K Pvl x ev weĒnxbt` i nĒtZ | ms`vĒti gva`tg G mg` cĒ9z` gvQ Pvl Kti weĒnxb tjvKt` i Av_ 9 mvgvRK Dbaqb NvĒbv m`e| KvĒRB evsj vt`tk gvQ Pvl i hĒ_ 9 _ i az i tqTQ|



mvi gg Pxb t`tk me^cg gvQ Pvl iinyq etj cgvY cvl qv hvq/ tdb jvB (Fan Lai) bvgK GKRB Pxbv f`tjvK Kgb Kvc^(KvncP) gvQi Dci c^g Mtel Yvgj-K M^S (treatise) c^kvk Ktib/ ersj vt`tk gvQ P^tli BvZvnm Aí w`tbi/ GKRB evOvj i c^zw`b Kgc^t 45.3 M^g t^cub M^hY Kiv DvPZ/ gvQ kZKiv 16.5 f^vM t^cub ev Avngl _vtK/ ersj vt`tk c^hYR t^cub^tbi kZKiv 80 f^vM Avfm gvQ ev gvQ Rivxq `e` t^hK/ v^beo gvQ Pvl Kgm^P ev`evq^tbi Rb` c^hz Rbk^v c^hqvRb/ ersj vt`tk eZ^gtb kZKiv c^g 8 Rb tjvK gvQ aiv ev gvQ m^hixq Kv^tRi m^t_ R^voZ/ c^wZZ c^hz, tjv ms`v^ti i gva^tg gvQ Pvl K^ti c^hSK Pvlx ev v^eExb tjvK^t i Av^{_}gv^vRK Dbqb NU^tbv m^e/



cuVvEi gj`iqb 1.1

mW/K DEti i cuK W/K WPy (✓) w b

- 1/ gvQ Prl me^clg tKvb t`tk i i yiq?
 - K) Pxb
 - L) BZij x
 - M) tPK cRvZŠ;
 - N) fvi Z

- 2/ fvi Zełl^QLb gvQ Prl i i yitqWj ?
 - K) WŁłóı Rtb#i 2000 eQi cte^o
 - L) WŁłóı Rtb#i 350 eQi cte^o
 - M) 1358 mvtj
 - N) 1940 mvtj

- 3/ GKRB evWvj i cWZw`b W/K cwi gvY gvQ Lvl qv DvPZ?
 - K) 20 MŁg
 - L) 33 MŁg
 - M) 73 MŁg
 - N) 93 MŁg

- 4/ evsj w`tki i Bvb Avtqi kZKiv KZ Ask Avtm gvQ t`tk?
 - K) 3 fVM
 - L) 5 fVM
 - M) 6 fVM
 - N) 8 fVM

cW 1.2 gvtQi tkYweb`im, ugVv I tjvbr cwnbi gvtQi Zwj Kv



G cW tkI Avicb -

- gvtQi tkYweb`im m`utK`RvtZ cvi`teb|
- evsj vt`tki ugVv cwnbi gvtQi Zwj Kv`Zwi Ki`Z cvi`teb|
- evsj vt`tki tjvbr cwnbi gvQ m`utK`RvtZ cvi`teb|



gvtQi tkYweb`im

gvQ k`ailU`K GK K_vq e`vL`v Kiv c`lq Am`fe| m`aviYfite gvQ ej`z kxZj i`³ mek`o tgi`yUx c`OYxK e`svq hviv weeZ`bi mef`bae_ AmZ`ug Kti eZ`g`vb ch`f`q DcbxZ ntqtQ| me`k| eZ`g`vb RmeZ c`OYxK`j i mSL`v c`lq GK tK`vU| mnRfite tPbv Ges Dc`v`c`b`i Rb` Gme c`OYxK`z`K AmsL` q`z` q`z` tMv`ox`Z f`vM Kiv ntqtQ| me`kl me`kl Pmi`v`K` e`vkt`o`i Dci w`f`E KtiB Gme tMv`ox`Z`v`i Kiv ntqtQ| kxZj i`³ mek`o RjR tgi`yUx c`OYx hviv d`z`Kvi miv`v`th` k`jmK`v`h`c`v`i Pjv br Kti Ges tRvo ev me`f`Rvo cvL`bvi miv`v`th` c`mb`z`Z PjvPj Kti Zv`f` i`K gvQ ejv nq| Rvbr g`z eZ`g`vb mek n`v`Rvi c`R`v`Zi gvQ Av`Q| v`b`P gvtQi tkYweb`im t`qv n`j`v|

kxZj i`³ mek`o RjR tgi`yUx c`OYx hviv d`z`Kvi miv`v`th` k`jmK`v`h`c`v`i Pjv br Kti Ges tRvo ev me`f`Rvo cvL`bvi miv`v`th` c`mb`z`Z PjvPj Kti Zv`f` i`K gvQ ejv nq|

ce^o - K`W`Uv (Chordata)

Dc-ce^o f`vU`e`Uv (Vertebrata)

tkYx - A`v`Mbv_v (Agnatha) - tPv`q`v`j me`v`x`b gvQ

eM^o m`v`B`K`v`m`t`U`v`g`v`Uv (Cyclostomata)

D`vni Y- j`v`g`t`c`a (Petromyzon marinus)Ø

tjvbr cwnbi t`c`U`v`g`v`BRb t`g`v`i b`v`m (Petromyzon marinus)

ugVv cwnbi n`v`M`v`d`m (Myxine)

tkYx - K`b`v`K`_v`Bm

Dc-tkYx- B`j v`P`g`v`e`v`v`K (m`v`K`f` I ti)

eM^o i`v`R`d`i`v`g`m

cwi evi - v`c`h`v`U`v`v`

D`vni Y- v`c`h`v`U`m gvB`f`v`v`Wb (Pristis microdon) (Ki`v`Z n`v`zi)

cwi evi - v`i`b`v`f`e`v`U`v`v`

D`vni Y - v`i`b`v`f`e`v`U`m M`v`b`z`j` U`m (Rhinobatos granulatus) (gvBU`v` t`e`j`)

cwi evi - t`W`m`v`B`G`v`U`v`v`

D`vni Y - v`g`v`b`U`z`v` D`q`v`i b`v`K (Himantura uarnak) (n`v`D`m)

cwi evi - gvB`v`j I`f`e`v`U`v`v`

D`vni Y - G`f`U`v`f`e`v`U`m b`v`i b`v`i (Aetobatus narinari) (ksL`v`P`j)

eM^o I`f`i`K`f`U`j`v`e`d`i`v`g`m

cwi evi - t`n`v`g`v`K`v`B`v`j`v`v`

D`vni Y - m`v`B`z`j`v`v`K`v`B`j`v`g` c`v`st`U`U`v`g (Chiloscyllum punctatum)

Kul. I c j u Dbq b ǝ

cwi evi - t ÷ tM t ÷ v g u U w W
D`vni Y - t ÷ tM t ÷ v g v t d u m t q U m (*Stegostoma fasciatus*)

eM[®] t ǝ q w j d i u g m
cwi evi - t ǝ q w j w W
D`vni Y - t ǝ K w j I W b t m v i i v t K v q v n (*Scoliodon sorrakowah*) (n v ǝ i)

cwi evi - u i i w b w W
D`vni Y - u i i b v t e - w P (*Sphyrna blochii*) (n v Z ǝ i n v ǝ i)

eM[®] U i t c w W b d i u g m
cwi evi - U i t c w W b w W
D`vni Y - G m t U t w c t U w i w R (*Astrape dipterygii*) (B t j K u U K t i)

t k Y x - A m u U K u m
D c t k Y x - G K u U b c t U w i w R
D c - w e f i M - t U w j I m u U

eM[®] A m t U I M - m d i u g m
cwi evi - b U c t U w i w W
D`vni Y - b U c t U i m w P Z j v (*Notopterus chitala*) (w P Z j)

eM[®] B t j w c d i u g m
cwi evi - B t j w c w W
D`vni b - B j c m g v P b v U v (*Elops machnata*)

cwi evi - t g M t j w c w W
D`vni Y - t g M j c m m v B u c b t q W m (*Megalops cyprinoides*)

cwi evi - A ǝ j w e j w W
D`v - A ǝ j w e D j v f i j t c m (*Albula valpes*)

eM[®] A ǝ s B j d i u g m
cwi evi - A ǝ s B j w W
D`vni Y - A ǝ s B j v t e s M t j b u m m (*Anguila bengalensis*)

cwi evi - g w i b u w W
D`vni Y - g w i b ǝ q v g W m v i w Z (*Moringua modgarti*)

cwi evi - g y r u b w W
D`vni Y - j v B t K v W b u U m U v B j (*Lycodontis tile*)

cwi evi - A u d K u w W

BD w U - 1

D`vni Y - j`vgtbt÷vgv AwitqUwj m (*Lamnostoma orientalis*)

eM[®] Kycdi ugm

cwi evi - KycwW

D`vni Y - tUbsvtj vmv Bwj kv (*Tenualosa ilisha*)

cwi evi - ucñuUM`vmtUwi wW

D`vni Y - Bwj mv tgMvj cUiv (*Ilisha megaloptera*)

cwi evi - Bsmj wW

D`vni Y - KBwj qv tbMtj ±v (*Coilia neglecta*)

eM[®] tMtbtwi bWpdi ugm

cwi evi - PwbwW

D`vni Y - P`vtbvm P`vtbvm (*Chanos chanos*)

eM[®] mvBucñbdi ugm

cwi evi - mvBucñbwW

D`vni Y - KvZj v KvZj v (*Catla catla*)

cwi evi - c`vi vmvBtj wvi bWpW

D`vni Y - cñvi vmvBtj wvi bKvm tUbuKtj Uvm (*Parapsilorhynchus tentaculatus*)

cwi evi - mvBtj wvi bWpW

D`vni Y - mvBtj wvi bKvm Mñmuj m (*Psylorhynchus gracilis*)

cwi evi - e`vj Uwi wW

D`vni Y - evj tUvi v evgñbKv (*Balitori burmanica*)

cwi evi - tKvneUwW

D`vni Y - ewUqv tWwi I (*Batia dario*)

cwi evi - evMwi wW

D`vni Y - ugmUvm tUsMvi v (*Mystus tengara*)

cwi evi - wj gj wW

D`vni Y - I gcK cre`v (*Ompok pabda*)

cwi evi - w`j weW

D`vni Y - AvBwj qv KBj v (*Ailia coila*)

cwi evi - c`vsMwmmwW

D`vni Y - cvstMwmmqvm cvstMwmmqvm (*Pangasius pangasius*)

Kul. I cj. Dbaq b ǰ

cwi evi - A'vgenBimicUuW
D`vni Y - A'vgenBtmcm g'vsM'qm (Amblyceps mangoies)

cwi evi - imtmwi uW
D`vni Y - evMwi qm evMwi qm (Bagarius bagarius)

cwi evi - K'wi uW
D`vni Y - K'wi qm teU'Kvm (Clarias batrachus)

cwi evi - tn'Ui cubDmiUuW
D`vni Y - tn'Ui cubDm'Um d'umij m (Heteropneustes fossilis)

cwi evi - PviK'W
D`vni Y - PvKv PvKv (Chaca chaca)

cwi evi - A'vi uW
D`vni Y - A'vi qm M'vM'vi v (Arius gadora)

cwi evi - tc- v'UvrmuW
D`vni Y - tc- v'Uvrmv t'Kubqvm (Plotosus canius)

eM[®] m'vj gubdi ugm
cwi evi - m'vj t'gubW
D`vni Y - m'vj t'gv Bvi uWqvm (Salmo irideus)

eM[®] Aj ucdi ugm
cwi evi - nvi c'WbuUuW
D`vni Y - nvi c'Wb ubnwi qvm (Harpadon nehereus)

eM[®] mvBuc'bvWbuUdi ugm
cwi evi - tn'igi 'vguclW
D`vni Y - nvB'tcvi 'vgclm R'vb_c'UI vm (Hyporhamphus xanthopterus)

cwi evi - tetj ubW
D`vni Y - t'R'tbb'UWb K'vbmj v (Xenentodon cancila)

cwi evi - Ai vB'R'W
D`vni Y - Ai vB'R'qvm t'gj v'÷M'gv (Oryzias melastigma)

cwi evi - mvBuc'bvWbuUuW
D`vni Y - Gd'ubqvm uWm'cvi (Aphanius dispar)

cwi evi - c'wmij uW
D`vni Y - M'vgenq'v G'udubm (Gambusia affinis)

eM® wmbtbi_digi
cwi evi - wmbb`w_w
D`vni Y - wnc`civK`igcivm ehtKwi bKivm (*Hippocampus brachyrhynchus*)

eM® wmbetbiPdigi
cwi evi - wmbetbiPw
D`vni Y - A`igw`dcbivm K`Pqv (*Amphipnous cuchia*)

eM® t`vi w`cubdi igm
cwi evi - c- wU`tm`dij w
D`vni Y - c- wU`tm`dij vm Bw`Kivm (*Platycephalus indicus*)

eM® cvi wmdi igm
cwi evi - t`m`U`icigw
D`vni Y - t`j wU`m K`ij t`Kwi dvi (*Lates calcarifer*)

cwi evi - A`igewmmw
D`vni Y - A`igewmm bvgv (*Ambassis nama*)

cwi evi - t`mi i w`bw
D`vni Y - Gw`cub`tdj vm g`ij vewi Kivm (*Epinephelus malabaricus*)

cwi evi - w`mj w`w`bw
D`vni Y - w`mj w`Mv w`knvgv (*Sillago shihama*)

cwi evi - t`j w`ewUw
D`vni Y - t`j v`tevtUm m`vj bvtgbwmm (*Lobotes surinamensis*)

cwi evi - w`ngy w
D`vni Y - cgvtWmm Kgv mub (*Pomadasys commersonni*)

cwi evi - `úwi w
D`vni Y - A`vKvbt`vc`wMi vm t`j Uvm (*Acanthopagrus latus*)

cwi evi - mvBw
D`vni Y - cvgv cigv (*Pama pama*)

cwi evi - j YRw
D`vni Y - j Y`Rbivm Rwb (*Lutjanus johni*)

cwi evi - K`vi swMw
D`vni Y - tgMij w`m`cm Ki WwBjv (*Megalaspis cordyla*)

cwi evi - U`- wUw

gv`Qi Pvl I e`e`vcv

Kul. I c j ■ Dbqb ṽḡ

D`vni Y - Uḡ. vḡUm K`vUwi qvm (*Toxotes chatareus*)

cwi evi - ḡ`ḡUvd`vMvM

D`vni Y - ṽḡvḡUvḡdMvm Avi Mvm (*Scatophagus argus*)

cwi evi - bvbvMvM

D`vni Y - bvbWvm bvbWvm (*Nandus nandus*)

cwi evi - ḡevMvM

D`vni Y - ḡevMm ḡevMm (*Badis badis*)

cwi evi - vMkuj vM

D`vni Y - I ḡi I ḡµvvgm bvBḡj vMUKvm (*Oreochromis niloticus*)

cwi evi - BḡKvbvM

D`vni Y - ḡi ḡgvi v ḡi ḡgvi v (*Remora remora*)

cwi evi - ḡMvevM

D`vni Y - ḡMḡmḡMveqvm vMDwi m (*Glassogobius giuris*)

cwi evi - UḡBvKDi vM

D`vni Y - UḡBvKDi vm nḡgj v (*Trichiurus haumela*)

cwi evi - ḡ`ḡgvevM

D`vni Y - mvBveqig ḡ UḡvUig (*Cybium guttatum*)

cwi evi - ḡ÷ḡgvmvM

D`vni Y - ḡ÷ḡgvmvMqvm mvBḡbwi qvm (*Stromateus cinereus*)

cwi evi - PvbvM

D`vni Y - Pvbv c`vstUUvm (*Channa punctatus*)

cwi evi - A`vbvevbvUvM

D`vni Y - A`vbvevm ḡUḡ÷vMvbqvm (*Anabas testudineus*)

cwi evi - ḡej bvUvM

D`vni Y - Kuj mv ḡclmḡqUvm (*Colisa fasciatus*)

eM[®] ḡUUḡI WbvUdi vgm

cwi evi - UḡBqvK`vbv vM

D`vni Y - UḡBqvK`vb_vm evqvKuj qvUvm (*Triacanthus biaculeatus*)

cwi evi - ḡUUḡI WbvUvM

D`vni Y - ḡmḡj vḡbvWb c`vḡUvKv (*Chelonodon patoca*)

eM® uc- D`i v`bKuUdi ugm
 cwi evi - mvBt`bv`M- vmiW
 D`vni Y - mvBt`bv`M- vmm mvBt`bv`M- vmm (*Cynoglossus cynoglossus*)

cwi evi - tmvj uW
 D`vni Y - mivBvCPzv c`vb (*Synaptura pan*)

eM® gvmUv`mgteuj di ugm
 cwi evi - gvmUv`mgteuj uW
 D`vni Y - gvmUv`mgteuj vm Avi`gUvm (*Mastacembelus armatus*)

ugVv cub I tj`bv cubi maviY uKQygtQi Zwi Kv

ugVv cubi gtQi Zwi Kv

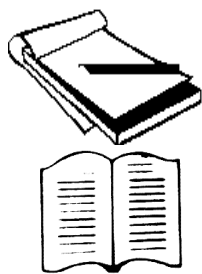
<u>ugK bs</u>	<u>ersj v big</u>	<u>eAwk big</u>
1	dij	<i>Notopterus notopterus</i>
2	uPZj	<i>Notopterus chitala</i>
3	i " B	<i>Labeo rohita</i>
4	KvZj v	<i>Catla catla</i>
5	g`Mj	<i>Cirrhinus mrigala</i>
6	Kvj evDm	<i>Labeo calbasu</i>
7	evUv	<i>Labeo bata</i>
8	fMbv	<i>Cirrhinus reba</i>
9	mi c`j	<i>Puntius sarana</i>
10	tQvUc`j	<i>Puntius stigma</i>
11	gnv`kvj	<i>Tor tor</i>
12	gv, i	<i>Clarias batrachus</i>
13	uks	<i>Heteropneustes fossilis</i>
14	tUsv	<i>Mystus tengara</i>
15	AvBi	<i>Mystus aor</i>
16	cve`v	<i>Ompok pabda</i>
17	KB	<i>Anabas testudineus</i>
18	Uvk/j vUv	<i>Channa punctatus</i>
19	tkvj	<i>Channa striatus</i>
20	MRvi	<i>Channa marulius</i>
21	tevqj	<i>Wallago attu</i>
22	WvbKvbr	<i>Esomus danricus</i>
23	gj v	<i>Amblypharyngodon mola</i>
24	Pvcj v	<i>Gudusia chapra</i>
25	tf`v	<i>Nandus nandus</i>
26	eD gvQ	<i>Botia dario</i>
27	evBg	<i>Mastacembelus armatus</i>

Kul. I cji Dbq b ĩž

28	Ziv evBg	<i>Macragnathus aculeatus</i>
29	teĵj	<i>Glossogobius giuris</i>
30	Kvĵkĵ v	<i>Xenentodon cancila</i>
31	ĵkĵ s	<i>Silonia silondia</i>
32	evPv	<i>Eutropiichthys vacha</i>
33	civMvm	<i>Pangasius pangasius</i>
34	vi Uv	<i>Rita rita</i>
35	P'vKv	<i>Chaca chaca</i>
36	Pv`v	<i>Ambasis nama</i>
37	Lĵj kv	<i>Colisa fasciatus</i>

tj vbr c vbi gvQ i Z vj Kv

<u>µĵgK bs</u>	<u>evsj v big</u>	<u>ĕAwĵK big</u>
38	Bĵj k	<i>Tenualosa ilisha</i>
39	P`bv Bĵj k	<i>Tenualosa toli</i>
40	m'v gb	<i>Salmo irideus</i>
41	ifcPĵv	<i>Stromateus cinereus</i>
42	tfUKx	<i>Lates calcarifer</i>
43	gvBU`v	<i>Cybium guttatum</i>
44	j BU`v	<i>Harpadon nehereus</i>
45	Qĵj gvQ	<i>Trichiurus haumela</i>
46	nv½i	<i>Scoliodon sorrakowah</i>
47	Bĵj KvĵK ti	<i>Astrape dipterygii</i>
48	nvZĵi nv½i	<i>Sphyrna zygaena</i>
49	cUKv	<i>Tetraodon patoka</i>
50	`vZbv	<i>Acanthopagrus datina</i>
51	Mvs gv, i	<i>Plotosus canius</i>
52	Uĵv	<i>Euthynus affinis</i>



Abĵj b (Activity) t Avcbri emoi Avĵkĵĵk ĵevfĵeRj vĵĵq th mKj gvQ AvĵQ Ziv`i %ĕAwĵK bigmn GKĵU Z vj Kv `Zvi Ki ĵj|

mvi gg mnRfĵe tPbv I Dc `vcĵbi Rb` ĵeĵkI Pvi ĵĵK `evĵĵo`i Dci ĵfĵĒ Kĵi cĵvĵĵK AmsL` ĵĵa ĵĵa tMvĵĵZ fĵM Kiv nĵĵQ| gvQ kvZj i³ ĵevĵó RjR tĵiĵŪx cĵYx hviv dĵKvi mĵvĵĵh` kĵmKivĵPvj vq Ges tRvo ĵeĵRvo cvLbvi mĵvĵĵh` Pj vPj Kĵi | eZĵvĵb ĵev nvRvi cĵRvĵi gvQ AvĵQ| gvQ KvĵŪv (chordata) cĵeP fĵvĵĵŪv (vertebrata) Dc-cĵeP A`vMbv_v, KbvĵKĵ_m I AmĵKĵ_m tkYxi AŠ-fĵĵ | iĵ, KvZjv, gĵMj, micĵĵ, gv, i BZ`v` ĵgvĵi c vbi gvQ| Bĵj k, ifcPĵ`v, tfUKx, gvBU`v BZ`v` tj vbr c vbi gvQ|



cuVvEi gj`iqb 1.2

mWk DEti i cuK UK iPy (✓) i b

1/ gvQ ej tZ UK eSvq?

K) Dò i³ nekó cŶx

L) kxZj i³ nekó cŶx hvi v dædæmi mivth` klmKvhPij vq

M) Dò i³ nekó cŶx hvi v dZKvi mivth` klmKvhPij vq

N) kxZj i³ nekó Rj R tgi yŪx cŶx hvi v dZKvi mivth` klmKvhPij vq

2/ nvzi tKvb tkYxi Ašfŷ?

K) mvBtKmtUvgvUv

L) KbWkKw_Km

M) AmUKw_m

N) A`vgudieqv

3/ iP gvtQi `eÁnbK big UK?

K) Labeo rohita

L) Labeo calbasu

M) Labeo bata

N) Labeo gonius

4/ gv, i gvQ tKvb cwi evti i Ašfŷ?

K) mvBucŶwW

L) eWvi wW

M) K`vi wW

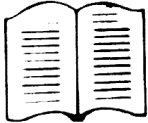
N) wj y' wW

cW 1.3 ejsjv`tki A_ʒwZK , iʒm=ubægvtQi Zwj Kv Ges Pvfvc:thvMx t`kx I wef`kx gvvtQi cwiivPvZ



G cW tkfI Avcib –

- ejsjv`tki A_ʒwZK , iʒm=ubægvtQi Zwj Kv %Zwi KitZ cvi:teb|
- ejsjv`tki Pvfvc:thvMx t`kx gvvtQi cwiivPvZ eYv KitZ cvi:teb|
- ejsjv`tki Pvfvc:thvMx wef`kx gvvtQ m=utK RvbZ cvi:teb|



ejsjv`tk cŃq 747 cRvZi gvQ itqtQ| Gi gta` 260 cRvZi igVv cvbi 475 cRvZi tjvbr cvbi Ges 12 cRvZi wef`kx gvvtQ itqtQ| Gf`i gta` A_ʒwZK fite , iaZcYgvtQi bvtgi Zwj Kv vbtP t`qv ntjv t

igVv cvbi gvQ

- 1| iB (Labeo rohita)
- 2| KvZjv (Catla catla)
- 3| gMj (Cirrhinus mrigala)
- 4| Kvj eDm (Labeo calbasu)
- 5| eUv (Labeo bata)
- 6| KB (Anabas testudineus)
- 7| gv, i (Clarias batrachus)
- 8| vks (Heteropneustes fossilis)
- 9| cvsMvm (Pangasius pangasius)
- 10| vPZj (Notopterus chitala)
- 11| cve`v (Ompok pabda)
- 12| AvBi (Mystus aor)

tjvbr cvbi gvQ

- 1| ifc Pvuv (Stromateus cinereus)
- 2| tfUKx (Lates calcarifer)
- 3| j BU`v (Harpadon nehereus)
- 4| gvBU`v (Cybium guttatum)
- 5| Qvj gvQ (Trichiurus haumela)
- 6| `vZbv (Acanthopagrus datina)

AvfcqvbKvix gvQ (Migratory Fish)

- 1| Bij k (Tenulosa ilisha)

gvQ br ntj I gvQ vntmte mavi Yfite cwiivPZ vKŠ` A_ʒwZK fite LgB , iaZcYgvtQ ÷ vmqvi `Ńv cRvZ ntjv t

- 1| Mj `v vPsvio (Macrobrachium rosenbergii) (igVv cvbi)
- 2| eM`v vPsvio (Penaeus monodon) (tjvbr cvbi)

ejsjv`tk cŃq 747
cRvZi gvQ itqtQ| Gi
gta` 260 cRvZi igVv
cvbi 475 cRvZi tjvbr
cvbi Ges 12 cRvZi
wef`kx gvvtQ itqtQ|

th gvQ igVv cvbi t`tk
tjvbr cvbtZ Ges tjvbr
cvbi t`tk igVv cvbtZ
cwi agY Kfi ZvtK
AvfcqvbKvix gvQ etj |



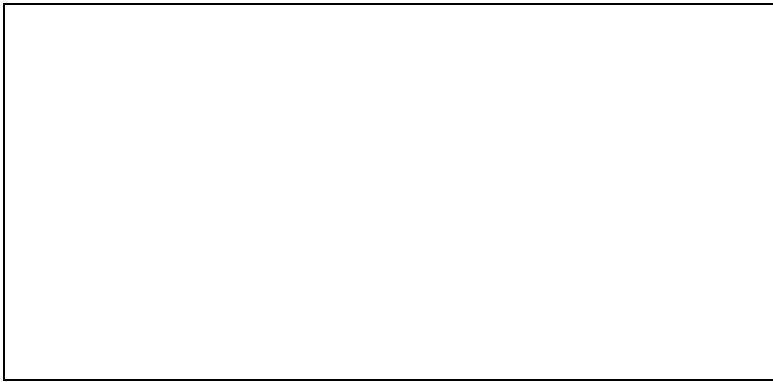
Ablaj b (Activity) t Aivbri Dcfrjvi A_`wZK , iazm`ubegvtQi (e`AvibK bvgmn) GKiu Zinj Kv`Zwi Kily Ges Gt`i A_`wZK , iazjeybr Kily|

PfIvc`thl`k` kx I vet`kx gvtQi cni`PvZ

1| KvZjv (Catla catla)

fvi Z, ersj vt`k I ngqvbgvti GB gvQ cvl qv hvq| Gii wKtkvi I cY`eq` Dfq t`fT`B c`wYR c`w`Ub Lvq Zte wKQymKQyA`ij wR tLtz citi | BwUqvb tgRi KvtcP gta` KvZjvi e`w`i nvi metPfq teik Ges Gii metPfq eo ntq`_vtK| `B t`_tK wZb eQti i gta` Giv thSb cwi c`Zv jvf Kti | KvZjv `rfmeKfite b`xtZ tgSngx e`w`cvtZi mgq Gic` t`_tK AvMf`i gta` cRbb Kti _vtK| cRbb mgta b`x t`_tK A_ev c`Yw`Z cRbtbi (Induced breeding) gva`tg n`vPwi t`_tK Drcw`Z KvZjvi tcvb mslMh Kiv hvq| Mto c`Z M`g` `wK IRtbi Rb` KvZjv 150wU wWg t`qvi `fIgzv i`vL (wP` 1)

BwUqvb tgRi KvtcP gta` KvZjvi e`w`i nvi metPfq teik Ges Gii metPfq eo ntq`_vtK|



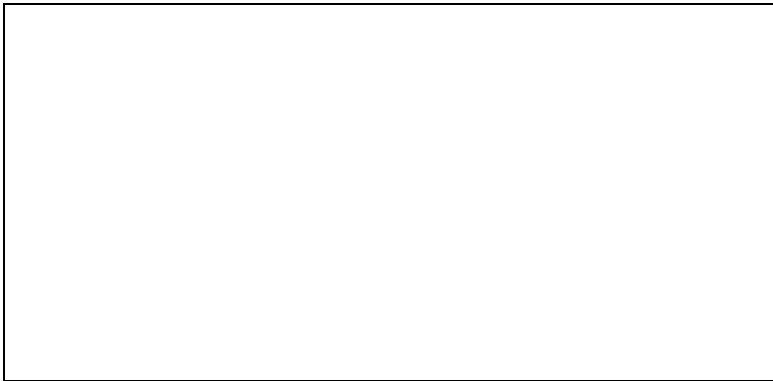
wP` 1 t KvZjv

2| iB (Labeo rohita)

fvi Z I ersj vt`tki b`-b`xtZ iB gvQ wP`iY Kti _vtK| Giv eo Ae`lq c`w`Ub I c`Bbkj `Re c`v` Ges wKtkvi Ae`lq `iayc`wYR c`w`Ub tLtz _vtK| w`Zxq eQti i tktli w`tK Giv thSb cwi c`Zv jvf Kti Ges t`tni c`Z M`g` IRtbi Rb` 200wU wWg t`qvi `fIgzv i`vL| iB gvQ `rfmeKfite b`xtZ gvP`_tK RjvB gvm c`fS` wWg w`tq`_vtK| GQvor c`Yw`Z cRbtbi gva`tg Ly mntRB iB gvtQi tcvb Drcv`b Kiv hvq (wP` 2)|

wP` 2 t iB

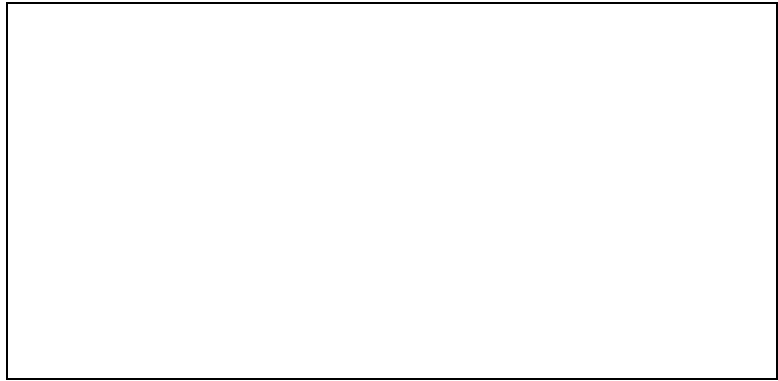
iB gvQ b`xtZ gvP` t`_tK RjvB gvm c`fS` wWg w`tq`_vtK| GQvor c`Yw`Z cRbtbi gva`tg Ly mntRB iB gvtQi tcvb Drcv`b Kiv hvq|



3/ ḡMj (Cirrhinus mrigala)

ḡMj mṽaviYZ
Zj ḥ ḥki ḥRe c ḥṽ
ḥLṽq ḥṽK|

ḡMj ḡvQ fvi Z I evsj ṽḥ ḥki b ḥḥZ cvl qv ḥvq| GB ḡṽQṽi evṽḥK Aeḡe AṽbKṽUv i ḡ Gi
mṽḥ ḥḡṽj ḥvq| eq ḥ ḡMj mṽaviYZ Zj ḥ ḥki ḥRe c ḥṽḡLṽq ḥṽK| Giv cṽḡUbl ḥLṽq
ḥṽK| GK eQi eqṽmB Giv ḥḥḥb cṽi c ḡZv j ṽf Kṽi | cḥZ Mḡḡ ḥḥṽK I Rṽbi Rb ḥ Giv 50-
100ṽU ṽḡḡ ṽḥZ cṽḥi | Giv ḥṽṽeKfṽḥe b ḥḥZ ṽḡḡ ḥḥq| cḡYṽḥZ cRḥḥbi ḡṽḥḡl
mṽḥRB ṽcṽbṽ Drcṽḥ b Kiv ḥḥZ cṽḥi (ṽPṽ 3)|

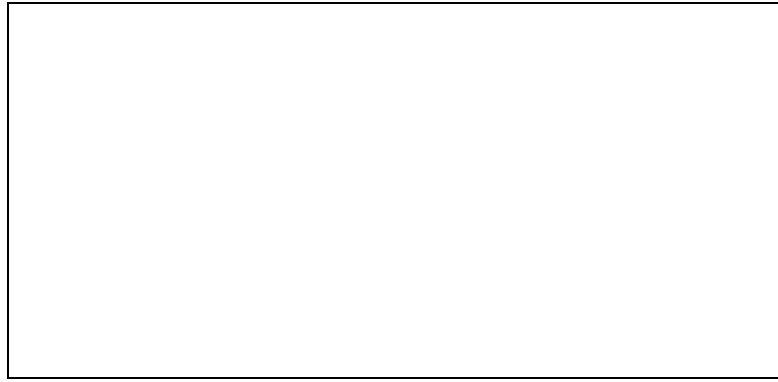


ṽPṽ 3 t ḡMj

4/ ṽmj fvi Kivḡ (Hypophthalmichthys molitrix)

ṽmj fvi Kivḡcṽmbi
Dcṽḥi ḥḥ Ges ḡṽḥ
ḥḥi Lṽvi Lṽq| dṽBṽUv
cṽḡUḥ ḡḥi cṽṽb
cḡKṽZK Lṽḥ|

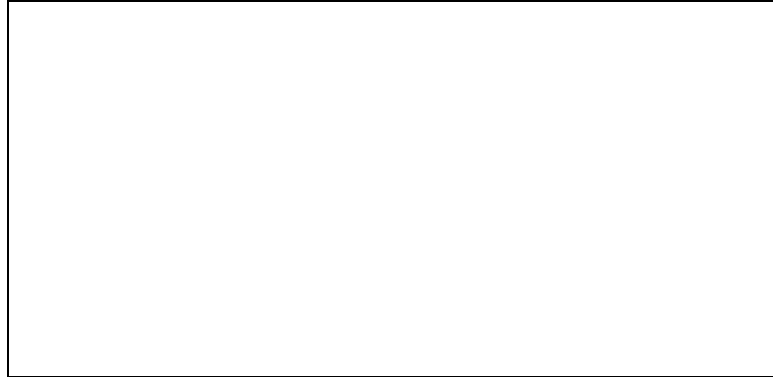
ṽmj fvi Kivḡcḡ Drcṽḥ Pṽb ḥ ḥk ṽḥj I eZḡṽḥb GB ḡṽḡU ṽṽṽḥḥḥḥ ḥk Pṽl Kiv ṽḥḥḡ| ḥiYy
ṽcṽbṽ Ae ḥḡḡ ṽmj fvi Kivḡḥi ṽḡḡṽi bṽḡK Rḥ cṽḡUḥ Lṽq| Giv cṽmbi Dcṽḥi ḥḥ Ges ḡṽḥ
ḥḥi Lṽvi ḥLṽq ḥṽK| dṽBṽUv cṽḡUḥ ḡḥi cṽṽb cḡKṽZK Lṽḥ| ḥḥ ev ṽZb eQi eqṽm
ṽmj fvi Kivḡḥḥḥb cṽi c ḡZv j ṽf Kṽi | ḡṽḡḡ Ges RjṽB ḡṽḥmi ḡṽḥ b ḥḥZ Giv cRḥḥ
Kṽi | Pṽl Kivi Rb ḥ cḡYṽḥZ cRḥḥbi ḡṽḥḡ ḡḥi ṽcṽbṽ DrcṽḥKiv AveḥḥK| cḥZ Mḡḡ
ḥḥṽK I Rṽbi Rb ḥ Giv 150-200ṽU ṽḡḡ ṽḥZ cṽḥi (ṽPṽ 4)|



ṽPṽ 4 t ṽmj fvi Kivḡ

5/ **weMtnW Kvc** (Aristichthys nobilis)

weMtnW KvtcP DrcwEi Pxb t`tk| wKtkvi I eq` Dfq Ae`vq Dw`c cwUub I cOYrR
cwUub Lvq| Giv t`Ltz AfbKUvB wnj fvi KvtcP gZ i aygv_v Zjbrvj-Kfite eo| weMtnW
Kvc`KvZjvi mstM Prl Kiv DwPZ bq hw` br tcvbr Qvovi nvi mgSq Kiv nq| weMtnW Kvc`
wZb t`tk cVDeQtii gta` thsb cwic`Zv jvf Kti| cKzi Prli Rb` cOYw`Z cRbtbi
gva`tg Gt`i tcvbr Drcv`b Kitz nte (wP 5)

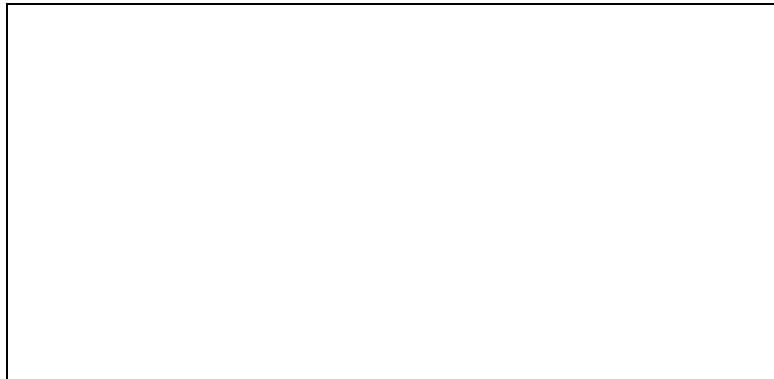


wP 5 t weMtnW Kvc

6/ **Mm Kvc** (Ctenopharyngodon idellus)

3 tm.wg. j`af nl qvi ce`
chsfGiv cPz cOYrR
cwUub Lvq wKs`Gi ci
ciB Giv Rj R eo
AvMvQv Ges cKzi tKtU
t`qv Wwzvi AvMvQv tLtz
i iyKti|

Mm Kvc`Pxtbi wKQyAsk Ges fZc e`tmwftqZ BDwbqzbi wKQyAsk evm Kti| 3 tm.wg.
j`af nl qvi ce`chsfGiv cPz cOYrR cwUub Lvq wKs`Zvi ciciB Giv Rj R eo AvMvQv
Ges cKzi tKtU t`qv Wwzvi AvMvQv tLtz i iyKti| Mm Kvc`B t`tk wZb eQtii gta`
thsb cwic`Zv jvf Kti| cKzi Prl Kivi Rb` Gt`iK cOYw`Z cRbb Kti tcvbr Drcbe
Kiv Avek`K| cOZ Mlg``wK I Rtbi Rb` Gt`i wltgi msL`v 75 ntq`vK (wP 6)|

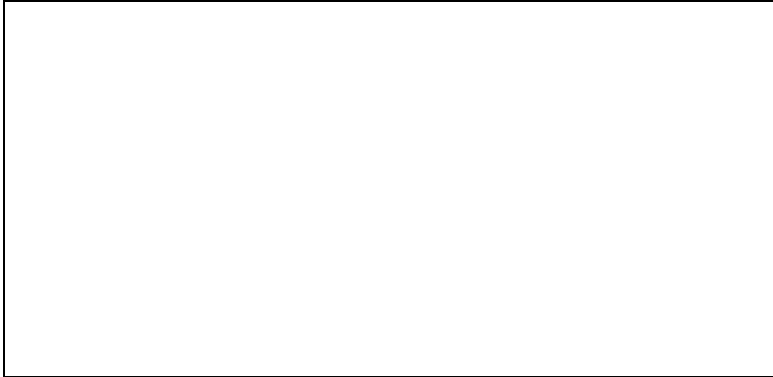


wP 6 t Mm Kvc

7/ KwcP (KgbKvcP) (Cyprinus carpio)

KwncP gvtQi Pviu RivZ
AvtQ/ tm, tju ntvjv -
t-j Kvc,ugii Kvc,
tj`vi Kvc, Kgb KvcP
Giv mePK Ges cKzi i
Zj t`tki Lvevi tLq
_vtK/

KwncP Pxb t`tki gvQ/ Zte eZgvtb cLq me t`tkB G gvQ Pvl Kiv ntvj _vtK/ KwncP gvtQi
Pviu RivZ AvtQ/ tm, tju ntvj vN t`j Kvc,ugii Kvc,tj`vi Kvc, Kgb KvcP Giv mePK
Ges cKzi i Zj t`tki Lvevi tLq _vtK/ 10 tm.ug. j`v ntvj B Giv GK vetkI Lv`vf`vm
MhY Kti | Giv Me Me Kti Kv`v gyl tbq Ges Dnvi `Re Ask tQtK mbq evKvUKztdtj
t`q/ hvi dtj KwncP gvQ th cKzi _vtK tm cKzi i cwb me mgq tNiv nq/ MhYgUj xq
t`tk KwncP gvQ 6 gvm t`tk t`o eQi eqtmi gta` thSb cwi c` Zvjvf Kti | Giv cLq miv
eQiB wWg t`q Zte emSKvj I kirKvj wWg t`qvi tkb mgq/ tcvbr cLbi Rb` Gt`i
cYw Z cRbtbi `iKvi nq br/ cLZ Mhg `nk IRtbi Rb` 100-200 wWg w`tz cvti
(wP 7)



wP 7 t KwncP

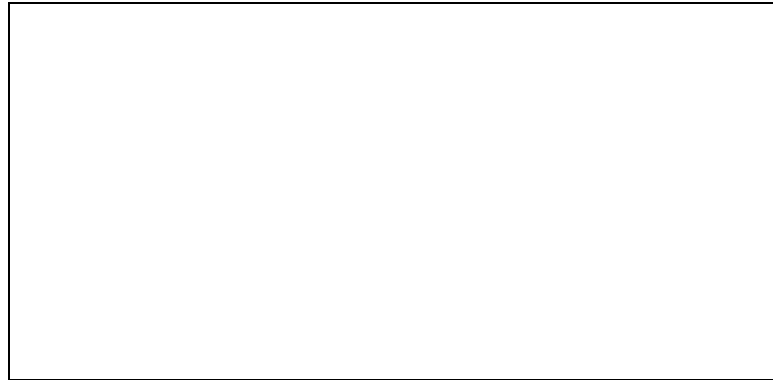
8/ tZj wcvq

AvncKvi wvfbre:AA`tj tZj wcvq gvtQi w`vZ ntvj | Zte eZgvtb eu t`tk Gt`i Pvl
nt`Q/ cLq 100 wWg wvfbre:Rwzi gvQ G MhYi AShY | Zte cKzi Pvl Kivi Rb` wZbu
cRwzB tenk e`euZ nq

- N`bxj tZj wcvq (Oreochromis niloticus)
- N`jvj tZj wcvq (Oreochromis mossambicus)
- N`exj tZj wcvq (Oreochromis aureus)

Avgt`i t`tk cLg `tju Pvl Kiv nq/ Dvij wLZ wZbu cRwzi tZj wcvq dlvrbvi Rb` wWg
gyl i gta`B ivtL/ wWtgi Kmg _uj Aej j`n qvi ce`chSf Zviv wWg tcvbr gylB ivtL Ges
cti evBti tQto t`q/ Zvici I tKvb KviY tcvbrvixZ ntvj mvt_ mvt_ 15 w`b eqm chSf
gv gvtQi gyl i tFzi cLek Kti AvEi qv Kti |

mktkvi Ae`iq Giv meFK, dvBtUrcw/Ub, Ry cw/Ub I cBbkij `Re c`v`tLiq tetP
_vtK/ cY`eq` Ae`iq Giv dvBtUrcw/Ub, Ry cw/Ub c`vb Lv` intmte tLiq _vtK
(wP 8)



wP 8 t tZj mcqv

9/ AwdKvb gv₂ i (Clarias gariepinus)

GB gvQ AwdKvi newfbwAA`tj `rfmeKfite civl qv hvq/ 1989 mtb ersj vt`tk c`g GB gvQ
Avg`mb Kiv nq/ mktkvi gv₂ i Ryc- v/Ub I KxUcZtzi jvfPLv` intmte MhY Kti / c`B
eq` gvQ meFK/ newfbwAA`tj I Dwm`c RvZxq Lv` e`Giv tLiq _vtK/ AwdKvb gv₂ i t`o
t`tk` eQti i gta` cRbb`g nq/ gvQI IRtbi I ci wbfP Kti wltgi msLv 160000
Gi gZ nq/ cktzi Pvl I Rb` G gvQI cYw`Z cRbb Avek`K (wP 9)

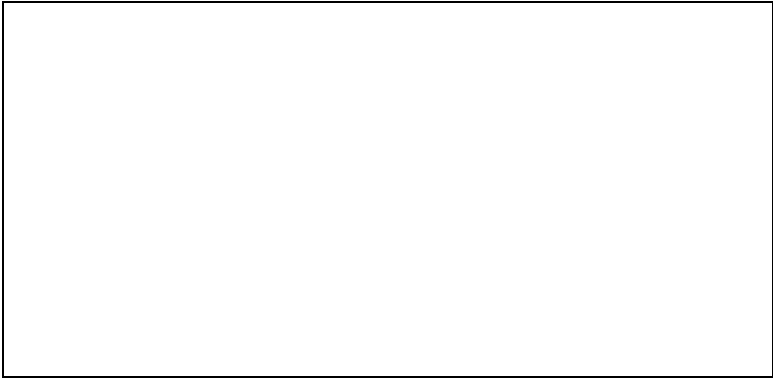
c`B eq` AwdKvb gv₂ i
meFK/ newfbwAA`tj I
Dwm`c RvZxq Lv` e`Giv
tLiq _vtK/



wP 9 t AwdKvb gv₂ i

10| gv, i (t`kx) (Clarias batrachus)

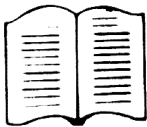
gv, i gvQ wRIj gvQmg tni gta" Ab`Zg| Giv cKZ, tWiev, wej, Rjvfiug meP Ae`vb Kti| gv, i gvQ djzKvi mnvith" cwbZ `exfZ Aw tRb MhY Kti klmKvhPvj vq Averi AwZwi³ kpmZtšj mnvith" evZvm t_tK Aw tRb MhY KiTZ cvti | ZvB Giv cwnbi evBti AfbKTY tetP_vKtZ cvti | gv, i gvQ cKzi i Zjt`tki AvarcDr`Re c`v_© KxUcZ½ BZ`w` Lvq| G gvQ GK eQti cRbb Dc`thwMx nq| el`Kvtj wej, avb t`qTZ Gt`i `rfvmeK cRbb nq| Zte cKzi Pvl Kivi Rb" cOYw`Z cRbb Avek`K| `x gvQti I Rb wntmte wWtgi msL`v 1000-10000 Gi gZ (wPĪ 10)|



wPĪ 10 t`kx gv, i



Ablyj b (Activity) : Acwi YZ I cYeq`c Ae`vq tKvb gvQ Kx Kx Lv` Lvq, KZ eQi eqtm thšb cwic°Zv jvf Kti Ges wllg t`qvi msL`v D`jllceR Pvlvc`thwMx t`kx I wej`kx 8wU (4+4) gvQti `eAwmbK bygmn GKwU Zwiij Kv`Zwi Kily|



mvi gg` evsj vt`tk cŃq 260wU wgvv cwnbi, 475wU tj vbr cwnbi Ges 12wU wej`kx cRwZi gvQ itqtQ| iB, KvZjv, gMj, cvsMhm, gv, i BZ`w` A`wZK , iZm`ubegvQ| Bwij k gvQ AwfcŃvbKvix (Migratory) gvQ| KvZjv gvQ 2-3 eQti i gta" thšb cwic°Zv jvf Kti | gv, i gvQ wRIj gvQti gta" Ab`Zg| tZj wcvq, wnj fvi Kvc, Mhm Kvc, KwvcP, AwdKvb gv, i BZ`w` Pvl`thwM" gvQ wej`k t_tK Avg`mb Kiv ntqtQ| cŃB eq`c AwdKvb gv, i mePK|



cvVvEi gj`iqb 1.3

mWk DEti i cvk Wk (✓) wPy w b|

1/ tKvbW mvgv`K gvQ?

- K) iB
- L) wPZj
- M) ifcPuv
- N) AvBi

2/ tKvbW `r`ycmbi gvQ?

- K) tKvij
- L) evUv
- M) tFUKx
- N) jBU`v

3/ KvZj v gvQ cKwZtZ mvari YZ Kx Lvq?

- K) dvBtUv cvWUb
- L) Ry cvWUb
- M) cPbkxj `Re c`v`L`
- N) KxUcZ½

4/ cWZ Mg `nK IRtbi Rb` iB gvQ Kx cwi gvY wWg w`tZ cvti?

- K) 200wU
- L) 300wU
- M) 400wU
- N) 100wU

5/ KZ eqtm wj fvi Kvc`cRbb`lg nq?

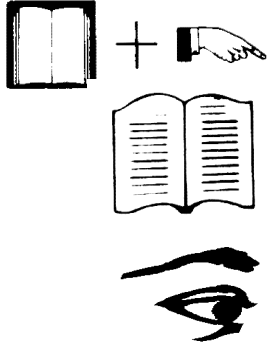
- K) 1 - 1.5 eQi
- L) 1.5 - 2 eQi
- M) 2 - 3 eQi
- N) 3 - 4 eQi

e'enwiK

cW 1.4 iB RvZiq gvQ Ges uPsnwi t`tni weifbæAsk kbr³KiY I uPwYZKiY

G cW tkI AvciB

- iB gvQwi t`tni weifbæAsk uPwYZ I kbr³ KiZ cviæb|
- uPsnwi t`tni weifbæAsk uPwYZ I kbr³ KiZ cviæb|



cVvjxt ubtPi uPtuU fij fite t`Lly Ges tm tgvZvteK iB RvZiq gvQwi Qwe GtK t`tni weifbæAsk uPwYZ I kbr³ KiB|

uPtu 11 t iB

cVvjxt ubtPi uPtuU fij fite t`Lly Ges tm tgvZvteK GKtu uPsnwi t`tni Qwe GtK weifbæAsk uPwYZ I kbr³ KiB|



uPtu 12 t Mj`v uPsnwi



Povšgji`iqb

msuŋB I iPbvji-K ckae

- 1| gvQ Pti I Biznm eYŋv Ki ly|
- 2| ersj vt`tk gvQ Pti i , i ŋ; Avtj vPbv Ki ly|
- 3| gvŋQi tkYweb`im ij Lly|
- 4| ersj vt`tki ugVv cmb I tj vbv cmbi gvŋQi Zvij Kv w` b|
- 5| ersj vt`tki A_ŋwZK , i ŋ; m=úbaŋvtQi Zvij Kv w` b|
- 6| ersj vt`tk Pti lvcŋhMx t`kx I weŋ`kx gvŋQi cmi iPwZ eYŋv Ki ly|



DĚigjv

cW 1.1

- 1| K 2| L 3| M 4| L

cW 1.2

- 1| N 2| L 3| K 4| M

cW 1.3

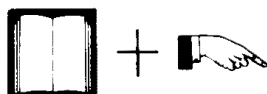
- 1| M 2| L 3| L 4| K 5| M

BDubU 2 cKz cOZKiY

mdj frte gvQ Pvl Kivi Rb h_vh_frte cKz cOZKiY AZ"sl , iZcYf grfQi Drcv`b
ewx cKz cOZKiYi Ici AtbKvstk wbfPkij | cKz cOzi Rb cKzi i`vb ubePb,
gmUj , Yv, Y, cKz ms`vi, cwb mieivn, cwb ub@vkb, AvMvOv cui`vi, ivfjzm I AemAZ
gvQ `gb, Pz cOqM, mvi cOqM BZ`m Kivfug m=ubakiZ nq|

G BDubU gvQ Pvl i Rb cKzi i`vb ubePb I gmUj , Yv, Y ubYq, cwb i Dm iPrYzKiY,
mieivn I ub@vkb cOq, cKz ms`vi I e`e`rcbv, Av`k`cKz ev Rj vktqi`enkO, cKzi
cuf=ui mivrt`h evqmieivn cOq, MvVubK wfiEz cKzi i tkYweb`vm I MVtbi ubqgejx
m=utK`e`m i Z Avtj vPbv Kiv ntqfQ|

cW 2.1 gvQ Pvl i Rb cKzi i`vb ubePb I gmUj , Yv, Y ubYq



G cW tkfI AvciB –

- cKzi i`vb Krfite ubePb KiZ nq Zv e`vL`v KiZ cvi`teb|
- cKzi i gmUj , Yv, Y Krfite ubYq KiZ nq Zv RibtZ cvi`teb|



cKz ubgpb nt`Q GKU metPtq , iZcYKvR hv GKrb m=te` grm`Pvix metPtq
cKzi i Ae`vb Ges gmUj , Yv, Y gvQ Pvl mdj Zv ev e`Zv ubaif`Y e`rcK figKv cij b
Kti | AchfB cwb mieivn Ges mvjvK mstkd`tbi Rb` AcZz Avtjv cKzi i`vb ubePtbi
`b`Zv cKk Kti | Z`gm AbyP Dcvi`li Ges Kg cwb aviY fJgzv gvQ Pvl i mdj Zv
Rb` cOzeUKZv m=up Kti `vtK|

cKzi i`vb ubePb

cKzi i`vb ubePtbi mgq ub=ij m LZ melq, tjv Aek`B wetePbv KiZ nte|

cKz ubgvy Kiv GKrb
m=te` grm`Pvix metPtq
, iZcYKvR | cKzi i
Ae`vb Ges gmUj , Yv, Y
gvQ Pvl mdj Zv ev
e`Zv ubaif`Y e`rcK
figKv cij b Kti |

- 1) cOtgB t`Ltz nte, th gmUz cKz Lbb Kiv nte Zvi cwb aviY fJgzv tenk`WK bv
hvz cwb i Pqvtrv Rubz fJmZ Kg nq|
- 2) cKzi i`vb Ggb RvqMvq nI qv DvPZ hv tgvUgyj Ggb t`ti `vtK thLv t`tK mntRB
cwb ub@vkb Kiv thz cvi`ti |
- 3) cv`tii bbygg GjvKvq A`ev thLv`b wcaovi ev DBtqi evmv AvtQ Ggb RvqMvq cKz
Lbb Kiv mK bq | Gfj RvqMvq cwb ati ivLv m=te nq bv |
- 4) cKz Lbtbi cte`GKRb `f cOskjx oviv H`vtbi cY% Rixc Kiv Avek`K | GRb`
H`vtbi wvfbeRvqMvq 2 wglvi MZ`Kti wvfbe`t`ii gmUj bglv mSMb Kti cixfjv
vixfv KiZ nte|
- 5) ubPzGjvKvq Lp mntR fvj cKz `Zvi Kiv hvq mKš Gfj RvqMv t`tK cwb ub@vkb
KvWb ntq cto|
- 6) cKz Ggb t`vb Lbb Kiv DvPZ thLv`b cwb i `vqx Dm w`gvb|
- 7) cKzi i`vb eb`vgj ntZ nte|

8) hw` mæ nq Zvntj gwj tKi emoi KvQvKwQ cKz Lbb Kiv DvPZ| hw` emo t_tK
AþK`ti nq Zvntj gvQ Pwi nl qvi ht_ó SxK_vtK|

9) cKzi i cmbtZ Qvqv cotZ cvti Ggb RvqMvq cKzi i`vb ubePb Kiv DvPZ bq|

AvqZvKvi cKz DEi
`wjtY j æ ntj gvQ
Pvtli Rb` fij |

mvavi Yfvte AvqZvKvi cKz DEi `wjtY j æ ntZ nte hvi dtj cKzi mhjtYK tenk cwi gvY
cote|

gvQti cKz Lbb cwi Kí bv Kvtj ubtPi avcmg n AbgyiY KivevÁbvq

K) cÚtg H AÁtj i fvg Rixc KitZ nte| GRb` H`vtb 2 wgvUvi MZ©Kti wevfbe`ti i
gvUvi bgyv mSMh Kti Zv wektY KitZ nte|

L) ewYvR`K DtítK` cKz Lbb Kitj fij iv`li cvtk Ges evRtíi KvQ`vb ubePb
Kivi AþK mjev i tqQ|

gvUvi MVb wektY

Kv`v ev GtUj I t`vAvk
gvUvi wgvYB cKz
Lbtbi Rb` Av`k@gvU|

Kv`v ev GtUj I t`vAvk gvUvi wgvYB cKz Lbtbi Rb` Av`k@gvU| G gvUvi cmb avi Y
¶lgZv tenk, cmb Pqvbtv tiva Kti Ges cvUub I tebt_vm Drcv`tbi Rb` cwp mgx cwi tek
mjo Kti | ewj gvUvi w`h` nq Ges cmb avi Y ¶lgZv LvB Kg Ges i ayGtUj gvUvi Abgy` nq
Ges tNvj vZj mjo Kti |

AvtMB ejv ntqtQ th gvUvi cÚZvU`ti i gvQ Pvtli DcthvMZv cix¶lv ubix¶lv KitZ nte|
wevfbe`vte GvU Kiv thtZ cvti | thgb wevfbe`li t_tK gvUvi bgyv mSMh Kti ej`Zwi Kti
t`Lv thtZ cvti | hw` ejvU Lv fij fite RgvU evta Zvntj eStZ nte gvUvtZ chvB Kv`v
AvtQ Ges Dvvi cmb avi Y ¶lgZv fij nte| ejvU hw` tdtU hvq A`ev tft½ hvq Zvntj
eStZ nte th Dvvi`Yv`Y Kg fij ev fij bq| G cix¶lv hv` wmxvstbqv bv hvq Zvntj
bZb fite GKgtv gvUvi ubtq Dvvi cmbtZ wRvtZ nte hvZ Dvvi wQv Avvtj v nq| Gevi k³
Kti nvZ w`tq DvvtK mstKvPb KitZ nte Ges Zvici Pvc Aeg` KitZ nte| hw` gvU
nvZi AvKvi ati ivLZ cvti Zvntj eStZ nte th DvvtZ chvB Kv`v AvtQ| hw` Zv bv nq
Zvntj eStZ nte DvvtZ ewj i cwi gvY tenk AvtQ|

gvUvi wekt MVb fij fite Rvvi Rb` GKgtv gvUvi ubtq Dvvi cmb w`tq tRvtZ nte Ges 15
tm.wg. j æ AvKvti i tMj vKvi`tÚi gZ`Zwi KitZ nte| hw` AvKvi ati ivLZ bv cvti
Zvntj eStZ nte Bvvi tenk ewj hv` gvUvi hv gvQ Pvtli Rb` AbgtvMx| hw` AvKvi ati
ivLZ cvti Zvntj GtK evKv Kti Aae`Zwi KitZ nte| hw` Avcwb GvUvi KitZ mg`bv
nb Zvntj Dvvi t`vAvk gvUvi | hw` Aae`Zwi nq Zte cy`e`Zwi Kivi tPov KitZ nte|
hw` cy`e`Zwi bv nq eStZ nte Dvvi fvix t`vAvk, hw` Dvvi tdvU hvq Zvntj nvj Kv`K`g,
(light clay) hw` tdvU bv hvq Zvntj K`g| Kv`v gvUvi cmbi avi Y ¶lgZv metPtq tenk wKs`
t`vAvk gvUvi tenk DeP|

MZ©Zwi Kivi ci gvUvi`Yv`Y cix¶lv ubix¶lv ntq tMj mKvtj cmb`jiv cy`KitZ nte|
mvi w`tb th cwi gvY cmb Pqvbtv Ges ev`uxfetbi Rb` Ktg tMtQ Zv mU`vKvtj bZb cmb
w`tq cy`KitZ nte| Gevi XvKbv ev cvZvh` MvtQi Wj w`tq MtZP glv tXtK w`b| hw`
tenki fivM cmb ciw`b mKvj chšMvtZ`vtK Zvntj H gvUvi cKz Lbtbi KvR e`envi Kiv
hvte|



Abloyb (Activity) : aily, Avcub Avcbvi emoi migtb gvQ Prtli Rb GKul ckyz Lbb Kivi K_v fvetQb/ H vftbi gml gvQ Prtli DcthmK bv Zv Kxfvte hvPvB Kiteb eVLv Kily/

gml i imiqbK`enkó` vetkly

p^H - gml p^H µg vetkly Kti gml mvariYZ Agiq, qvixq ev ckgZv Rvbr hvq/ gml p^H 4 Gi Kg Ges 11 Gi tewk ntj Dnv gvQ Prtli ckyz ubgfyi Rb` AthvM` weteWPZ nte/ gml p^H 6.5-8.5 ntj metPtq fij/ ckyzi Zjvi gml p^H gvb Rvbrvi ci ckyzi Pz c0qvMti gvlv wbyq Kiv hvq/ GKfvm gmlZ `y fvm cmlZZ cmb wgnkZ Kti wj Ugym KvmR ev p^H wglvi w`tq Dnvi p^H wbyq Kiv hvq/

gml p^H 6.5-8.5 ntj gvQ Prtli ckyz Lbtbi Rb` metPtq fij /

dmtdU

ckzyi gmlZ mvgv` gvlvq dmtdU_vktj fij nq/ gmlZ dmtdU Ave× Ae`vq br t_k e`envi thvM` Ae`vq_vktZ nte/ gml cixqvi Rb` gwEKv cixqy wku (Soil testing kit) e`envi Kti dmtdUi cwi gvY wbyq Kiv hvq/

bvBtUtRb

ckzyi cwi wgz cwi gvY bvBtUtRb_vktj gvQti Drcv`b fij nq/ ckyzi gmlZ th`Re c`v`_vK, e`vktUvi qv G`Re c`v`_qf½ w`tq Avtgmbqv bvBtUtRb` Zwi Kti / Avtgmbqv t_k e`vktUvi qvi wqv dTj bvBUU Ges cti bvBtUtRb Drcbwnq/ bvBtUtRb dvBtUvcwUub Drcv`tbi Rb``iKvi nq/ e`envi thvM` bvBtUtRb (bvBtUtRb) tewk_vktj gvQti Drcv`b fij nte/ Soil testing kit w`tq bvBtUtRbtbi cwi gvY wbyq Kiv hvq/

ckzyi gmlZ cwi wgz bvBtUtRb_vktj gvQti Drcv`b fij nq/

cUmkqg

dvBtUvcwUub Drcv`tbi Rb` gmlZ c0qvRbgZ cUmkqg_vktZ nte/ gmlZ wK cwi gvY cUmkqg AvtQ Zv Soil testing kit e`envi Kti wbyq Kiv hvq/



mvi gg th gml cwb aviY qgzv tewk tm gmlZB ckyz Lbb Kiv DvPZ/ gvQ Prtli ckyz ebv g`v`v`b ntZ nte/ tetj gml wQ`hy nq Ges Gi cwb aviY qgzv Kg/ GKfvm gmlZ`qfvm cmlZZ cmb wgnkZ Kti wj Ugym KvmR ev p^H wglvi w`tq H gml p^H wbyq Kiv hvq/ Soil testing kit w`tq gmlZ w`v`g dmtdU, bvBtUtRb Ges cUmkqgtgi cwi gvY wbyq Kiv hvq/



cuVvEi gj`iqb 2.1

miWK DEti i cuK uJK iPy (✓) i b|

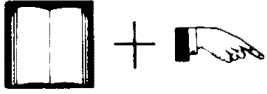
- 1/ tKvb&`ib cKz ubg#Yi Rb` Dc#hMx?
 thLvfb gnu Kvkii h#
 thLvfb Mfxi gj-h# MQcvj v AvtQ
 thLvfb mcaovi iKwe AvtQ
 thLvfb ch#B Avtj v evZim AvtQ Ges gnu t`uAvk I Kv`vi ugkY

- 2/ gnu cmbtZ wfiRtq tMij vKvi `tUi gZ Kti DnivK evkv Kti eEivKvi Kiv tMtj
Dnv tKvb&ai#bi gnu ubt`R Kti?
 Kv`vgnu
 t`uAvk gnu
 tetj gnu
 nij Kv t`uAvk gnu

- 3/ gnu i p^H ubYq Kivi Rb` th `eY `Zwi Kiv nq DnivZ gnu I cmbi AbgvZ KZ?
 1:1
 1:2
 1:3
 1:4

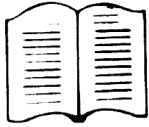
- 4/ cKzi gnu tZ th `Re c`v`_`vK Zv t`K tKvb u Avtgnbqv bivtUtRb `Zwi
Kti?
 cuUub
 fiBim
 e`vKtUwi qv
 Gj uR

cW 2.2 cubi Drm wPnyZKiY, mieivn I ub@vkb cġuqv



G cW tkłI Avciġ –

- cġzi cmb mieivni Drmmgr-eYġv KiłZ cviġeb|
- Kxfiġe cġzi cmb mieivn Kiv nq Zv eYġv KiłZ cviġeb|
- cġzi i cmb Kxfiġe ub@vkb Kiv nq Zv RvbtZ cviġeb|



mdj fiġe cġz cġZ Kivi Rb" chvġ cmb mieivn ubiġZ Kiv AZ"šġ iġcyġ bZb LbbKZ.cġz cmbłZ fuzKiv Qvovl Pqvtbv I ev@uxFebRvbZ cmb NvUvZ cġY Kivi Rb" cmb mieivn ubiġZ KiłZ nq| ev@uxFebġi gvaġg cmb metPtq tenk Kġg hvq MġšKvtj | KvġRB cġzi i ĩvb ubePġbi mgq cubi ubfPġthvM" Drm AvtQ wK bv Zv ubiġZ KiłZ nġe|

MġšKvtj cġz hvġZ cmb kY" bv nq tm Rb" chvġ cubi e"e"v vKv Avek"K| mvari Yfiġe mviv eQiB cġz cmbłZ cY"vKłZ nġe| GKBfiġe AvZvi" cmb hvġZ cġzi i ġvZ KiłZ bv cvġi tm w"tkI bRi w"łZ nġe A"ġ cmb ub@vkb i e"e"v ivłZ nġe|

cubi Drm

mvariYZ SYġ, ĩvqx b"x, Dcb"x, f, ĩġi i Dci w"łq cġvnnZ epġi cubi Drm łtk cġzi cmb mieivn Kiv nġq vġK|

łKvb SYġ gġLi ubKłU cġz Lbb Kiłj Dnv SYġ cmb ġviv cY"nq| Drm wntmġe SYġ mġeav GB th Dnv łtk GZ tenk cmb cġzi Avġm bv hvġZ cġz c- meZ nġ qvi fq vġK| KvġRB cmb mieivni Drm wntmġe SYġLġB ubfPġthvM" | mZi is cġz Lbtbi ĩvb ubePġbi mgq cġłg SYġAbvġvb Kiv DvPZ|

b"x I Dcb"x cmb mieivni Dchġ Drm wntmġe e"e"Z nġZ cvġi |

b"x I Dcb"x cmb mieivni Dchġ Drm wntmġe e"e"Z nġZ cvġi | AłbK b"xłZ mviv eQi cmb vġK Ges tmLvtb cmb mieivni łKvb weNemġo nq bv| Avevi AłbK b"x MġšKvtj bve"Zv nwiłq łđġj ev i"wkłq hvq| tm ġġłġ i Kłbv tgšmġg, hLb cġz i"wkłq hvevi fq vġK ZLb cmb cvġ qv hvq bv| ZvB b"xłK cġzi cmb mieivni Drm wntmġe wPnyZ Kiłj b"xi bve"Zvi w" Kiv Aek" B weġPbvq AvbtZ nġe|

cmbi łKvb KivRi Drłmi DcwiłZ Qvovl fij cġz "Zvi Kiv thłZ cvġi | G mg"łcġzłK AłbK mgq ġAvKiv cġzġl ejv nq| Kvi Y Gme cġz epġi cmb ġviv cY"nq ev Gme cġzi cmb mieivn AvKvġki Dci ubfPġkxj | eisj vġtki tenki fivM cġzB Gi AvłZvq cġo| iagvġ epġi cmb thLvtb cubi Drm wntmġe e"e"Z nġe tmLvtb cmb mieivn I LubKvi ġcmbi łkłWiġ I ci ubfP Kłi | cġzi i Pvi w"łK th gġvġj ev mgZj fivg łtk epġi cmb Mvotq cġzi cġo tm Aġj łK cubi łkW ejv nq| cubi łkW tenk eo nġj fvi x epġcvġi mgq cġz cmeZ nġ qvi mġebv vġK|

eisj vġtk GK GK i Rj vqZb wekó cġzi cwi ngZ cwi gvġY cmb mieivni Rb" 5 łtk 10 GK i AvqZłbi cubi łkW ivłZ nġe| cubi łkW hv" eġlgg nq Zvntj łkłWi AvqZb tenk nġe| cubi cwi gvġY Kg ev tenk nġj Avġj teta cubi w"K cwi eZB Kłi cġzi i cubi cwi gvġY ubqšġ Kiv hvq|

emYUR`K grm` Lvgf`i
eZgvtb Mfxi ev AMfxi
bj Kc e`envi Kti cjkzi
fMF` cmb mieivn Kiv
nq|



Dtj mLZ cŠv Qvovl b`x ev n` nž cvt`úi mnvth` cmb DtEij b Kti cjkz cY`Kiv hvq|
emYUR`K grm` Lvgf`i eZgvtb Mfxi ev AMfxi bj Kc e`envi Kti cjkzi fMF` cmb
mieivn Kiv nq| fMF` cmb DtEij tbi Zžbvq eo tKvb Rj vkq t`_tK cvt`úi mnvth` cmb
m`lq mSMh Kiv hvq| thLvfb me`yr mieivn AvtQ tmLvfb mWtRj BwAtbi cwi etZ` me`yr
Pvj Z cvt`ú e`envi Kiv mjeavRbK|

Ablyj b (Activity) t aly, Avcbvi GKU cjkz AvtQ| cjkzUtz cmbi cwi gvY mWk gv`vi
Zžbvq AtbK Ktg mWtqtQ| GgZve`lq H cjkzi cmbi cwi gvY Kx Kx Dcvtq Ablyj gv`lq
DbwZ Ki teb Zv wj Lb (Ably`100 kã)|

cmb mieivni cwi gvY

ev`úFeb I Pqvfbvi Rb` th cwi gvY cmb Ktg hvq Zv Ges AvsukK ev cY`Lwvj Kivi ci
ci-Y Kivi Rb` th cwi gvY cmbi c`qvRb nq DnvB nt`Q me`b`ecwi gvYi cmb mieivn|
cmb miivni gva`tg cjkzi Av` tRb msthvRb Kiv nq| c`KwZK Dm t`_tK cmb mieivn
Kij cmbi mvt` mKQymKQygv`Qi Lvevi I cjkzi Avtm| Avevi AtbK mgq ubveo Pvl c`xwZ
c`qvM Kij cjkzi i cmb `wZ nlqvi m`vebv`_vtK Ges gv`S gv`S cmb cwi eZ` Kivi
`i Kiv nq|

cmb mieivn I ub`vkb c`qv

cjkzi cmb mieivn I ub`vktbi Rb` 2w c`xwZ AbyiY Kiv ntq`_vtK- úBm I gsk
(Monk) |

úBP cjkzi i cvtoi GKU Awet`Q` Ask wntmte`Zwi Kiv nq| GuU` wj cikvcnk mgvš ivj
c`Pxi wbtq MWZ|

gsk cjkzi i cvtoi mvgtb`_vcb Kiv nq| GuU` wj cikvcnk I mgvšij c`Pxi I GKU
tcQtbi c`Pxi w`tq MWZ| cKZ.c`f` wj wntóg c`q GKB i Kg|

cjkzi cmb mieivni
Rb` AštMgx biv vi
(Inlet) e`e`v`_vKv
c`qvRb|

cjkzi cmb mieivn Kivi Rb` AštMgx biv vi (Inlet) e`e`v`_vKtZ nte| cjkzi AštMgx
biv v`_vctbi c`e`v`waj mLZ w`lq mgr` Aek`B wetePbvq AvbtZ nte t

- 1) w`bqvZ I w`bqvšZ fite cmb mieivn w`vDZ Kiv
- 2) cjkz t`_tK gv`Qi cv`vq tiva Kiv
- 3) Aem`AZ c`Rwzi gv`Qi cjkzi c`ek i wZKiY

cmb mieivn biv v (Water inlet)

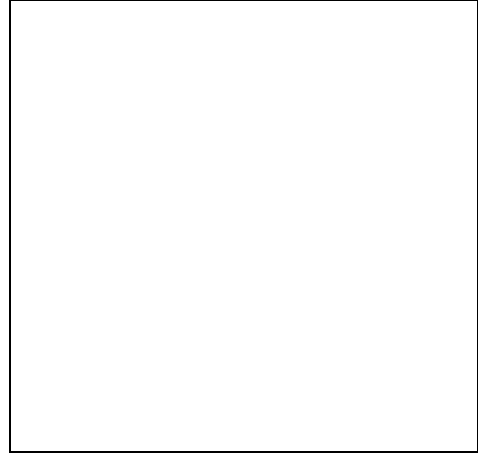
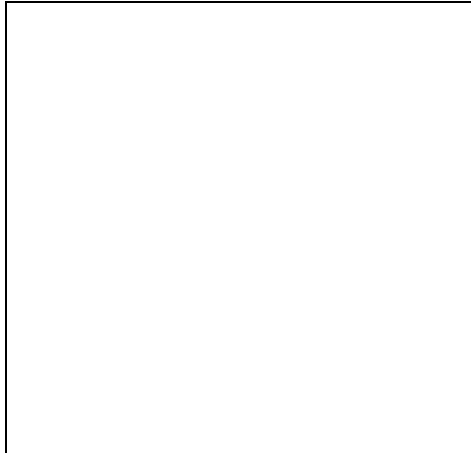
c`ZwU cjkzi i Rb` Avj v`v Avj v`v cmb mieivnKiv ev AštMgx biv v`_vKtZ cvti A`ev
AvšmsthvM AvtQ Gi Kg KtqKU cjkzi i Rb` GKU mvari Y biv v`_vKtZ cvti |

cjkzi w`bqvZ I w`bqvšZ fite cmb mieivn w`vDZ Kivi Rb` GKU Dj`úBm`Zwi Kiv nq
ev emvtr nq| Gi GKU avZe nvZj`_vtK hvi D`PZv w`bqvšY Kiv hvq (wP` 13)| Lvtr
emvtr hvte Ges c`qvRtb DVbvqv Kitz cvti Gi Kg w`vfbv`ai`Yi tevW`e`envi Kiv thtZ
cvti | Lvov úBtmi w`bP A`ev w`bPi tevW`P Zj`vq GKU tLvj`vgy` ivLtz nte hvi w`fZi w`tq
cmb c`qvRbvq MWtZ Ges c`qvRbvq cwi gvY cjkzi c`ek Kitz cvti | cjkz t`_tK gv`Qi
cv`vq Ges c`kti Aem`AZ gv`Q c`ek eU Kivi Rb` GKU Wvš`Avb`v`gK k³ Pj w`b emvtr

Kul.1 cj#Dbqbb`z

ckzi ubqigZ l
ubqisfite cwb mieivn
ubwDZ Kivi Rb" GKiu
Dj aubm`Zwi Kiv nq|

nq (uP1 14)|`u Lvov c0Pri`Zwi Kti GB Pij ub emivbnq| Pij ubiUtk cwbZ Wietq
ivLvi Rb" cwb mieivnKvix P'vbtj i Ašiteix biv i KvQvKwQ GKiu eta`Zwi KitZ nte|
evtai D"PZvi Pij ubi D"PZvi tPtq mvgvb" teik nte| evta gaj v/AveR0v Rtg tMtj Zv gvtS
gvtS cwi@vi KitZ nte|



uP1 13 t ubm

uP1 14 t WzšlAvbfugK Pij ub

cwb ub@vkb

cwb ub@vkb Kivi e'e`v ckzi i cvtoi Zj t tk cvtoi`N° chšfite`Z.GKiu AvbfugK
biv v Ges gsk ubtq MWZ| gsk Pri tKivvKuz. Ges 30 tm.ug. Pl or (uP1 15)| gsk i`N°
cwb i D"PZvi Kgctq 40 tm.ug. Dci chšfite nte| Pij ub Ges teW°emivbri Rb" cvtkP
Lvov c0Pti 2-3iu LUR`Zwi Kiv nq| GKiu Pij ubi Rb" Ges 2iu`gaitbi teW°P Rb"|

thLvfb gsk`vcb Kiv nte tmLvbkvi gnu Ly fij fite`ygyr (Ram) KitZ nq| cti
KspuxU wfiEi Dci gsk`vcb KitZ nte|

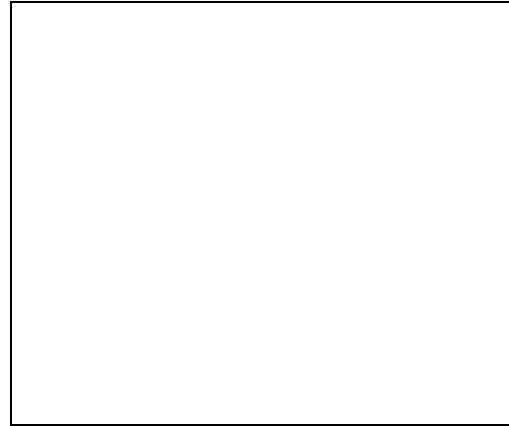
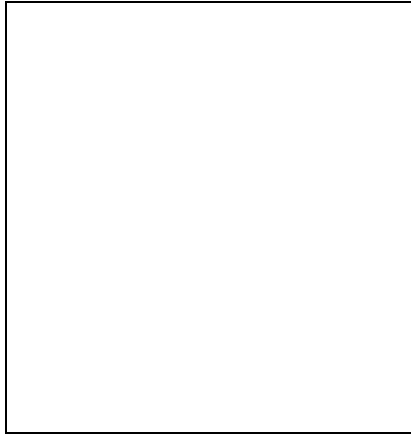
gsk i`agv1 Dctii Ask cvtoi Dctii Astki mvgtb`vKte hvZ gsk i ubtPi teiki
fiv Ask cvto 0viv AveZ ev tNiv`vtK| ckzi i cvofvzv gnuZ gsk i emni c_ hvZ
evavM0'bv nq tmRb" `u cq]-m`k c0Pri ZxhR fite`Zwi KitZ nte| (uP1 16)

gsk MxU menxb k3 KvV
0viv`Zwi Kiv thZ
cvti | 4-5 tm.ug. cyZj
mabz3v w`tq Dnv
`Zwi Kiv hvq|

gsk MxU menxb k3 KvV 0viv`Zwi Kiv thZ cvti | 4-5 tm.ug. cyZj mabz3v w`tq Dnv
`Zwi Kiv hvq| mivavi YZ KspuxU w`tq gsk`Zwi Kiv nq| KspuxU 0viv gsk`Zwi KitZ ntj
Giu LyB gReZ KitZ nte Ges cvk,c0Pti "U" AvKuzi tjvri iW w`tq LUR`Zwi KitZ
nte| gvtQi cij vtvv tiva Kivi Rb" GKiu Pij ub c0g LvR emivZ nq| Pij ub gaj v/AveR0v
0viv eU nte tMtj gvtS gvtS cwi@vi KitZ nte|

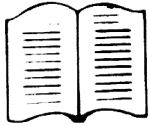
GK ev`gaitbi teW°emivbri thZ cvti | ckz hiv`epoi cwbZ fivZ`vtK Ges GB cwb hiv
ckzi ati ivLvi c0qvRb nq Zintj dlvri ga`w`tq`u teW°P ga'eZi°-vb cwb ubM0b
Goitvri Rb" Kv`v w`tq fivZ°Kti t`qv nq|

ckzi cwb mieivnKvix Ges w@vkbKvix byjv Ges gštKi MVb GKB| i'aycv`R` GB th
mi ivnKvix cvtoi Dctii w`tK Ges w@vkbKvix gsK cvtoi Zj t`tk `vcb Kiv nq|



wPĪ 15 t gsK

wPĪ 16 t cŋ| m`k ZxhR cŋPxi



mvi gg MŋSkvtj er`úxfetbi gva`tg ckzi i cwb metPtq tenk Ktg hvq| MŋSkvtj ckz
hvZ cwb kb` bv nq tm Rb` chŋB cwb i e`e`v`v`Kv Avek`K| maviYZ SYŋ, `vqx b`x,
Dcb`x, f,`t`ii Dci w`tq cĕwnZ epoi cwb i Drm t`tK ckzi cwb mieivn Kiv nq|
ckzi cwb mieivn I w@vktbi Rb` 2wU c×wZ AbyiY Kiv nq `vK- úŋm I gsK|
cŋZ`KwU ckzi i Rb` Avj v`v Avj v`v cwb mieivnKvix byjv `vKtZ cvti |



civvĒi gj'iqb 2.2

mĪK DĒti i civk ĪJK ĪPý (✓) ĩ b|

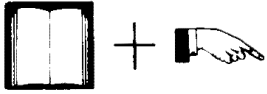
- 1/ **cĵzi cmbi mieivnKvix ĩntmte tKvb&DrmiU tewk ĩbfPthvM?**
 b`x
 SYP
 Dc-b`x
 eĵi cmb

- 2/ **ıgvUıgvU fıte evsj v`tk GKıU GK GKı cĵzi cmb mieivni Rb` cmbi tkıWi AvqZb KZ nte?**
 5-10 GKı
 10-15 GKı
 15-20 GKı
 2-5 GKı

- 3/ **cāvb ĩK KviıY cmb mieivnKvix I ĩb®ıkbKvix bıj vq Pıj ĩb e`envi Kiv nq?**
 cĵzi hvıZ gıj v/AveRĐv XKıZ bı cvıi
 cĵzi hvıZ KPıı cvbv cĵek KııZ bı cvıi
 cĵzi hvıZ AemĀZ gvQ cĵek KııZ bı cvıi Ges cĵz t_ıK hvıZ gvQ bı cij vıZ cvıi
 cĵz t_ıK gvıQi Lv` hvıZ temotq bı thıZ cvıi |

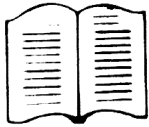
- 4/ **gsK KZUKıPI ov nı qv DıPZ?**
 10 ĩm.ıg.
 15 ĩm.ıg.
 20 ĩm.ıg.
 30 ĩm.ıg.

cW 2.3 cKz ms`vi I e`e`icbv, Av`k@cKz ev Rjiktqi `enkó, cKzi ctf`úi mrvth` evqynieim cKiqv



G cW tkłI AvciB –

- cKz Kxfite ms`vi I e`e`icbv KiłZ nq Zv RvbłZ cviłeb|
- GKıU Av`k@cKzi i`enkó`mgn`eYbV KiłZ cviłeb|
- ctf`úi mrvth` Kxfite cKzi evqynieim Kiv nq Zv eYbV KiłZ cviłeb|



th tKvb hšłK mPj iVlvi Rb` DnvtK fij fite i`Yvte`Y KiłZ nq Ges gvłS gvłS Zv tgvłZ KiłZ nq| tZgıB cKz GKevi Lbb KtiB DnvtZ mrvRxb GKbFite gvQ Pvl Kiv hıte GgbıU fiev wK bq| ZvB gvQ Pvl i cKz hłZé mvt_ i`Yvte`Y KiłZ nq Ges gvłS gvłS ms`vi KiłZ nq|

cKz tkB ms`vi Kiłeb

tKvb KviłY hı cKz gvQ Pvl i AbzthıMx nłq cto Zvntj cKzłK ms`vi KiłZ nte| thgb - cKzi i cvo łftł thłZ cvił ev Bıj,KvKov BZ`w` MZ`Kti cvotK`gP Kti włZ cvił| Avevi wefbae KviłY cKzi i Zjł`tk AvZwi³ cıj cto ev`Re c`v`Rtg cKz fivU nłq gvQ Pvl i AbzthıMx nłZ cvił| wefbaeRj R AvMvOv RbłZ cKz KivRvixZv nviłZ cvił| G mg`ıAmıear`ı Kti cKzłK gvQ PvlıvctıMx Ae`ıq vđti Avbri Rb`B cKz ms`vi AZ`sıRijı|

Rj R AvMvOv RbłZbvi
KviłY cKzi i KivRvixZv
bó nłZ cvił|

Kxfite cKz ms`vi Kiłeb

cKz ms`vıı KivıU i`ı tgšmıg m`úbacıłZ nte| Mı`Skvıj cKz AvcbłZ i`ıKtq tMıj fij, bv nıj ctf`úi mrvth` i`ıKtq tđj łZ nte|

cKzi i Kiv`v i`ıKtq tgvUıgvU k³ nıj H Kiv`v tKłUB cKzi i cvo cbıbgıP Kiv hıte| Gfite cKzi i AvZwi³ Kiv`vı AcmııZ nte| cKzi i cııoi Xıj`ıv Ggb nłZ nte thb cııbi tıD tıM mntRB cKzi i cvo łftł bv hvq| cKz AMfıı nıj Mı`Skvıj cııb i`ıKtq hvq ev Ktg hvq| ZLb cKzi i Zjł`tkı Rj R AvMvOv RbłZ cvił| ZvB Kiv`v Acmııłbi mgq Zjł`tkı AvMvOvı (hıv`ıłK) AcmııZ nte| GfiteB cKz ms`vıı Kiv mntRB m`úbacıı hvq|

cKz AMfıı nıj
Mı`Skvıj cııb i`ıKtq hvq
ev Ktg hvq|

Av`k@cKzi i`enkó`

wbaj ıLZ`enkó` m`úbacKzłK Av`k@cKz ev v thłZ cvił|

AvıKıZ.(Shape) t Av`k@cKz nte AvqZıKvi |

AvıKvi t cKz Lı tOıU nte bv Avevi GZ eo nte bv thb e`e`icbv KiłZ Amıear nq|

cKzi i cııbi MfııZv
1.5 ł`łK 2 ıgUvi nıj
gvQ Pvl i mıearRbK nq|

cKzi i MfııZv t cKzi i MfııZv GZ Kg nte bv hıłZ m hıj vK Zjł`tk cıek Kti Rj R AvMvOvi mıó Kti Ges i`ı tgšmıg i`ıKtq hvq| cKzi i cııbi MfııZv 1.5 ł`łK 2 ıgUvi nıj gvQ Pvl i mıearRbK nq|

cııbi Zıvcıvıv t hıv`ı FZzcııeZłbi mvt_ mvt_ cııbi Zıvcıvıvı cıııewZł nq Zey j`ı` iVłłZ nte thb cııb teıK Mıg nıq gvıv bv hvq|

Kul. I cji Dbq b ǂ

A⁻QZv t GKU fij cǂzi i cmb cUUtbi Dcw⁻UZ ev cU⁰hZvi Rb⁻ A⁻Q nte uKŠ⁻ K⁻vi Rb⁻ A⁻Q ev tNvj v nte bv |

cǂzi chǂ mhǂj vK
cotj g⁰i Drcv⁻ b
fij nq |

A⁰tj v t cǂzi Ae⁻vb Ggb RvqMvq nI qv D⁰PZ thLv⁰b chǂ mhǂj vK cto | ZvQ⁰ov cǂzi i cmb KP⁰ c⁰bv ev Ab⁻ tK⁰v D⁰iv AveZ⁻ vKte bv h⁰tZ chǂ mhǂj vK cmbi wFZi c⁰etk m⁰vi m⁰ Ki⁰Z cv⁰i |

ǂ⁰xfZ Aw tRb t cǂzi i cmbtZ ǂ⁰xfZ Aw tR⁰bi c⁰igvY 5-10 u.c.u.c.Gg. Gi g⁰a⁻ vKte |

ǂ⁰xfZ KveǂWB A⁻ vBW t cmbtZ 6 u.c.u.c.Gg. Gi temk KveǂWB A⁻ vBW⁻ vKte bv |

tgU A⁻vj K⁻vj vbiU t cǂzi i A⁻vj K⁻vj vbiU 100-250 u.c.u.c.Gg. Gi gZ nte |

pH t cǂzi i cmbi pH 6.5 t⁻tK 9.0 Gi g⁰a⁻ vKte |

GQ⁰ov cǂzi i cmbtZ w⁰fb⁰e ǂ⁰xfZ K⁰v⁰b c⁻v⁰thgb- dmd⁰ivm, cU⁰m⁰q⁰vq, w⁰vj K⁰b, K⁻vj w⁰q⁰vq, g⁰M⁰t⁰w⁰q⁰vq, Av⁰q⁰b, m⁰vj d⁰vi BZ⁻ w⁰ c⁰igZ c⁰ig⁰vY⁻ vKte |

cǂzi eqymieivn

Av⁰g⁰iv R⁰w⁰b, g⁰i⁰ Drcv⁻ tbi Rb⁻ cmbtZ ǂ⁰xfZ Aw tRb⁻ i⁰z⁰c⁰v⁰f⁰ig⁰K⁰v⁰ cvj b K⁰i⁰ v⁰tK | t⁰mR⁰b⁰ tK⁰v⁰ K⁰v⁰i⁰Y h⁰ cǂzi ǂ⁰xfZ Aw tR⁰bi c⁰igvY K⁰g h⁰vq Ges g⁰v⁰ Ggb tK⁰v⁰ j⁰Y c⁰k⁰ K⁰i⁰ th D⁰v⁰iv Aw tRb⁻ t⁻Zvq f⁰M⁰t⁰ Zv⁰tj Ri⁰j⁰ w⁰f⁰EtZ cǂzi Aw tRb⁻ mieivn K⁰v⁰ c⁰q⁰v⁰Rb |

t⁰Kej g⁰v⁰ e⁻vcb c⁰u⁰q⁰vi g⁰v⁰tg cǂzi i cmbtZ ǂ⁰xfZ Aw tRb⁻ mieivn n⁰q v⁰tK | e⁻vcb⁰bi n⁰vi m⁰v⁰vi YZ w⁰Z⁰biU w⁰l⁰q⁰i D⁰ci w⁰b⁰f⁰K⁰vj t

1) cmbtZ Aw tR⁰bi g⁰v⁰v, 2) cmbi D⁰ci⁻ t⁰i Av⁰qZb h⁰v evq⁰v ms⁻utk⁰ v⁰tK, 3) cmbi Av⁰t⁻vj t⁰bi g⁰v⁰v

cmbi t⁻i⁰tK Av⁰t⁻vj Z
K⁰i⁰ cmbtZ Aw tR⁰bi
c⁰igvY evov⁰t⁰bv h⁰vq |

evqymieivnK⁰v⁰x h⁰tšj g⁰v⁰tg evq⁰l cmbi m⁰st⁰h⁰M t⁰q⁰t⁰ cmbi Av⁰t⁻vj t⁰bi g⁰v⁰v ev⁰x K⁰v⁰ nq h⁰vi dtj cmbtZ Aw tR⁰bi c⁰igvY ev⁰x cvq | w⁰Zb⁰f⁰v⁰te cmbi t⁻i⁰tK Av⁰t⁻vj Z K⁰v⁰ h⁰vq⁰t
1) c⁻w⁰t⁰vj ũBj A⁻v⁰i⁰U⁰t⁰i g⁰v⁰tg cmb w⁰Q⁰v⁰t⁰bv th⁰Z cv⁰i | 2) cv⁰t⁰u⁰i m⁰v⁰v⁰th⁰ cmb t⁻u⁰ K⁰v⁰ th⁰Z cv⁰i | 3) Ab⁻ tK⁰v⁰ f⁰v⁰te cmbtK b⁰vov⁰t⁰bv th⁰Z cv⁰i |

GQ⁰ov cmbi w⁰FZi e⁰v⁰e⁰y m⁰vi g⁰v⁰tg cmbtZ Aw tRb⁻ mieivn K⁰v⁰ h⁰vq | e⁰v⁰e⁰y cmbi t⁻i⁰ D⁰t⁰V G⁰tj e⁰v⁰e⁰y Ges cmbi m⁰st⁰h⁰M t⁻v⁰t⁰ Aw tRb⁻ ǂ⁰xfZ nq |



Ab⁰lvj b (Activity) t Av⁰cb⁰vi cǂzi i cmbtZ Aw tRb⁻ K⁰g t⁰M⁰tj Av⁰cb⁰ Z⁰v K⁰x⁰f⁰v⁰te e⁰steb Ges Aw tRb⁻ evov⁰vi Rb⁻ K⁰x Ki⁰teb Z⁰v vj L⁰v |

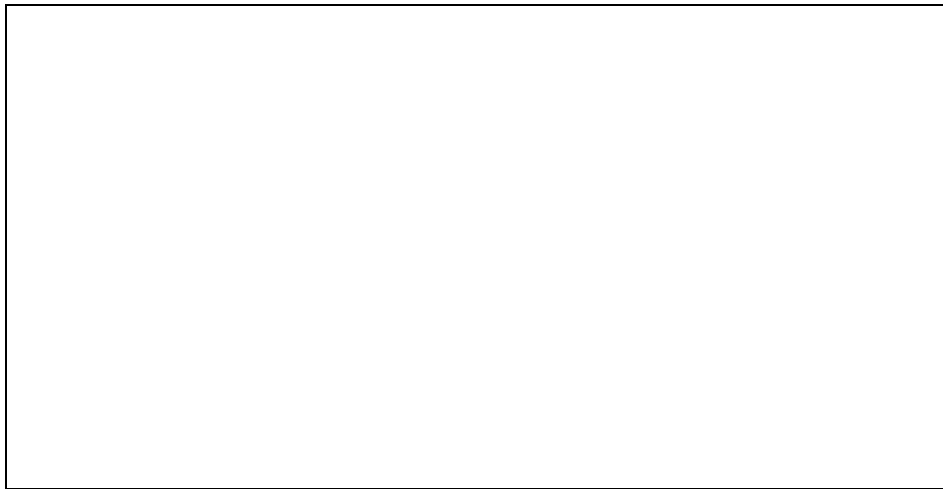
evqynieivnKvixhš;evtKškj Pvi aitbi ntZ cwti

gva`iKIŦ kw³tK KvR j wltq evqynieivn

gva`iKIŦ kw³i cŦvte th tKvb e`tK Dcti Qšjo w`tj wbtP cto hvq| hw` Dci t`tK cmb
wbtP cwZZ nq Zvntj evqycvmbi msthvM tŦŦ ewx cvte GB gj-bwzi Dci wŦwE Kti GB
c×wZ KvR Kti | thgb Rj cŦvZtK cŦKwZK A`vitiUi ev evqynieivnKvix ejv nq| hLb
Dci t`tK cmb wbtP cwZZ nq ZLb cmb ŦŦžªŦŦžªKYvq wef³ nq Ges Dnvt`i ms`útk®evqy
Gtj B cmbtZ `bxfZ nq|

c`vWj úBj A`vitiUi

c`vWj úBj A`vitiUi cmbtK evZvfm wQwUtg t`q Ges Dcwi`li tK Avf`wvZ Kti |
(wŦŦ 17 K I L)



wŦŦ 17 (K) t c`vWj úBj A`vitiUi

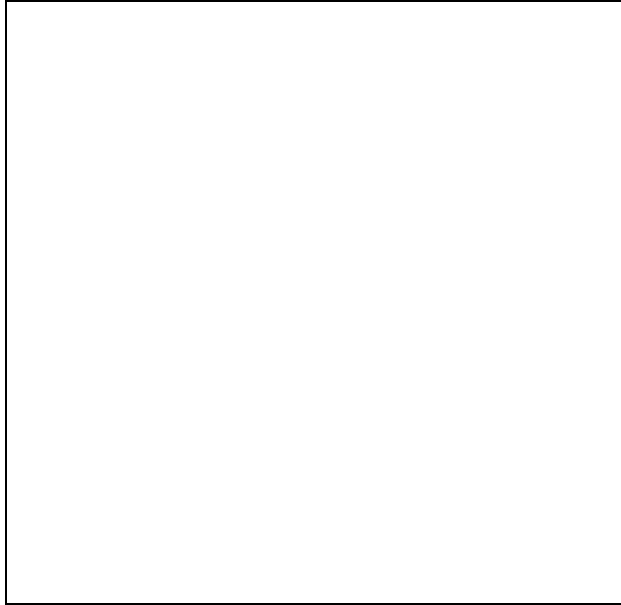


wŦŦ 17 (L) t Kvixhš;evtKškj c`vWj úBj A`vitiUi

Kul.1 cju Dbqb ֆ

ՄիւճՐՎի Ա՛վիՍի

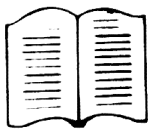
ՄիւճՐՎի Ա՛վիՍի Կմբի յԲԶի ԵՂԶԵՐ ԱԽ ԻՐԻԲԻ ԵյԵյ ԲԲԻՐԿԿԲ Ի՛Ղ | ԳԲԻԵ ՄԻՄԻԻ ԵՂԿԿԵԲԻԶ Ե՛ՒԲԶ ՆՂ | (ՄՒՒ 18)



ՄՒՒ 18 Ի ԵՂԿԿԵՐԱՍ (ՄիւճՐՎի Ա՛վիՍի)

ՍՎԻԵԲԲ Ա՛վիՍի

ՍՎԻԵԲԲ Ա՛վիՍի ԳԿԱՍ ԸԻՇՅՎԻԻ Ի ՄՆՎԻԻ՛ ԿԵԲԻԶ ՆԿԹ ՄԻՐՔ ԿԻԻ ԸԿԻ ԸԿԻ ԵՂԿԻԵԻՎՆ ԿԻԻ ՎԻԿ |



մվիցց ԻԿՅ ԿՎԻՎ ԽԻ՛ ԸԿԻ՛ ԳՎՔ ՔՐԻԻ ԱԲԾԻՎՄԻ ՆԻՂ ԸՐՈ ԶՆՎՅ ԸԿԻ՛ԻԿ ՄՍ՛ՎԻ ԿԻ՛Զ ՆՂ | ԸԿԻ՛ ՄՍ՛ՎԻԻ ԿՎՐԱՍ Ի՛՛ ԻԾՏՄԻԾ ԻՍՍԵԿԻ՛Զ ՆԵ | ՄԹՔՎԻՅ ԸԿԻ՛ ԱՐԿԵՒԻԶ ԿՂԿԻՂ ԻՄԻՅ ԲԻՅ, ԲՎ ՆՅ ԸՎԵՐԱՍԻ ՄՆՎԻԻ՛ Ի՛ՂԿԻՂ ԻՇՅԻԶ ՆԵ | ԱՎ՛Կ՘ԸԿԻ՛Ի ԿԵԲԻԶ Ե՛ՒԲԶ ԱԽ ԻՐԻԲԻ ԸՄԻԳՎ 5-10 ՄԸ.ՄԸ.ԳԳ. ՆՅ ԲԻՅ | ԱՎ՛Կ՘ԸԿԻ՛Ի ԿԵԲԻԶ Ե՛ՒԲԶ ԿՎԵՑ ՄՎԲ Ա՛ՎՄ 6 ՄԸ.ՄԸ.ԳԳ. ԳԻ ԻԵՂՔ ՎԿՎ ԸԻՔԶ ԲՂ | ԻԿԵՅԳՎԻ Ե՛ՐՅԲ ԸՄՂՎԻ ԳՐԱ՛Ծ ԸԿԻ՛Ի ԿԵԲԻԶ Ե՛ՒԲԶ ԱԽ ԻՐԲ ՄԻԵՎՆ ՆԻՂ ՎԻԿ | ՄՅԲԲԻԵ ԿԵԲԻ Ի՛Ի՛Կ ԱՎԻ՛ՎՅԻ Զ ԿԻՎ ԽՂ | ԻԾԳ Ը՛ՎՎՅ ԸՅԻՅ Ի ԳՐԱ՛Ծ ԿԵԲ ԽՈՒՎԻՂ, ԸՎԵՐԱՍԻ ՄՆՎԻԻ՛ ԿԵԲ Ի՛ՍՐՔԻԻ ԳԵՍ ԱԲ՛ ԻԿՅԲԻԵ ԿԵԲԻԿ ԲՎՐԻՅԻ ԳՐԱ՛Ծ |



civvEi gj`iqb 2.3

mivK DEti i civk iUK iPy (✓) i b|

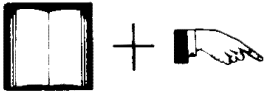
- 1/ cKz tKb ms`vi Ki teb?
 - K cKz tK gvQ Pvlvc thvMx Kivi Rb`
 - L cKzi i Mfxi Zv eix Kivi Rb`
 - M cKzi i AvMvQv `gtbi Rb`
 - N cKzi i Drcv`b evovtbvi Rb`

- 2/ GKiu Av`k cKzi i cmbi `exfZ Av` tRtbi gvIv KZ nte?
 - K 3-5 iic. iic. Gg.
 - L 5-10 iic. iic. Gg.
 - M 10-15 iic. iic. Gg.
 - N 1-3 iic. iic. Gg.

- 3/ tKvb&hšjUi minvth` cKzi i cmbtZ evgyni ei vn Kiv thtZ civi?
 - K AvKtgbtWR
 - L tmvP iW`c
 - M civvWj úBj A`vfi Ui
 - N imf

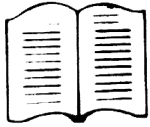
- 4/ mivdDRvi A`vfi Ui Kxfvte KvR Kti?
 - K cmbtK qjz`qjz`KYvq wef`3 Kti
 - L cmbtK evZvfm iQuUtq t`q
 - M cmbtZ NYØ mivó Kti
 - N evZvfm ev Av` tRtbi eyej cmbtZ BbtRKkb t`q|

cW 2.4 MvibK wfiEtZ cKzi tkYweb`im I MVtbi wbgvej x



G cW tkI Avciw –

- MvibK wfiEtZ cKz KZ ai tbi Zv RvbtZ cvi teb |
- wwfbaeKvi cKz Kxfite `Zwi Zv eYDv KitZ cvi teb |
- AvZz cKz, Piv cKz I gRz cKz m=utK Avtj vPbv KitZ cvi teb |



wwfbaeAvKvtii gvQ cUzcvj tbi Rb` wwfbaeaitbi cKzi cUqvRb nq | thgb ti bytciwv cij tbi Rb` cKzi AvKvi tQvU Ges Mfxi Zv Kg ntZ nte | Ab`w tK eo tciwv wKsev cRbb`lg gvQ gRz Kivi Rb` eo I Mfxi cKzi cUqvRb nq | e`e`vcwv m`pavt` Ges Awak Drcv` tbi Rb` ZvB wwfbaeAvKvtii cKzi cUqvRbxqZv itqtQ |

AvKvtii Dci wfiE Kti cKztK cUvZ wZbuU fvtM fVM Kiv ntqtQ |

- 1) AvZw cKz
- 2) Piv cKz
- 3) gRz cKz

AvZw cKz `Zwi

AvqZb t tKvb AMfxi tWvev ev AMfxi tQvU cKztK AvZw cKz wntmte e`envi Kiv hrv | AvZw cKzi AvqZb KZ nte tm wltq tKvb aiv evav wbgg cUvj Z tbB | Zte mvari Yfite 10 t`tK 17 kZisk AvqZtbi AvqZKvi Rj vkq AvZz cKz wntmte fij | bvmfx ev AvZz cKzi Mfxi Zv 1-1.2 wgvUv ntZ cvti |

mvari Yfite 10 t`tK 17 kZisk AvqZtbi AvqZKvi Rj vkq AvZz cKz wntmte fij |

tciwv Drcv`b ev msMni AvtMB bvmfx ev AvZw cKz cUz KitZ nte | cKz cUzKiY ej tZ cKzi iv`lzm gvQ (hw`_vtK), KxUcZ½, AewAZ gvQ `gb Ges cKz i Kvtbv, mri cUqM I Zj t`k Pvl Kiv BZ`w` Kvh`itgi mgwotK eSvq |

tciwv Drcv`b ev msMni AvtMB bvmfx ev AvZw cKz cUz KitZ nte |

cKz hw` Avcbv Avciw i`wktq bv hrv Zvntj cvt=ui mrvith` cwv tmtp cKz i Kvtbv thtZ cvti | cKz i Kvtj tciwv gvKo, AvMvQv I iv`lzm gvQ GgvbtZB `gb ntq hvte | hw` cKz i Kvtbv bv hrv Zvntj Rij tUtB Ges wlt cUqM Kti AewAZ gvQ I KxUcZ½ `gb Kiv thtZ cvti |

Pz cUqM t cKz i Kvtbri ci GtUj gvUv Rb` cUz kZvstK 1-2 tKwR Ges ewj gvUv Rb` 0.5 t`tK 1 tKwR Pzv cv_i ev Kwl.Pz (CaCO₃) cKzi Zj t`tk cUqM KitZ nte |

`Re mri cUqM t AvZw cKzi RycwUv Rb` tbi Rb` `Re mri t`qv Avek`K | Kiv ev GtUj gvUv cKzi i Rb` cUz kZvstK 60 t`tK 80 tKwR Ges ewj gvUv cKzi i Rb` 100 t`tK 120 tKwR tMvev t`qv thtZ cvti |

cwv mieivn I imvqubK mri cUqM t `Re mri t`qvi ci cU`wKfite 15 tm.wg. t`tK 23 tm.wg. cwv mieivn KitZ nte | GK mBvn ci cwv Mfxi Zv 1-1.2 tm.wg. KitZ nte Ges cUvU`tbi cwi gvY evovtbi Rb` 1 tKwR BDwv qv, 1 tKwR wUGmnc Ges 0.5 tKwR cUv w` tZ nte |

nelv³ M'im`ihKiY I tcvKv gvKo`gb t cKzi i cmbtZ eyey t`Lv w`tj noivi mivrth`
(`no Uvbi) Zjt`ktK Avt`vuj Z Kti tcvbr Qvovi GKir b cte^onelv³ M'immgA`i KiTZ
nte| cKzi i cmbtZ AtbK mgq nuntcvKv Rbtq| cZ 10 kZvsk cKzi i Rb` 1 wj Uvi
wWtRj t`uOKti tcvKv gvKo aism Kiv hvq|



Ablyj b (Activity) t aly, Avcbri cZtekr Rbre nviy mntei 15 kZvski GKiu cKz
AvtQ| H cKzuUtK Avcub tKvbaitbi cKz ej teb Zv hv³ mnKvti wj Lly Ges H cKzi i
cZKiy maútK^eY^o Kib (Aba^o150 ka)|

Priv cKz`Zwi

Priv cKzi miv eQi cwb_vtKZ cvti| Priv cKzi AvqZb 0.2 t`tK 0.6 tn±i Ges
Mfxi Zv 1.5 ug. t`tK 2.5 ug. ntZ cvti| cKzi Rvj tUt b gvQ aivi mjeavi Rb` Priv cKz
miyl j^o ntj fvi nq| Priv cKzi 2 t`tK 3 gvm tcvbr cvj b Kiv hvq| tcvbri AvKvi
Gmgq 10 tm.ug. t`tK 15 tm.ug. ntq_vtK|

Priv cKz AvZ^o cKzi i gZ KtiB`Zwi KitZ nte| A_^o Pz, `Remvi I ivmivqubK mvi
cQvM KitZ nte| Ges tcvKv gvKo, iv^ozm I AemAZ gvQ`gb KitZ nte|

mvi cQvM t Priv gvtQi cKzi hvTZ chvB Lv` Rbtq tmRb` `Re I ivmivqubK mvi cQvM
KitZ nte| `Remvi wntmte tMvei tn±i cZ 9900 tKwR Ges ivmivqubK mvi wntmte tn±i
cZ 24 tKwR BDwi qv, 24 tKwR uUGmic I 12 tKwR cUvk mvi t`qv thTZ cvti|

gRz cKz`Zwi

gRz cKzi miv eQi cwb_vtK| Gi AvqZb 0.4 tn±i ev teuk ntZ cvti| teuk eo ntj
Aek` e`vcbv Kiv AmjeavRbK| Avevi cKz tQvU ntj eo gvQ cvj b Kiv hvq bv| GKiu
gRz cKzi i AvqZb Kgct^o 0.13 tn±i ev 33 kZvsk nI qv DvPZ| cKzi i Mfxi Zv 2.5-3
ug. nI qv DvPZ Zte cKz hLb cmbtZ cY^ovtK ZLb wKbri vi w`tK cwbi Mfxi Zv nte 1-
1.5 ugUvi|

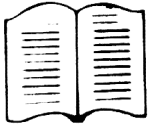
Priv cKz t`tK Priv cWBi cteB gRz cKz`Zwi Kiv DvPZ| i`tgsmtg hv` mæe nq cKz
i wKtq Zjt`tki Kv`vi cwigvY KgvtZ nte| cKzi i cwb A^oq ntj cQvRbgZ Pz cQvM
KitZ nte| iKtbr Ae`vq Zjt`tk Ges cwb cY^oAe`vq cmbtZ Pz wQvUq t`qv thTZ
cvti| GRb` tn±i cZ 740 t`tK 1200 tKwR Pz w`tZ nte|

mvi cQvM t cKzi i Drcv`bkvj Zv ewx Kivi Rb` tn±i cZ 7400 tKwR tMvei, 500-
1000 tKwR nun gjvMi weov Ges 4400 tKwR Kt^ouv± mvi t`qv thTZ cvti| GQvov
ivmivqubK mvi wntmte tn±i cZ 120 tKwR BDwi qv, 75 tKwR uUGmic Ges 36 tKwR cUvk
w`tZ nte|

Dctiv³ cKz,tjv Qvovl cRbb^olg gvQ gRtZi Rb` cKz`Zwi KitZ nq| G e`vcvti
cvV 9.2 G wek`fite Avtj vPbv Kiv ntqtQ|

cKzi Rvj tUt b gvQ
aivi mjeavi Rb` Priv
cKz miyl j^o ntj
fvi nq|

GKiu gRz cKzi i
AvqZb Kgct^o 0.13
tn±i ev 33 kZvsk nI qv
DvPZ| cKzi i Mfxi Zv
2.5-3 ug. nI qv DvPZ|



mvigg® weifbaAvKvfi i gvQ cZcvj tbi Rb" weifbaaitbi cKz cqvRb/ AvKvfi i Dci
 wfiE Kti cKzK cAbZ wZb fM fM Kiv ntqt0 thgb- AvZ0 cKz, Pvi v cKz I gRZ
 cKz/ mvavi YZ 10 t_K 17 kZisk AvqZtbi AvqZvKvi Rjvkq AvZ0 cKz wntmte fvj |
 Pvi v cKz i AvqZb 0.2 tn±i t_K 0.6 tn±i GK i Ges Mfxi Zv 1.5-2.5 ug. nZ ci ti |
 gRZ cKz i AvqZb Kgc t 0.13 tn±i ev 33 kZisk nI qv DvPZ Ges Mfxi Zv 2.5 t_K
 3 ugUvi nI qv DvPZ |



cuVvEi gj`iqb 2.4

mWk DEti i cuK Wk Py (✓) w b|

- 1/ MvubK wfwEtZ cKztk Kq fvtM fWm Kiv ntqtQ?
K 3
L 4
M 2
N 5

- 2/ AvZØ ev bvmfx cKzi i Mfxi Zv KZ nI qv DwPZ?
K 0.5 - 1 ugUvi
L 1 - 1.2 ugUvi
M 0.3 - 0.5 ugUvi
N 0.4 - 0.7 ugUvi

- 3/ 1 GKi AvqZtbi Priv cKzi Kx cwi gvY tMvei mvi w`tZ nte?
K 2000 tKwR
L 3000 tKwR
M 4000 tKwR
N 6000 tKwR

- 4/ gRZ cKzi i AvKvi Kgct¶ KZ nI qv DwPZ?
K 0.40 tn±i
L 0.13 tn±i
M 1 tn±i
N 0.80 tn±i



Povšgji'iqb

mswB I iPbvj-K ckae

- 1/ cki i vb ubeP#bi mgq Kx Kx nel q we#Pbv Kiv D#PZ?
- 2/ cki i g#Ji , Yv, Y Kxfite hvPvB Ki#eb Avtj vPbv Kily|
- 3/ cki cmb mieiv#ni Drmmg#ni eY#v w`b|
- 4/ cki cmb mieivn I w`vkb c#Zi eY#v w`b |
- 5/ cki i ms`vi c#Z eY#v Kily|
- 6/ GK#U Av`k cki i Kx Kx `enkó` _vKv D#PZ Zv #j Lly?
- 7/ cki Kxfite evqmieivn Ki#eb Avtj vPbv Kily|
- 8/ Av#Z cky ev b#m#x c#Z Kxfite c`Z Ki#eb Avtj vPbv Kily|
- 9/ P#v c#Z ev gR#Z cki i c#Z c#j x eY#v Kily|



D#igjv

cW 2.1

- 1/ N 2/ K 3/ L 4/ M

cW 2.2

- 1/ L 2/ K 3/ M 4/ N

cW 2.3

- 1/ K 2/ L 3/ M 4/ N

cW 2.4

- 1/ K 2/ L 3/ M 4/ L

BDubU 3 cwi , Yv, Y

gufQi Rieb avitbi GKvI gva'g ntjv cKz ev Rjvktqi cwb| Avi GRb" cwi tFSZ I i v m i q u b K Ges RieK , Yv, Y gufQi Rieb hvitK cifmeZ Kti | cKzi Zjt`k I Kr`vi , Yv, Y cwi tFSZ I i v m i q u b K , Yv, Y tK ubqSY Kti | gufQi Lv` MhY, `inK epx, cRbb, tetP _vKv Ges , iZcyecvKiq Kvh mgyzite cwi Pij bri Rb" cwi tFSZ I i v m i q u b K , Yv, Y Abkj gvI vq _vKv cQvRb|

G BDubU Rjvktqi cwi eY©MÜ I cwi cwi gvY wBY@, cKzi Zjt`k I Kr`vi , Yv, Y cwi gvc, cwi tFSZ I i v m i q u b K , Yv, Y Ges cÜugK Drcv`tki Dci cfve, cÜugK Drcv`tki tkYmeb`im I , iZ; `exfZ KwB c`v`©I Zvi cKvif`, cwi gvYMZ I , YMZ cfve BZ`w` nel`q we`lwi Z Avtj vPbv Kiv ntq`Q|

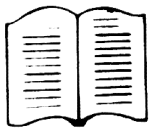
cW 3.1 Rjvktqi cwi cÜugK eY©MÜ, I cwi cwi gvY wBY@, cKzi Zjt`k I Kr`vi , Yv, Y cwi gvc



G cW tkI Avcb –

- Rjvktqi cwi cÜugK eY© MÜ m`fÜ Avtj vPbv KitZ cvi`teb|
- cKzi cwi cwi gvY Kxfvte wBY@ Kiv hvq Zv RvbtZ cvi`teb|
- cKzi Zjt`k I Kr`vi , Yv, Y Kxfvte cwi gvc Kiv nq Zv eY©v KitZ cvi`teb|

cwi eY©



cwi eY©ej`tz tmme eY©K eSvq hv wewfbætKij tqW I `exfZ `te`i Rb" cwb jvf Kti _vtK| cwi cKZ.eY©ej`tz Gme Kvi`y m`p eY©KB eSvq| KvtRB tkvb RmeZ ev gZ Sz`š I wewfbæw`e`i cfve thgb AvKviki eY©A`ev AMfii Rjvktqi Zjt`tki eY©v`iv m`p eY©K cKZ.eY©ntmte aiv nq bv| Aek" cwi AvcvZ eY©m`p`i Gme cfveK AtbK mgq cwi eY©m`fÜ fj eSvq`si m`p Kti |

cÜKwZK cwb wewfbæeY© ntq _vtK| tkvb tkvb Rjvktqi cwb eY©xb Avevi tkvb tkvb Rjvktqi cwi eY©LgB Mip ntq _vtK|

wbaj ulZ e`cÜKwZK cwb`Z eY©m`p`i Rb" `vqx t

- 1) Avqib t tdim mvj`tdU ev tdim K A` vBW wntmte Avqib nj`y eY©m`p`i Kti |
- 2) wDgvm e`t bxj , meR, nj`y, ev`vqx, Mip ev`vqx BZ`w` wewfbæeY©m`p`i Kti _vtK|
- 3) K`ij wmqv KvefBU t cPz cwi gufY K`ij wmqv KvefBU meR eY©m`p`i Kti etj `vex Kiv nq|

cwb eY©xb nl qvi GKwU fij w`K nt`Q th cwb`Z teuk teuk mhaj`vK cÜek KitZ cvi`te|

FZzcwieZfbi mvt_ mvt_ cwi eY©e`j nl qvtK `Zwmx etj wetePbv Kiv nq| eQtii tkvb wv`@ mgq cwi eY©LgB nvj Kv ntq th`Z cuti | mivmwi mhaj`vtK cwb eY©xb nl qv cfmeZ Kti etj Rvbr hvq| cwb eY©xb nl qvi GKwU fij w`K nt`Q th cwb`Z teuk teuk mhaj`vK cÜek KitZ cvi`te| dtj H Rjvktqi dvBtUvcw`U`bi mvt`vK mstk`Y Kvh`eg epx cvte| Kj`ii wlvri bigK hš`e`enri Kti cwi eY©cwi gvc Kiv nq|

Kul.1 cj-x Dbqab -x

cubi MÜ

wei x cubi tKib MÜ bv vKtj l newfbaKviY cKzi i cubi MÜ Zwi nZ cti | AZ waK cwi gvtY cPbkj Re c`v`_ vKtj B cKzi i cubtZ Lvi v MÜ cwi j wZ nq | ubweo Pti li Avl Zvq th mg`l cKzi cPz cwi gvtY m`u`K Lv` t`qv nq tm me cKzi i cub MÜh nq | GQvov`rfweK Ae`vq cKzi i cubtZ tKibi c MÜ v`K bv |

AZ waK cwi gvtY
cPbkj Re c`v`_
vKtj B cKzi i cubtZ
Lvi v MÜ cwi j wZ
nq |

cKzi i cubi cwi gvtY wYq

bv bwea c`qvRtb cKzi newfbaeivm`v`K c`v`_ c`qvM Kivi c`qvRbxqZv t`Lv t`q | thgb KUlCZ½ ev AewAZ gvQ wbg` Kivi Rb` cKzi w`l c`qvM KiZ nq | GB w`l c`qvM Mi GKUl wbr` g`v` AvtQ | Dni Kg ntj KvRi nte bv Ges tenk ntj cub A`bK w`b gvQ Pti li A`hwM` vKte | KvRB wbr` g`v` wntme Kivi Rb` cKzi Kx cwi gvtY cub AvtQ Zv cwi gvtY Kivi c`qvRb cto | mviYZ cKzi w`li Nbgv`v` w`c`c`Gg. (ppm-parts per million) GKtK MYbv Kiv nq | Dni l Rb w`f`E`Z w`ba`Y Kiv D`PZ | AvqZb w`f`E`Z KiZ A`bK mgq tm MYbv w`f` nq bv |

KUlCZ½ ev AewAZ gvQ
wbg` Kivi Rb` cKzi
w`l c`qvM KiZ nq |
GB w`l c`qvM Mi GKUl
wbr` g`v` AvtQ |

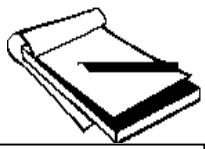
cwi gvtY newfbaGKK

Avgiv AwKiskB c`v`DÜ, tKwR, M`v`b, GK i BZ`w` newfbaGKK Ges kZKiv nvti m`t` cwi wPZ |

thgb- Avgiv Rwb 16 Avd`Y 1 c`v`DÜ Ges 2.2 c`v`DÜ 1 tKwR ev 1000 M`g nq |

AvqZbi t`j`f` Avgiv wj Uvi, M`v`b BZ`w` e`envi Kw | 1 M`v`b mgvb 4.55 wj Uvi (1 wj Uvti 1000 w`m`w`)

GK NbdY cubi AvqZb 7.5 M`v`b Ges l Rb 62.4 c`v`DÜ | tKvb cKzi i cubi AvqZb KZ Nbd` Zv Avgiv mnt`RB gvtZ cwi | c`tg Avgt` i H cKzi i `N` c`v` l Mfxi Zv KZ d` Zv RivtZ nte | Zvici wZwU msL`vi Y KiZ B cKzi i AvqZb KZ Nbd` Zv Rivv hvte |



Abloj b (Activity) t aiY, Avcbri GKUl cKz AvtQ hvi `N`150 d` c`v`90 d` Ges Mfxi Zv 7 d` | H cKz wU cubi AvqZb KZ M`v`b Zv tei KiZ |

GKi-d` ntj v AvqZbi
GKK hv GK GKi
cKzi i 1 d` Mfxi Zv
chS`cubi AvqZb w`b`R
Kti |

GKi-d` ntj v AvqZbi GKK hv GK GKi cKzi i 1 d` Mfxi Zv chS`cubi AvqZb w`b`R Kti | 1 GKi-d` 43,560 NbdY ev 3,26,000 M`v`b ev 27,18,000 c`v`DÜ cub v`K | cKzi i AvqZb GKti tgc Mo Mfxi Zv (d`) w`tq Y Kti GKi-d` wntme Kiv hvq | wntme Kti t`Lv tM`Q th

1 w`c`c`Gg. NbZj Rb` i Kvi nte - 2.7 crt / GKi-d`
0.0038 M`g / M`v`b
0.0283 M`g / wKDieK d`

Kv`vi Yv`Y

cKzi i Kv`v Drcv`bkj Zv ew` Kti | cKZ.Kv`vi c`v`b Dcv`vb n`Q gvw KYv wKŠ` GvU`Z tek cwi gvtY Re c`v`_ v`K | Re c`v`_ mg` w`n`Dgvm` AvKvti v`K hv GKUl D`P

AvYneK IRb meikó`Re thštMi b`vq AvPiY Kti | e`vKtUmiqv Oviv DvM` I c`vYR `e`
fvštbi ci ōtKvj tqWŌ unmtē Kv`v RgtZ`_vtK | unDgvm unDvgK GmštWi Rb` `gP GmW
unmtē Ges bvBtUtRb RvZxq c`vt`P Rb` `gP ŋvi unmtē e`eüZ ntZ cvti | A`P Kr`vi
evdvi ŋgZv AvtQ hvi dtj pH cwi eZB`wKQv ubqšY Ki tZ cvti |

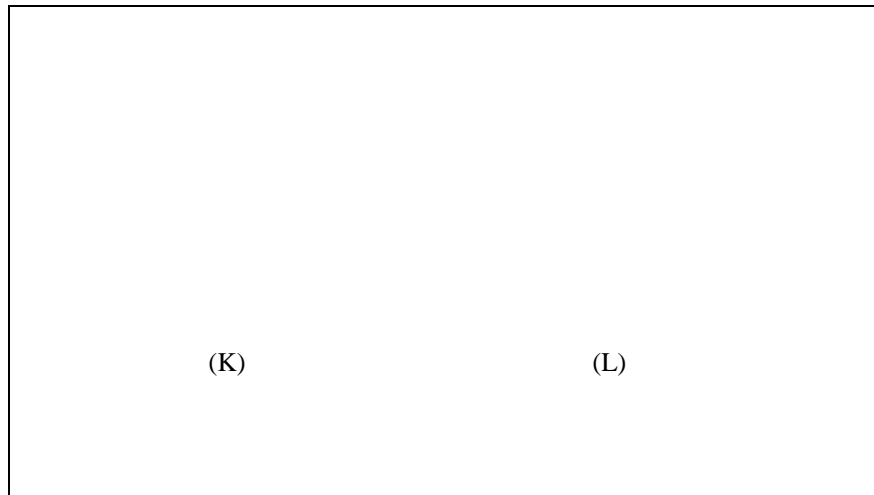
cKzi i Zjt`tk 1 dži
teuk Kr`v`_vKv DvPZ
bq | cKzi Ly teuk
cwi gvtY Kr`v`_vKtj
cmbtZ weLv³ M'vftmi
mjo nte |

cKzi hw` GK`g Kr`v`bv
_vtK Zvntj thme gvQ
ubtPi`fti i Lvevi Lvq
thgb gMj, KwcP Giv
teuk evote bv |

cKzi i Kr`vq thtnZzRe c`v`Rgv`_vtK ZvB AtbK AtpjYUx cŌYx thgb Gtbij Wv cteP
AšfP Ges AtbK KxUcZtzi jvfPZ`_vq evm Kti | Kr`vi `Yv`Y ej tZ MvVbK Dcv`vb
Qvovl tm mg`IRxtei cŌPzV esvq | tm Rb` th tKvb cKzi Aek`B Kr`v`_vKv DvPZ | Zte
cKzi i Zjt`tk 30 tm.ug. Gi teuk Kr`v`_vKv DvPZ bq | G cwi gvtY Kr`v`_vKtj ubtPi
`fti i (KwcP, gMj) gvQ`_tj v fvj evote Ges cKzi cmb teuk w`b`_vKte | cKzi Ly teuk
cwi gvtY Kr`v`_vKtj cmbtZ weLv³ M'vftmi mjo nte | Gi dtj cKzi i cwi tek bó nte Ges
Av` tRtbi NvUvZ t`Lv`w`te | cKzi hw` GK`g Kr`v`bv`_vtK Zvntj thme gvQ ubtPi`fti i
Lvevi Lvq thgb gMj, KwcP Giv teuk evote bv | Kvi Y Kr`vi gta`B Gt` i Lvevi`_vtK |

cKzi i Kr`vq th mg`I cŌYx evm Kti Zvt`i tK tebt`vm (Benthos) etj | cKzi i Kr`v`
DvWtq tebt`vftmi cwi gvYMZ I `YMZ mektk`tYi gva`tg Kr`vi `Yv`Y cwi gvc Kiv thtZ
cvti |

Kr`vi bgly mslMni Rb` th hšj e`eniv Kiv nq Gi bvg BKtgbtWR (Ekmandredge) |
Giu LyB mavi Y GKiu hšj BKtgbtWR hšjUi gly tLvj v ti tL DvntZ mshP` iuk atı cKzi
ubtPjC Kiv nq | hšjUi IRb teuk weavq mstM mstM Dv Kr`vq tcštŌ hte Ges wKQv Kr`v`
Dvvi gta` Xkte Ges Avcbv Avcwb gly eÜ ntq hvq (wPŌ 19 K I L) | GLb iuk tUtb
hšjUtK Dcti ZjtZ nte | Dvvi gly Ltj Kr`v`tei Kti GKiu Pj ubtZ wKQycwb w`tg



(K)

(L)

wPŌ 19 t BKtgbtWR (K) tLvj v Ae`vq (L) eÜ Ae`vq

bvovtj GK mgq AtcŋvKZ.eo cŌYx ev`Re c`v`Pij ubtZ`_vKte Ges Kr`v` ašq hte |
GLb tebt`vm`_tj v Pj ub t`_tK mslM Kti Gt` i cwi gvtY ubaŋY Ges tkYweb`im Ki tZ nte |
BKtgbtWRi AvqZb Rvbr AvtQ | ZvB GKiu cKzi i KtqK RvqMv t`_tK bgly mslM Kti
Dvnt`i Mo Kti cKzi i tgU AvqZtb Kx cwi gvtY tebt`vm AvtQ Zv mntRB wbyQ Kiv hvq |

Kul. I cj x Dbqb 7

GQvor cwb ev gvuLi c0wgK Drcv`tbi Rb` th mg`l tgs`tji `i Kvi nq tm,tjv wewfbae
AYR`xtei Ask Mh`tY GKwU P`mi gra`tg m`ub`raenq| c`kzi Kiv`v br_vKtj G Pμ wKgz
m`ub`raenqZ cvi te br|



mvi gg c0KwZK cwb wewfbae`tYp n`q_vtK| tKvb tKvb Rj vktqi cwb eY`xib Avevi tKvb
tKvb Rj vktqi cwbi eY`L`B Mip n`q_vtK| wbeo P`tli Avl Zvq th mg`l c`kzi c0z
cwi gr`tY m`u`i-K Lv` t`qv nq tm c`kzi i cwb MÜhy` nq| c`kzi Ly tenk cwi gr`tY Kiv`v
_vKtj cwbtZ wlv`3 Miv`mi m`p nte| mvaivYZ c`kzi i KxUcZ½ ev Aem`AZ grQ `gtbi
Rb` uc.uc.Gg. wntmte wcl c0qM Kiv nq| Kiv`vi bgby msM`ni Rb` th hšje`enri Kiv nq
Zvi bvg BKtgbtWR|



cuVvEi gj`iqb 3.1

mWk DEti i ctk Wk Pý (✓) w b|

- 1/ cKzi i cmb tKb meR nq?
 - K) meR A`ij wR ev dvBtUvcwUtb i Rb`
 - L) tek Avqj b_vKvi Rb`
 - M) tek RycwUv_vKvi Rb`
 - N) tek tek Rj R AvMvQv_vKvi Rb`

- 2/ GK i-dh ej tZ Kx tevSvq?
 - K) GK GK i mgvb KZ eMdh
 - L) GK GK i AvqZb Ges GK dh Mfvi Zv
 - M) GK GK i mgvb KZ Nbdh
 - N) GK GK i mgvb KZ eMgUvi

- 3/ 1 M`ij b cmbtZ 1 uc.uc.Gg. NbZji `èY `Zwi i Rb` Kx cwi gvY `è` w tZ nte?
 - K) 2.7 cvDU
 - L) 0.7 cvDU
 - M) 0.0038 Mg
 - N) 0.0283 Mg

- 4/ cKzi cwi gZ cwi gvY Kv`v_vKtj tKvb&gvtQi epv fvj nq?
 - K) KB
 - L) KvZj v
 - M) Mm Kvc®
 - N) KvcP

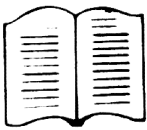
- 5/ Kv`vq th mg`IRxe em Kti Zvt`i tK GK K_vq Kx etj?
 - K) dvBtUv cwUv
 - L) teb_tvm
 - M) Ry cwUv
 - N) A`ij wR

cW 3.2 cwbi tfSZ I imvqubK , Yv, Y Ges c0_ugK Drcv`tki Dci Gi cfve



G cW tkI Avicb -

- cKzi i cwbi tfSZ , Yv, Y Kx Kx Zv ej tZ I wj LtZ cvi teb|
- cKzi i cwbi imvqubK , Yv, Y Kx Kx Zv ej tZ I wj LtZ cvi teb|
- cKzi i cwbi tfSZ , Yv, Y Kxfite c0_ugK Drcv`btk cfmeZ Kti Zv eY0v KitZ cvi teb|
- cKzi i cwbi imvqubK , Yv, Y Kxfite c0_ugK Drcv`btk cfmeZ Kti Zv e`vL`v KitZ cvi teb|



grm` Pvlxt`i Rb` cwbi , Yv, Y e`e`vcbr GKK , iZcY`cfveK| cwbi , Yv, Y e`e`vcbr GKIU Pj gvb c0_ugK hv tkvb w`b tkI nq bv Ges Gi Rb` GKRb gvQ Pvlxt`K A`bK kg w`tZ nq|

cwbi , Yv, Y ej tZ Kx eSvq? cwbi , Yv, Y ej tZ tfSZ, imvqubK I `RueK Drcv`v`bi mgw0 eSvq hv Rj R cwitek MVb Kti Ges gvQI Drcv`btk cfmeZ Kti | cKZ.c`f` Gt`i GKIUi cwieZ0 Ab`u`tk/Ab`vb` , tjt`K cfmeZ Kti |

cKzi cwbi tfSZ , Yv, Y

cKzi i cwbi newfbretfSZ , Yv, Y gvQI Drcv`v`bi Dci cfve tdtj | tfSZ , Yv, Y m`f`U mst`f`tc w`bAvtj`Pbv Kiv ntjv t

cKzi Mfxi Zv

cKzi i Mfxi Zv cwbi tfSZ, imvqubK I `RueK , Yv, Y wKQv w`bqSj Kti | cKz hiv` tenk AMfxi nq Zvntj mh`KiY cKzi i Zjt`k chSltcSv`Z cvi dtj cKzi tenk tenk Dv`c Rb`te| Avevi AMfxi cKzi i cwbi Mfxi Zv Lg ZvovZwio Mig ntq hvq, dtj gvQI f`wZ nI qvi m`tebv `vtK| Ab`w`tk cKzi i Mfxi Zv hiv` Lg tenk nq Zvntj cKzi i w`b`tk mh`jvK c0ek Kite bv dtj H AA`jtj tkvb c0_ugK Drcv`b m`e nte bv| dj m`f`c Dv` tgvU Drcv`b tZgb tkvb fvgKv ivLte bv|

AMfxi cKzi i cwbi Mfxi Zv Lg ZvovZwio Mig ntq hvq, dtj gvQI f`wZ nI qvi m`tebv `vtK|

Zvcgv`v

Mfxi Zv w`b mh`Zv`ci dtj cKzi i cwbi w`b D0Zv `ti w`f`3 ntq hvq- tenk D0, (Dcti i `li), Kg D0 (ga` `li) I W0v (w`bPi `li)| th`nZzmh`KiY thLv`b tenk tkw`l Z nte tmLv`b dvB`Uvc- v`U`bi mvtjvK mst`k- IY tenk nte Ges dj kv`ZtZ Av` tR`bi cwigvY tefo hvte| w`bPi `ti th`nZzmvtjvK mst`k- IY nte bv ZvB H `ti Av` tR`b `f gv`vq `vKte ev Gt`Kv`ti B Av` tR`b kY` nte|

mU`v`tejv hLb mh`jvK `vKte bv Ges Zvcgv`v Ktg hvte ZLb newfbre`ti i cwbi w`gkY NUte| G fite cwbi newfbre`ti i w`gkY gvQI Rb` LgB f`wZKi KviY GtZ w`bPi `ti i `f Av` tR`bhj` cwbi m`u`Y`Rj vktq w`gk w`Mtg Av` tR`bi `f Zv NUv`Z cvi |

cKzi i cwbi Zvcgv`v Ktg tM`jtj gvQI e`x Ktg hvq|

cKzi i Zvcgv`v Ktg tM`jtj gvQ Lvl qv`vl qv Kvgtq t`q dtj gvQI e`x Ktg hvq Ges gvQI Drcv`b n`m cvq| Avevi Zvcgv`v Av`w`K ntj I gvQI f`wZ nq|

cubi A`QZv

cmbtZ e`KYv ugnkZ Ae`vq _vKtj A`QZvi mjo nq| cw4Ub I cubi A`QZvi Rb` `vqx nZ cvti Zte tenki fVM t`qT Kiv`vKYv Rb` cubi A`QZv mjo nq| Kiv`vKYv Ovi v mjo A`QZv cubi wfZti mhaj vK cletk weNemjo Kti dtj dvBtUv cw4Utb mvtj vK mstk- IY e`nZ nq Ges Drcr` b Ktg hvq| Kiv`vKYv AtbK mgq w_Ztq cKzi i Zj t`tk tcSOtZ cvti Ges Zj t`tk Aew`Z teb`K RxeTK tXtK tdj tZ cvti | Kiv`vKYv cubi tPtq tenk Zvc tkvY Ki tZ cvti dtj Kiv`vKYv Ovi v mjo A`Q cubi `Q cubi Atc`qv tenk Mig nq| ZvB Mj`Kvtj A`Q cubi gvQi Rb` Avi I tenk qvzi KivY nq| cw4Ub Ovi v mjo A`QZvi Aek` gvQi Drcr` b ewx`tZ mnvqZv Kti _vtK|

Avtjv

th cKzi i cmbtZ mhaj vK tenk cto tmLvtb mvtj vK mstk- IY fvj nq Ges gvQi Drcr` b ewx` cvq| tmRb` cKzi Ggb RvqMvq nI qv DvPZ thLvtb chvB mhaj vK _vtK| AtbK mgq KPwi cvbv Ovi v cKzi i cubi Dcwi `li AveZ t`tk Avtjv cletk eU Kti t`q| Gifc cKzi gvQi Drcr` b AtbK Ktg hvq|

cKzi Ggb RvqMvq nI qv DvPZ thLvtb chvB mhaj vK _vtK|

cKzi i cubi imvqbK , Yv, Y

`exfZ Aw tRb

cKzi i cmbtZ chvB `exfZ Aw tRb i qvYte`qY Kiv mjo`nvZxZfvte GKRB gvQ Pvlxi Ab`Zg , iZcY`KvR| cmbtZ `fvte Aw tRb `exfZ nZ cvti- cubi Dcwi fvtM mi vmi evqgUj t`tk Ges cKzi i RjR Dv`f`i mvtj vK mstk- IYi gva`tg| dvBtUv cw4Utb mvtj vK mstk- IYi gva`tgB wmsnfvM Aw tRb cmbtZ `exfZ nq|

gvQ `exfZ Aw tRb dj`Kvi mnvth` MhY Kti wecvKxq KvH`m`ubaeKti | ZvB `exfZ Aw tRb i cwi gvY Ktg tMj gvQ kjm Kto gviv hvq| AwZwi`3 dvBtUv cw4Ub AvtQ Gifc cKzi tgNjv w`tb Ges i vT Aw tRb `fZv t`Lv w`tZ cvti | dvBtUv cw4Ub ev cU`ugK Drcr` tKi kmb KvH`m`ubaeKivi Rb` I `exfZ Aw tRb i cU`qvRb itqtQ| cKzi cubi Aw tRb i NbZj5 uc.uc.Gg. ev Gi tenk _vKv fvj |

cKzi i cubi Aw tRb i NbZj5 uc.uc.Gg. ev Gi tenk _vKv fvj |

`exfZ KveB WvB A· vBW

cKzi i cmbtZ KveB WvB A· vBW `exfZ Ae`vq _vtK| GQvov gvQ, cw4Ub I Ab`vb` Ritei kmb KvthP dtj I KveB WvB A· vBW Drcb`enq| mvtj vK mstk- IY cU`qvRb Rb` dvBtUv cw4Ub Dciv`vb wntmte KveB WvB A· vBW MhY Kti | tmRb`B dvBtUvc- v4Utb i `fvteK ewx`i Rb` chvB cwi gvY `exfZ KveB WvB A· vBW cKzi i cmbtZ _vKv Avek`K| Zte AZ`waK gvT`vq `exfZ KveB WvB A· vBW I dvBtUvc- v4Ub gvQi I ci qvzKi cfvte tdj | KveB WvB A· vBtWi gvT`v 6 uc.uc.Gg. Gi tenk nZ cubi A`vZv ewx` cvq|

KveB WvB A· vBtWi gvT`v 6 uc.uc.Gg Gi tenk nZ cubi A`vZv ewx` cvq|

A`vj K`vuj vbuU

cKzi i cmbtZ `exfZ qvixq LubR mg`tni tgvU NbZB nT`Q A`vj K`vuj vbuU| mvavi Yfvte A`vj K`vuj vBb cubi (40 ug.Mh/vj Uvi Gi tenk) ckg ev A`vq cubi tPtq Avak Drcr` bkj | tgvU A`vj K`vuj vbuU i GKvU eo Ask dmdivtmi Dcwi`vzi Rb` nq| dmdivm dvBtUv cw4Ub ewx`i Rb` , iZcY`Dciv`vb|

Kul.1 cǝ-x Dbq̄b ǝ

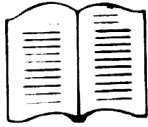
cmbi pH

cmbi pH gvĪv Rv̄bvi gvaṯg GK̄u cǝǝi gvQ PvlṯhvlṯZv ɯbifcY Kiv hɯq| gvQ Pvl cǝǝi cmbi pH 6.5-8.5 Gi gṯaṯ nṯj fij | pH Gi gvĪv Abṯvbṯ DcvṯbṯK cǝṯmeZ Kṯi ǝṯK|

gvQ Pvl cǝǝi cmbi
pH 6.5-8.5 Gi gṯaṯ
nṯj fij |



Ablyj b (Activity) t Avcbri gvṯQi cǝǝi cmbi pH KZ Zv ɯbYq̄ Kily Ges H gvĪv ṯKvbṯṯKvbṯgvQ Pvl i Rbṯ mṯevḂg| pH Gi cwi gvY Kg nṯj Krfvṯe evovṯeb th mṯṯKṯ ɯj Lṯ (Abṯṯ100 kṯ)|



mvi ggṯ cmbi ṯY, Y ejṯZ ṯṯṯ, i ɯvq̄bK I ṯR̄eK Dcvṯṯbi mgwṯ eṯiq hv Rj R cwiṯek Mvb Kṯi Ges gvṯQi DrcvṯbṯK cǝṯmeZ Kṯi | cǝǝi Mfxi Zv, ZvcgvĪv, cmbi AṯṯZv I Avṯj v BZṯṯ cǝǝi cmbi ṯṯṯ ṯY, Y | G ṯṯṯ ṯY, Y, ṯj v ɯvrfbṯvṯe gvṯQi Drcvṯṯbi Dci cǝṯe ṯṯj | ṯṯṯ Avṯ ṯRb, ṯṯṯ KveṯWvB Aṯ vBW, Aṯj Kṯṯj ɯbṯ Ges cmbi pH BZṯṯ cǝǝi cmbi i ɯvq̄bK ṯY, Y | gvQ Pvl i cǝǝi ṯṯṯ Avṯ ṯRb, ṯṯṯ Kveṯ WvB Aṯ vBW, Aṯj Kṯṯj ɯbṯ I cmbi pH mṯWK gvĪvq ǝvKv ṯi Kvi |



cvfVvEi gj`iqb 3.2

mWk DEti i cvfk Wk wPy (✓) w b|

1/ tKvbW cwb i fFZ Ae`vi Avl Zvq cto br?

K) Mfxi Zv

L) `^QZv

M) ZvcgvIv

N) `exfZ KwWb c`v_©

2/ tgNj v w`tb ev i vT Av tRb NvUwZ t`Lv w`tj Dnv KwWb`R Kti?

K) cKzi cPz gvQ AvtQ

L) cKzi cPz Ry cv%Ub AvtQ

M) cKzi cPz dvBtUv cv%Ub AvtQ

N) cKzi cPz Kv`v AvtQ

3/ cKti i Drcv`b evotZ dmdim Kxfvte KvR Kti?

K) gvQ mi vmi dmdim MhY Kti

L) dmdim dvBtUv cv%Utbi Drcv`b ewx`Z mnvqZv Kti

M) dmdim Ry cv%Ub ewx`Z mnvqZv Kti

N) dmdim pH cwi eZfb FYvZK figKv i vL

4/ gvQ Prtli cKzi i cwb i pH KZ ntj fij?

K) 6.5-8.5

L) 5.5-7.5

M) 4-6

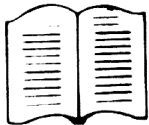
N) 7-10

cŪ_ıgK Drcv` tKi tkYneb`ım I , i žj



G cŪ_ıgK Drcv` tKi msÁv ıw` tZ cvi žeb|

- cŪ_ıgK Drcv` tKi msÁv ıw` tZ cvi žeb|
- cŪ_ıgK Drcv` tKi tkYneb`ım Rıv tZ cvi žeb|
- cŪ_ıgK Drcv` tKi , i žj Av t j v Pbv Ki tZ cvi žeb|



th mKj Rxe tmšı kw³ tK i fcvšlı Z Kti Dnıv` i ıw tRt` i Ges Ab`vb` Rıxı Rb` Lv` kw³ Drcv` b Ki tZ cvi ž Dnıv b cŪ_ıgK Drcv` K| Gıv Lıv` i Rb` Ab` tKıv Rıxı Dcı mıv mıı ıw fP Kti bv| meR Dıw³ tK cŪ_ıgK Drcv` K e j v nq Kvi Y Gıv tKıv i vıdj enb Kti Ges tKıv i vıdj m h t j v tKi m nıv Zıv KveŃ WıB A- vB W I cıvb e`envı Kti M- žKıv R Drcv` b Ki tZ cvi ž| c ž j i cıvb tZ th me Av Z ž ž a ž Dıw³ ıbgıw³ Z/fımgıv Ae`ıq _ v tK Zıv` i tK dvB tUv cıw/Ub e j v nq| c ž j ıbgıw³ Z Ab`vb` ıw Kóhy eo Dıw³ I _ v K t Z cvi ž ıw K S` dvB tUv cıw/Ub tKB tKıv c ž ž ev R j v k t q i Drcv` b k j Zıv mPK ıw t m t e w e t e Pbv Kıv nq| A % Re c` v _ Ges cıw/Ub t fıv Rıx gıQ ev Rıxı ga`e Z P` v t b dvB tUv- v /U t b i Ae`ıv | dvB tUv cıw/U t b i , i ž j i K _ v w e t e Pbv K t i B G A a v t q c Ū _ ı g K D r c v ` K ı w t m t e dvB tUv- v /U t b i t k Y n e b ` ım t ` q v n t j v | A i j ı R , ıw K O y e v K t U m i q v Ges tKıv Q I v t K i R x e b P t j m i ıw K O y ` k v dvB tUv- v /U t b i (phytoplankton) A š f | Z t e G t` i g t a` A i j ı R c a v b |

c ž j i cıvb tZ th me Av Z ž ž a ž Dıw³ ıbgıw³ Z/fımgıv Ae`ıq _ v tK Zıv` i tK dvB tUv cıw/Ub e j v nq|

cŪ_ıgK Drcv` tKi tkYneb`ım

ce² BDıM- t b r d v B U v

- eM² BDıM- t b B j m
- D`vni Y- BDıM b v (Euglena)

ce² tKıv i v d v B U v

tKıYx- tKıv i v d v Bıw

- eM² f j t fıv t K B j m
- D`vni Y - cıw j tUıt g j - v (Polytomella)

- eM² tUıı t w v t i B j m &
- D`vni Y - cıv t g j - v (Palmella)

- eM² tKıv i v K K t K B j m &
- D`vni Y - tKıv i v K K Kıg (Chlorococcum)

- eM² ıR Mıbgıv t U B j m &
- D`vni Y - ıv B t i v Mı B i v (Spirogyra)

- eM² BD t j v U t b t K B j m &
- D`vni Y - gıv B t j v t ıv i v (Microspora)

tkYx - Kvđi vdiBim

eM[®] Kvđi Bj m
D`vni Y - Pvi v (Chara)

ce[®] μvBđmvdvBUv

tkYx- h`rđđđiBim

eM[®] i vBđRvđKvvi đWBj m&
D`vni Y - w÷wCđUvKKKv (Stipitococcus)

eM[®] tnđUđi vK`vcđmBj m&
D`vni Y - g`đj I đWbWb (Malleodendron)

eM[®] tnđUđi vKKđKBj
D`vni Y - đKvđi veUxm (Chlorobotys)

eM[®] tnđUđi vUđBđKBj m&
D`vni Y - UđBđembgv (Tribonema)

eM[®] tnđUđi vmiBđdvđbBj m&
D`vni Y - FvDđPvi qv (Voucheria)

tkYx- μvBđmvdvBim

eM[®] μvBđmđgvbđWBj m&
D`vni Y - μvBmwm (Chrysapis)

eM[®] i vBđRvμvBimđWBj m&
D`vni Y - μvBimWbđq÷đg (Chrysidiastrum)

eM[®] μvBđmK`vcđmBj m
D`vni Y - wđI cđKv (Phaeoplaca)

eM[®] μvBđmUđBđKBj m&
D`vni Y - wđI _`vgvbqb (Phaeothamnion)

ce[®] wđI dvBUv
D`vni Y - tnvi evDwđtqj - v (Heribaudiella)

ce[®] cvBđi vdiBUv

tkYx- đWmđgvKbđU

eM[®] đWmđgvbđWBj m&
D`vni Y - Bđ· wđđtqj - v (Exoviaella)

tkYx- WvBđbvdiBim

eM[®] MvBđbwmđbGBj m&
D`vni Y - MvBđi wđwđbqv (Gyrodinium)

Kul.1 cj-x Dbqb -x

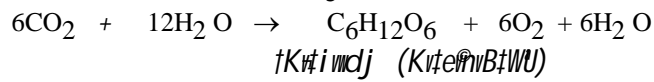
eM[®] tcwi wWbGBj m&
D`vni Y - tniqWwbbqvg (Hemidinium)

eM[®] WvBtbvK`vc`tmBj m&
D`vni Y - BDfi vKKKvm (Urococcus)

c0_ugK Drcv`tki , iZi

th tKvb Rxei epx Ges weKvtki Rb` th kw³i c0qvRb nq Zvi Avmj Drm nt`Q tmSi kw³
(solar radiation) | tKej meR Dw[™] mvtjvK mstk- IY c0qvri gva`tg tmSi kw³tk
Rxei Mb`Yvc`thvMx kw³tz (KvtefvBtWU) ifcivSi Z Ki`Z cvti |

Avtjv



th mg`Rxe mi vmi
tmSi kw³ e`envi Kti
wb`Rt`i Rb` Ges
Ab`vb` m`u0vtqi Rb`
kw³ DrcbGes Rgv
Ki`Z cvti Dnv`i tk
c0_ugK Drcv`K etj |

th mg`Rxe mi vmi tmSi kw³ e`envi Kti wb`Rt`i Rb` Ges Ab`vb` m`u0vtqi Rb` kw³
DrcbGes Rgv Ki`Z cvti Dnv`i c0_ugK Drcv`K etj | meR Dw[™] i mvtjvK mstk- IYB
nt`Q mKj `RweK Kv`R e`eüZ kw³ Ges `Re c`vt`P Drm | mZi vs tKvb Rj vktqi Drcv`b
Dnvi c0_ugK Drcv`tbi Dci wbf`Kxj | emni t`_tk mi vmi Lv` mieivn bv Kti tKvb
Rj vktqi gvtQi Drcv`b epx Kivi K_v iPSi Kij c0_tgB Dnvi c0_ugK Drcv`b epx Ki`Z
nte | meR Dw[™] i (cKzi c0%Ub) mvtjvK mstk- I`Yi Rb` KveB WvB A· vBW I cmb
Qvovl weifbæ aitbi A`Re c`v`_`thgbN bvBtUtRb, dmdivm, mij dri, cUmkqvg,
K`ij umqvg, Avqi b, g`v%vibR, wRsK, Kcvi BZ`w`i c0qvRb nq |

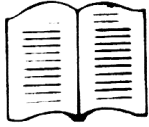
`Re c`vt`P Rb` Dw[™] B nt`Q c0Yt`i GKgvI kw³i Drm | gvQ wb`Ri Lv` wb`R `Zwi
Ki`Z cvti bv | KvtefvBtWU wntmte Dw[™] th Lv` `Zwi Ges Rgv Kti Dnvi c0Yt`i epx
Ges weKvtki Rb` e`eüZ nq | Kv`RB mvtjvK mstk- IYtk gvQ ev Ab`vb` c0Yx Drcv`tbi
mvt`_ m`u³ Kiv nq |

tKvb Rj vktqi tgvU
Drcv`b epx Dnvi
c0_ugK Drcv`K ev
dvBtUvc- vsU`bi
Drcv`b epx i Dci
mi vmi wbf`Kxj |

wfue Qvov thgb tKvb weiv s Kí bv Kiv hvg bv tZgub c0_ugK Drcv`K Qvov `RweK Drcv`b
(Biological production) Kí bv Kiv hvg bv | tKvb Rj vktqi tgvU Drcv`b epx Dnvi
c0_ugK Drcv`K ev dvBtUvcusU`bi Drcv`b epx i Dci mi vmi wbf`Kxj |

c0_ugK Drcv`K mvtjvK mstk`Y weivqv NUvtbvi mgq th Av` tRb DrcbæKti Dnvi mvtjvK
mstk- I`Y `Zwi thSMtk Rvii Z Kti KveB I kw³ Drcv`tbi Rb` e`eüZ nq | Ab` cvtVI
ejv ntqtQ th cmbtZ `exfZ Av` tRtbi Rb` c0_ugK Drcv`tki mvtjvK mstk- IY c0qv
GKuU Ab`Zg , iZcy[®]Drml c0_ugK Drcv`K th Av` tRb `Zwi Kti Zv` iayDnv`i
wb`Rt`i bq eis mKj Rxei kmb Kvth`e`eüZ ntq`_vtK | cmbtZ `exfZ gY KveB WvB
A· vBW mvtjvK mstk- I`Yi Rb` e`envi Kti dvBtUv c0%Ub KveB WvB A· vBtWi NbZ;
wbqSY Kti`_vtK | mZi vs, t`Lv hvt`Q th tKvb Rj R cwi`teti BtKvmt`÷tg c0_ugK
Drcv`K c`v`v fvgKv cij b Kti`_vtK |

tKvb Rj R cwi`teti
BtKvmt`÷tg c0_ugK
Drcv`K c`v`v fvgKv
cij b Kti`_vtK |



mvi gg thme Rxe tmši kw³tk ifcvs wi Z Kti Dnt`i ubtRt`i Ges Ab`vb` Rtei Rb` Lv` kw³ Drcv`b KitZ citi Zit`iK c⁰ugK Drcv`K etj | meR Dm⁰c tk c⁰ugK Drcv`K ejv nq | dvBtUv c⁰ubtKB tKvb c⁰z ev Rjvktqi Drcv`bkjy Zvi mPK intmte wePbv Kiv nq | Kve⁰BtWU intmte Dm⁰c th Lv` ^Zwi Ges Rgv Kti DntB c⁰Yt` i e⁰x I weKvtki Rb` e`euZ nq | Rj R cmi tetk c⁰ugK Drcv`tki i Zi Acwi mxg |



cvtVvEi gj`iqb 3.3

mWK DEti i cvtk UK Pý (✓) w b |

- 1/ c⁰ugK Drcv`K ej tZ mK e⁰vq?
 K• c⁰ugK chv⁰qi Drcv`bKvix
 L• mi vmi tmši kw³tk Lv` kw³tZ ifcvsli Kvi x
 M• Lv` kw³tk tft¹/₂ kw³ Drcv`bKvix
 N• Rxeb avi tYi Rb` i ayv⁰ Kve⁰ WvB A• vBv e`envi Kvi x

- 2/ ^uvBti vMvBiv tKvb⁰etMP Ašif?
 K• tUUt`^v⁰ti Bj m
 L• tKvti vKK⁰KBj m&
 M• vRMvbgvtUBj m&
 N• BDtj vUvBtKBj m&

- 3/ tKvbU mWK bq?
 K• c⁰ugK Drcv`K intmte dvBtUv c⁰ubtK tKvb Rjvktqi Drcv`bkjy Zvi mPK ejv nq
 L• mvtj vK mstk- I tYi gva`tg Dm⁰c Lv`-kw³ intmte Kve⁰BtWU ^Zwi Kti
 M• dvBtUv c⁰ub Rjvktqi c⁰bi `exfZ Av tRtbi cwi gvY e⁰x tZ mrvh` Kti
 N• dvBtUv c⁰ub c⁰zi i c⁰btZ `exfZ Kve⁰ WvB A• vBtWi cwi gvY e⁰x Kti

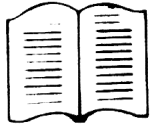
- 4/ BDvMv tKvb⁰cteP Ašif?
 K• tKvti vdvBUv
 L• BDvM- tbrdvBUv
 M• vBt⁰vdvBUv
 N• cvBti vdvBUv

cW 3.4 `ëxfZ Kwb c`v_©I Zvi cKviþf`, cwi gvYMZ I , YMZ cFve



G cW tkþI Avicb –

- `ëxfZ Kwb c`v_©Kx Ges Zvi cKviþf` Avtj vPbv KiþZ cviþeb|
- `ëxfZ Kwb c`v_©P cwi gvYMZ I , YMZ cFve eYðv KiþZ cviþeb|



`ëxfZ Kwb c`v_©

cKwZK me aiþbi cmbþZ `ëxfZ Kwb c`v_©we`gub| cmbþK meRbxb `ëK ejv nq Kvi Y Gw Ab` AþK Ziti Zþbvq tewk iKþgi `ë `ëxfZ KiþZ citi|

Zjþþki mþ_ wbioe mþúK, fþvþMi Dcwi þþi cmb cèvn, fMf' cmb Pzþbv, Rj R Rþei cPb BZ`w` weifbæfvte cKþi i cmbþZ `ëxfZ Kwb c`v_©mstþwRZ nq| Guv LgB `þfweK th weifbæRj vkþqi cmbþZ `ëxfZ Kwb c`v_©P cwi gvY Ges , Yv, Y wfbæfvbæte Ges GgbwK GKB Rj vkþq FZztþf` `ëxfZ Kwb c`v_©P cwi gvYMZ I , YMZ cv`R` cwi jwþZ nþZ citi | wdèvi KZ.cmbþK Kg Zvcgvþvq er`zxfetþi ci th i`c`v_©Aenkó _þK Dnv A%Re c`v_©P msþgkY|

`ëxfZ Kwb c`v_©K mrvai Yfvte `þfvþM fwm Kiv hvq| h_v- `ëxfZ A%Re Kwb c`v_©I `ëxfZ `Re Kwb c`v_©P

`ëxfZ A`Re Kwb c`v_©

cKwZK cmbþZ `ëxfZ AwKvsk A%Re c`v_©Rj R Rþei Dci cZ`þ ev cþivþfvte cFve tdtj | Gþ`i þKvb þKvbw AwK KvhRix fvgKv iþL| Gþ`i gþa` metþþq tewk Dþj - LþwM` KþqKwU wþP Avtj vPbv Kiv ntj v|

A%Re bvþUþRb thþM

bvþUþ bvþUþRb

weifbæRj vkþq bvþUþ bvþUþRþbi cwi gvY weifbæntq _þK Ges GKB Rj vkþq bvþUþUi NbZ; weifbængþq wfbæfvbæntZ citi | bvþUþ e`vKþUwi qv Ges bvþUþ MþYKvix Rþei mþ_ bvþUþUi thþnZymþúK`þqþQ ZvB GuU cwi gvY me mgq cwi ZþKvj | dvþUþwþUþbi eþ`i Rb` bvþUþ bvþUþRþþK GKwU Ab`Zg , iþcY`þqþþYKvix Dcv`vb (Limiting factor) wntþte weþPbv Kiv nq| þKvþi wþdj Drcv`þbi Rb` GuU GKwU cþmvaK e` wntþte cþqvRb nq| bvþUþ Kg cotj þKvþi wþdj Drcv`b eU nþq hvq|

dvþUþwþUþbi eþ`i Rb` bvþUþ bvþUþRþ GKwU Ab`Zg , iþcY` wþqþþYKvix Dcv`vb|

bvþUþ bvþUþRb

cKwZK cmbþZ bvþUþRb bvþUþ wntþteI we`gub| weþKl aiþbi e`vKþUwi qv bvþUþþK weRwi Z Kþi bvþUþ iþcþš wi Z Kþi | bvþUþ bvþUþRb AþK mgq cþ`wK Drcv`þKi Dci þwZKi cFve tdtj |

A`itgmbqvg j eY

A`itgmbqvg j eYi NbZi
teuk ntj gvtQi I ci
¶iZKi cfi'e cto|

c0kuZK cmbtZ ¶KQycwi givY A`itgmbqvg j eY `exfZ Ae`iq _vtK| Gt`i gta` A`itgmbqvg
KvefbU AwaK cwi givY cvl qv hvq| A`itgmbqvg j eYi NbZi teuk ntj gvtQi I ci ¶iZKi
cfi'e cto|

umij Kb

umij Kb c0kuZtZ gY Ae`iq cvl qv hvq bv| c0kuZK cmbtZ `exfZ umij tKU intmteI
umij Kb tKij tqW intmte _vtK| Rj vktqi wefbaZv, FZzcwi eZB, Rjvkq Awfglx c0vvnZ
cmbi c0kuZ, WvqUgti Drcv`bkxj Zv Ges Mfxi Zv BZ`w` bvbwea Kvi tY umij Ktbi cwi givY
wfbawfbentZ cvti| WvqUg bvgK GK ai tYi dvBtUvcwUvtbi tLij m`Zwi i Rb` umij Kb
c0qvRb nq| WvqUgti Drcv`b umij Ktbi c0c`Zvi I ci mivmwi wbfPkxj|

dmdim

c0kuZK cmbtZ dmdim dmtDU intmte c0z cwi givY _vktZ cvti| K`ij umqvg dmtDU
intmte teuki fVM dmdim we`gub _vtK| gwUtZ, AvKwi tK Ges Rxe t`n dmtDU
e`vcKfite we`Z| Rj vktq c0B dmdim tK `gvtM fVM Kiv thtZ cvti|
K) `exfZ dmdim dmtDU intmte _vtK Ges
L) `Re dmdim hv Rxe t`n Ges `Re c`v`e`gub|
dvBtUvcwUvtbi Drcv`b I ewx i Rb` chrB cwi givY dmdim `i Kvi nq|

Ab`vb` Dcr`vb

¶KQycwDcr`vb thgb -
K`ij umqvg, g`vMtbimqvg,
g`vZwbR, Avqib,
tmvWqvg, cUmkqvg,
mij dvi, Kcvi BZ`w`
cmbtZ `exfZ i vmqubK
thstMi Dcr`vb intmte
e`euZ nq Ges th fiteB
trvK bv tKb Rj R
cwi t`tki I ci , iZcY`
cfi'e tdtj |

Zv Qvor Avi I AtbK A`Re c`v`cmbtZ `exfZ _vtK| Gt`i cwi givY Lg Kg Avevi Lg
teukI ntZ cvti| ¶KQycwDcr`vb thgb - K`ij umqvg, g`vMtbimqvg, g`vZwbR, Avqib,
tmvWqvg, cUmkqvg, mij dvi, Kcvi BZ`w` cmbtZ `exfZ i vmqubK thstMi Dcr`vb intmte
e`euZ nq Ges th fiteB trvK bv tKb Rj R cwi t`tki I ci , i`ZcY`cfi'e tdtj | Gt`i
tKvb tKvbu Drcv`bkxj Zvi c0ZxK intmte wefepZ ntq _vtK|

c0ZwU meR Dv`i Rb` K`ij umqvtgi c0qvRbxZv itqtQ| K`ij umqvg Dv`i tKvli GKwU
Avek`Kxq Ask| GwU Ab`vb` Avqitbi c0c`Zvq mrvqZv Kti| g`vMtbimqvg tKv`i vdtj i
GKwU Ask Ges tKv`i vdtj Drcv`tbi Rb` GwU Aek`B cmbtZ we`gub _vktZ nte| Dv`i
ewx I weKv`tki Rb` Avqitbi c0qvRb itqtQ| GwU tKv`i vdtj Drcv`tbi AbvUK intmte
KvR Kti _vtK| tmvWqvg Dv`i ewx I weKv`tki Rb` mivmwi `i Kvi bv ntj I GwU GKwU
AZ`š Kvr LZ Dcr`vb| tmvWqvg cUmkqvtgi msi ¶K intmte KvR Kti| GwU gwUtZ
wekwl Z cUmkqvtK Dv`i Rb` mnR c0c` Kti|

`exfZ `Re Kivb c`v`

RweZ c0Yxi Dv`O Ges
gZt`n cmbtZ `Re c`v`
thvMvtbi c0vb Dm|

Rj vktqi Af`šfi Ges ¶Kbri vq wefbaRxei Dcv`wZ Rj vktqi cmbtZ Aweivg `Re Kivb
c`v`mieivn Kti _vtK| Gt`i ¶KQyAsk cmbtZ `exfZ nq| KvR RB c0kuZK me cmbtZ B
¶KQycwivg `Re c`v`we`gub| RweZ c0Yxi Dv`O Ges gZt`n cmbtZ `Re c`v`
thvMvtbi c0vb Dm| Rj vktqi cmbtZ thfnZz cvwUv I Ab`vb` c`v`gwkZ Ae`iq _vtK
ZvB `exfZ `Re c`v`e`tk- IY Kivi Rb` cmbtK c0tg tmvUvdDR Kitz nte A`ev tKvb
KivRix wdevi e`enri Kti G mg`I `Re c`v`e`wZ Kitz nte|

Kul. I cj-x Dbqb -x

`exfZ `Re Kwb c`v_P cKvitf`

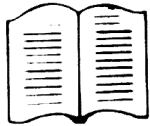
wefbæi Ktgi Ges wefbæKih^{m=uv} bKrix `Re Kwb c`v_@itqQ GtZ tKib m^tn tbB/
wb^tP KtqKwU `Re Kwb c`v_@btq Avtj vPbv Kiv ntj v|

`exfZ `Re bvtUtRb

wefbæRj vktq wefbæcwi gvtY `exfZ `Re bvtUtRb cvl qv hvq| `exfZ `Re bvtUtRtbi
gta" A^vgvBt^{bv} GimWI _vtK|

`exfZ `Re KveB

`exfZ `Re KveB wefbæivmqubK thstMi Avek"Kxq Dcv`vb intmte _vtK| tcUUb, wj ucW
I Kvte^{hv}BtW^tUi Ask intmte cmbtZ _vtK| cmbtZ th cwigvY bvtUtRb _vtK Zvi 6.25
_Y nt"Q tcUUb| tcUUb Kve^{bi} cwigvY kZKiv 53 fivM, Kvte^{hv}BtW^tU kZKiv 45 fivM
Ges wj ucW kZKiv 75 fivM|



migg^t cKwZK cmbtZ `exfZ A%Re I `Re Kwb c`v_@we`gib| wefbæRj vktqi
cmbtZ `exfZ Kwb c`v_P cwigvY Ges _Yv_Y wfbærfbæq| A%Re bvtUtRb thSM thgb
bvtUtU bvtUtRb, bvtUtBU bvtUtRb, A^vtgvbqvg jeY, wuj Kb, dmdivm, BZ w`
`exfZ A%Re Kwb c`v_@Ges `exfZ `Re bvtUtRb, `exfZ `Re KveB ntj v `exfZ `Re
Kwb c`v_P cKwZK cmbtZ `exfZ Gme Kwb c`v_@Rj R R^tei I ci cZ"¶| ev ctiv¶|
cFve tdj |



cuVvEi gj`iqb 3.4

mWk DEti i cuK wK wPy (✓) w b|

- 1/ `exfZ KwVb c`v`ej tZ wK eSvq?
- K) cmbtK tmwUildDR Ki tj th Zj vbx cti
 - L) cmbtK wdèvi Ki tj wdèvi htš;hv tj tM _vK
 - M) cmbtK Aí ZvcgvÎvq ev®úxfeb Ki tj hv Aewkó _vK
 - N) cmbtK Awk ZvcgvÎvq ev®úxfeb Ki tj hv Aewkó _vK
- 2/ A%Re bvBtUtRtbi gta` Dw`c tKvbtU Awk MhY Kti _vK?
- K) bvBtUtRb (gš)
 - L) bvBtUU bvBtUtRb
 - M) bvBUtBU bvBtUtRb
 - N) A`itgmbqig j eY
- 3/ wmi K b tKvbtUvcwUtb Rb` tenk cšqvRb nq?
- K) WvqvUg
 - L) BDwMbv
 - M) gvBtµwmióm
 - N) `úvBti vMvBi v
- 4/ KitehvBtWtU kZKiv KZ fM Kveš _vK?
- K) 35
 - L) 53
 - M) 75
 - N) 45

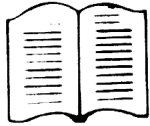
e˘enwiK

cW 3.5 cwi A˘Z; I ˘vi Z; iY˘



G cW tk˘I Avcb –

■ cwi A˘Z; I ˘vi Z; iY˘ Ki˘Z cvi˘eb/



c˘m˘K Z_˘

nvBtWtRb Avqb (H⁺) Nb˘Z; j FvZK j MtK (-log) ˘cGBP (p^H) etj | tkvb Rjvktqi p^H Aa˘qb K˘i Dnvi cwi A˘Z; I ˘vi Z; iY˘ Kiv nq/ p^H 1- 14 GB t˘˘j i gta˘ weivR K˘i | p^H 7 ntj Hcwb˘K wDU˘j ev c˘kg ejv nq/ p^H 7 Gi Kg ntj A˘Z; I 7 Gi tenk ntj ˘vi Z; c˘vk K˘i | p^H ˘v˘te wY˘ Kiv th˘Z c˘i t

nvBtWtRb Avqb (H⁺)
Nb˘Z; j FvZK j MtK
(-log) ˘cGBP (p^H)
etj |

- 1) Kj wi˘guUK (w˘˘ RK) c˘wZi gva˘tg
- 2) B˘j KU˘bK p^H ˘guvi ˘vi v

Kj wi˘guUK c˘wZ

tkvb tkvb ˘re th˘tMi PZ˘u˘k˘p gva˘tg p^H cwi enZ˘ ntj Dn˘˘ i eY˘cwi enZ˘ nq/ h˘ tkvb w˘˘ w˘˘ RK c˘˘˘K weivbap^H m˘˘baevdvi ˘˘Y th˘M Kiv nq Zvntj c˘ZiU p^H Gi Rb˘ GKiu w˘˘ ˘ eY˘cvi qv h˘te/ m˘vavi Y˘v˘te c˘c˘ w˘˘ RK c˘˘˘˘ w˘˘ ˘ p^H m˘gv i˘tqQ/ K˘tRB w˘˘w˘˘w˘˘ RK e˘enwi K˘i ÷ v˘w˘˘˘˘ ˘Y ˘Zwi Kiv˘Z n˘te/

Kih˘˘j x

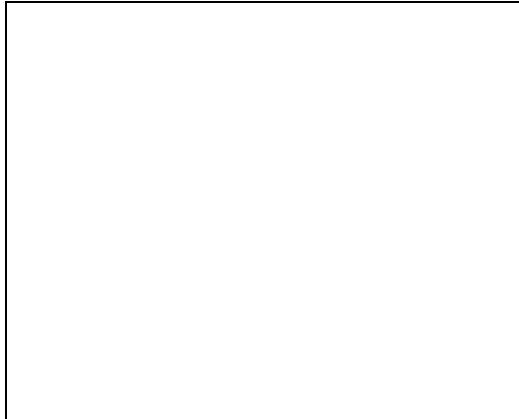
- 1˘ weivbap^H Gi ÷ v˘w˘˘˘˘ evdvi ˘˘Y w˘˘/
- 2˘ weivbap˘ RK c˘˘˘ (Indicator) w˘˘w˘˘w˘˘˘˘ Gi m˘v˘w˘˘˘˘ evdvi ˘˘Y th˘M Ki˘j/
- 3˘ w˘˘˘ RK ˘˘Yi cwi enZ˘ eY˘˘vU Ki˘j/
- 4˘ bg˘v cwb˘Z w˘˘˘ RK ˘˘ th˘M Ki˘j/
- 5˘ cwi enZ˘ eY˘c˘e˘˘ v˘w˘˘˘˘ ˘˘Yi t˘t˘ c˘˘ eY˘Gi m˘˘˘ w˘˘j t˘ t˘ L˘j/
- 6˘ p^H Rv˘ th ˘˘Yi m˘˘˘ c˘i˘w˘˘Z cwi eY˘˘tj h˘te Dn˘B H cwi p^H w˘˘t˘te MY˘˘ n˘te/
- 7˘ Kih˘˘j x Avcbvi e˘enwi K LvZvq w˘˘ tL mgqgZ w˘˘U˘i˘K t˘˘L˘t˘ ˘˘j i w˘˘/

g˘˘˘

G c˘wZ L˘j tenk w˘˘˘ dj t˘˘q b˘v/

Btj KUibK p^H ugUvi

tKvb `etY ubgW%Z `jtlv Btj KtUttWi mvt_ Btj KtUingUvi msthvM Kti p^H cwi gvc Kiv m=et| evRvti Btj KtUibK p^H ugUvi ukbtZ cvl qv hvq| G hšj e`envi Kti Lg mntRB mivKfvt p^H cwi gvc Kiv m=et (wPÎ 20)|



wPÎ 20 t Btj KUibK p^H ugUvi

Kih@Vj x

- 1| p^H ugUvti i Btj KtUW cwiZZ cmb w`tq cwi@vi Kily
- 2| Btj KtUW Rvbr p^H Gi `etY cdek Kivb|
- 3| K`vij tek b tgW (Mode) Gi tevZvtg Pvc w`tq uba@vi Z ÷ vUWw^H-G hšjU K`vij tetU Kily|
- 4| th cmb ev `etYi p^H ubY@ Kiteb Dnv tKvb cwi@vi meKvi ev dvf`c ubb|
- 5| Gevi p^H ugUvti i Btj KtUWwU H meKvti ev dvf`c cmbtZ ev `etY cdek Kivb Ges GKUzbrvPror Kily| H `etYi p^H hšjUi tQvU gubUti t`Lv hvte|
- 6| p^H Rvbr ntq tMjt Btj KtUW meKvi t`tK tei Kily Ges cwiZZ cmbtZ cwi@vi Kti Btj KtUttWi Rb` uba@vi Z meKvti p^H 7 evdvti tittL w`b|
- 7| Kih@Vj x avi vevnKfvt Avcbri e`enmi K LvZvtq wj nce x Kily Ges wDUi tK mgqgZ t`wLvtq `vji ubb|

gšé`

tKvb Rjvktqi cmbi p^H hv` 7 Gi wbtP nq Zvntj Rvbt eb H Rjvktqi cmb A=0Ges hv` 7 Gi tev nq Zvntj Rvbt eb Dnvi cmb vjvixq Avi hv` 7 nq Zvntj ešteb cmb wDUij ev ckg|

- 7) dvBtUv c04Ub I Ry c04Ub kbr3 Kivi Rb" WKQyÔliterature' AvtQ tm,tjvi mstM
wgij tq c04Ub kbr3 Kily|
- 8) wPÎ 22 Ges 23 G KtqKwU iZcy0I mivari Yfvte c0B dvBtUv c04Ub I Ry c04Ub
t`Lvfbv ntjv| GB wPÎ mgfni mvf_ wgij tqI c04Ub kbr3 Kitz cri teb|
- 9) Kiv0Vij x Abjvqx c04Ub kbr3 Kily Ges e`enwvi K LvZvq Qwe GtK h_vmgdq wUDUi tK
t`wLdq`vji wbb|



wPÎ 22 t KtqKwU wbePZ dvBtUv c04Ub

Kul. I c j x Dbqb 7z



PT 23 t KtqKw ubenPZ Ry cU/Ub



Povšgij`vqb

msvB I i Pbigj-K ckae

- 1| Rj vktqi cmbi eYq MÜ m=Ü Avtj vPbv Kily|
- 2| cktzi i cmbi cwi gvY ubYq c×wzi eYbv Kily|
- 3| cktzi i cwi tek I Kr`vi , Yv, Y ej tZ Kx eSvq Zv wj Lly|
- 4| cktzi i cmbi tfSZ Ae`vmgn Avtj vPbv Kily|
- 5| cktzi i cmbi i vmiqubK , Yv, Y mgtni eYbv Kily| cmbi tfSZ I i vmiqubK `enkó`mgn Kxfvte cÜ_wgK Drcv` btk cfwmeZ Kti Avtj vPbv Kily|
- 6| cÜ_wgK Drcv` K dvBtUv cW4Utb i tkYweb`vm wj Lly|
- 7| cÜ_wgK Drcv` tKi , i z; Avtj vPbv Kily|
- 8| cmbtZ `exfZ KwWb c`v`ej tZ Kx eSvq? weifbæaitbi `exfZ KwWb c`v`m=Ü Avtj vPbv Kily|
- 9| cktzi i Drcv` bkxj Zvq `exfZ KwWb c`v`mgtni cfw eYbv Kily|



DËigjv

cW 3.1

- 1| K 2| L 3| M 4| N 5| L

cW 3.2

- 1| N 2| M 3| L 4| K

cW 3.3

- 1| L 2| M 3| N 4| L

cW 3.4

- 1| M 2| L 3| K 4| N

BDubU 4 gvQ Pvl

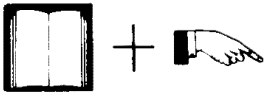
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LvBq gvQ i Pvl, tPsev`Pvq gvQ i Pvl Ges mgisZ gvQ i Pvl AvabK grm` Pvl chny`i tek KZ`_tjv bZb`w`K| avb t`f`fZ gvQ i Pvl A`bK cjuZb ntj I Avgv`i t`tki Rb` bZb| evsjv`tki g` Rj vktq`_tjvi e`e`rcbv AZ`sl`_i`z`c`y` KviY Avgv`i t`tki grm` Drcv`b i msnf`MB Avtm g` Rj vktq t`_tk| Av`Kvi qvq gvQ Pvl tmsl`b e`rcvi ntj I eZ@vb Gi evY`R`K`_i`z`i`i`q`q`| MZ GK`_ktK Av`Kvi qvq e`emv tek fij frte we`fz` jvf Kti`q`|

G BDubU c`kzi gvQ Pvl i c`U`ugK vbY@K, cRmiz ubePb, gvQ Qvovi AvbgmZK nvi, gvQ Qvovi ubqvej`x, GKK Ges ugkPvl, LvBq, tPsev`Pvq Ges avb t`f`fZ gvQ Pvl, mgisZ gvQ Pvl, g` Rj vktq e`e`rcbv, Av`Kvi qvq gvQ cvj b c`x`iz, Pvl vct`h`Mx t`kx I wef`kx gvQ kbr`KiY m`u`tk`e`-`wi Z Avtj vPbv Ki v ntq`q`|

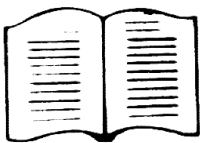
cW 4.1 c`kzi gvQ Pvl i c`U`ugK vbY@K, cRmiz ubePb Ges gvQ Qvovi AvbgmZK nvi

G cW tk`I Avcib`-



- c`kzi gvQ Pvl i c`U`ugK vbY@K eY@v KitZ cvi`teb|
- gvQ Pvl i Rb` cRmiz ubePb i c`U`Rbxq`_euk`o`mg` Avtj vPbv KitZ cvi`teb|
- Avak Drcv`b i Rb` gvQ Qvovi AvbgmZK nvi vbY@K KitZ cvi`teb|

c`kzi gvQ Pvl i c`U`ugK vbY@K



c`kzi i gml I cmbi ub`m`j`uLZ`_f`fZ` I i vmvqubK Dcv`vbmgr` I m`h`f`j`vK gvQ Pvl i Rb`_i`z`c`y`vbY@K|

- 1| gml - c`avbZ`_g`E`Kvi`_Mvb I uc`_GBP|
- 2| cmb - Mfxi Zv, `QZv, Zvcgvi`v, `exfZ`_Av`_fRb, `exfZ`_Kve@-Wvb A`_vBW, uc`_GBP, dmt`dU, vbB`t`UU, Li Zv BZ`w` |

gml

GtUj I t`v`Avk`_gml i c`kz`_gvQ`_Pvl i Rb`_m`tef`Eg| c`kzi i gml ubi`tc`q` ev`_fvi`agr`ntj`_gvQ i Drcv`b`_teuk`_nq| GtUj I t`v`Avk`_gml`_tZ`_RueK`_c`v`_e`teuk`_v`tk`_etj`_Gme`_gml`_teuk`_DeP`_nq| GtUj I t`v`Avk`_gml i cmb`_avi`Y`_f`g`Zv`_teuk`| ubi`tc`q`_gml i uc`_GBP`_v`tk`_7| ubi`tc`q` I`_fvi`agr`gml`_gvQ`_Pvl i Rb``_teuk`_Dc`h`Mx|

GtUj I t`v`Avk`_gml i c`kz`_gvQ`_Pvl i Rb`_m`tef`Eg|

cwb

cKzi i cwbB gvtQi evm`vb ev cwi tek | cKzi i cwb i Yv, tYi I ci gvtQi epX Z_v gvtQi Drcv`b wekl fite wbfPkj | cKzi gvtQi Prtli Rb` cwb GKIU , iZcYc0_ugK ubYqK | cwb i tFz I i vmiqbK Dcr`vbmgr`wbz`ewYZ ntj v t

cKzi i cwb Mfxi Zv 2 ugUvti i KvQvKwQ ntj gvtQi Prtli Rb` fvj |

Mfxi Zv t cKzi i cwb Mfxi Zv 2 ugUvti i KvQvKwQ ntj fvj nq | Gi tPtq tewk Mfxi ntj cKzi i Zj vq `RweK c`v`Rtg cPtZ i iYKti Ges Gi dtj KveBvBA` vBW, Gtgnbqv, ug`_b, nvBtWtRb BZ`w` weLv³ M`vm `Zwi nq | Gme M`vm gvtQi Rb` qWZKi |

`QZv t `Q cwbZ mntR AtpK Mfxi Zv chS`mh`j vK tcStQ | Gi dtj cwbZ cPz Dv`c cWUb (phytoplankton) Drcbenq hv gvtQi Lv` | cwb i `QZv 25-30 tm. ug. nI qv evAbxq |

Avgt`i t`tki gvtQi epX i Rb` mekaK AbKj ZvcgvIv ntj v 28-32^o tmj wqum |

ZvcgvIv t gvtQi Prtli Rb` cwb i ZvcgvIv AZ`sl , iZcYc0 ZvcgvIvi mt`_ gvtQi t`tni epX i nvi cZ`qfite m`uK`j | cwb i ZvcgvIv evotj gvtQi epX i nvi evto | Avevi cwb i ZvcgvIv Kgtj gvtQi epX i nvi Ktg | Avgt`i t`tki gvtQi epX i Rb` mekaK AbKj ZvcgvIv ntj v 28-32^o tmj wqum | ZvcgvIvi Kvi tYB eI`Kvtj Avgt`i t`tk gvtQi Drcv`b tewk nq Ges kvZKvtj Kg nq | Avgt`i t`tk tg gvm t`tk Atpvei gvm ntj v gvtQi Prtli mtefEg mgq |

Aw tRtbi Afve ntj gvtQi Lwe Lrq | A`f fvtZ `vtK I evZvm MhY Ki tZ `vtK | Aw tRtbi Afite gvtQi gvi v tMj gZ gvtQi nv Kti `vtK |

`xfZ Aw tRb t gvtQi Prtli Rb` Aw tRtbi Kv`LZ NbZj ntj v Kgc`q 5 ug.Mh./uj Uvi | hLb cwbZ Aw tRtbi NbZj 18 ug.Mh./uj Uvi G tcStQ, ZLb gvtQi eyeY ev gas embolism tivM nq | th me cKzi Awak cwi gvtY Wzsl Dv`c `vtK tmme cKzi AwZwi³ Aw tRb `xfZ nq | Aw tRtbi Afve ntj gvtQi Lwe Lrq | A`f fvtZ `vtK I evZvm wMj tZ `vtK | Aw tRtbi Afite gvtQi gvi v tMj gZ gvtQi nv Kti `vtK |

`xfZ KveB-WB A` vBW t mtj vK mstk- I tYi Rb` cwbZ `xfZ KveB-WB A` vBtWi c0qvRb nq | wKs`hw` Gi NbZj 5 ug.Mh./uj Uvti i I cti Dtv ZLb gvtQi qWZ M0`nq | G mgq hw` cwbZ Aw tRtbi Afve Ntu Zv ntj gvtQi kjb KvR Amyeav nq Ges gvtQi ev`cK nvti gvi v thtZ cvti | cKzi `Re c`v`vKtj tewk KveB-WB A` vBW `Zwi ntZ cvti |

gvtQi cKzi cwb i wC.GBP. Gi cwi mi 6.5-9 `vKv DvPZ |

wC GBP t gvtQi Prtli Rb` cwb i wC. GBP 4-9.5 c0qvRb | Zte wC. GBP Gi cwi mi 6.5-9 gvtQi Prtli Rb` mtefEg | cwb i wC.GBP. hLb 7 G `vtK ZLb ZvtK wbt`c`q etj | cwb i wC.GBP Kg `vKtj Pz c0qvM Kti Zv evotv hvq |

dmtdU t cwbZ c0qvRb gZ dmtDU bv `vKtj tklj v ev Dv`c cWUb fvj fite Rb`tZ cvti bv | hw` cKzi i cwbZ 0.10-0.20 wC.wC.Gg. NbZj dmtDU i vLv hvq Zvntj gvtQi Drcv`b evto |

bBtU t cKzi i cwbZ gvtQi Awak Drcv`b tctZ ntj cwbZ bvtU`Ui NbZj i vLtz nte 2.0 ug.Mh./uj Uvi |

LiZv t tKvj cwb i tPtq Li cwbZ gvtQi Drcv`b tewk nq | cwb Li Zv 25 ug.Mh./uj Uvi ev Zvi tPtq Dcti ntj cKzi gvtQi Drcv`b Awak nq |

Kul.1 c j Dbaqb ħ

mviW-1 G gvQ Pti i Rb" iBYqKmgtni meAaK AbKj (Optimal) Ae-vi ZwiJ Kv c0vb Kiv ntaqQ|

mviW 1 t gvQ Pti i Rb" iBYqKi meAaK AbKj Ae-v|

iBYqKi big	meteg Ae-v
gvU	Gtlj , tAvk, ubitcŋ ev ŋvi xq
cmbi Mfi Zi	2 ugUvi
QZv	25-30 tm: ug:
Zvcgvv	28 - 32 ⁰ tm:
exfZ Av tRb	5 ug.M0./wj Uvi ev Dcti
exfZ KieB-WiB A. vBW	5 ug.M0./wj Uvi ev Zvi iBtP
uc.GBP.	6.5 - 9
dmtdU	0.10-0.20
bvBtUU	2.0
Li Zi	25

gvQ Pti i Rb" cRwZ iBePb

mivK cRwZ iBePb KitZ cvi tj iBv 0 mgtqi e'earfb ev eQti c0Z GKK cmbtZ gvtQi Drcv b epx cvq| evRvti th me cRwZi Pwin v tevk tm me cRwZ Pvl Kitj Drcw Z gvtQi wep q gj tevk nq|

mivK cRwZ iBePb
KitZ cvi tj iBv 0
mgtqi e'earfb ev eQti
c0Z GKK cmbtZ gvtQi
Drcv b epx cvq|

Pti i Rb" cRwZ iBePb i mgq iBaj uLZ 'enk0 , tj vtK ietePbrq AvbtZ nte t

- evRvti th me cRwZi Pwin v tevk|
- Pti i cvi tetk th me cRwZi eab nvi tevk|
- AaK NbZj th me cRwZi 'fweK eabnvi I evBri nvi tevk|
- th me cRwZ mntR tivM Avpvrš nq bv|
- th me cRwZ Di^mc c0UbtFvRx ev mePK|
- th me cRwZi t' n e'envi i DcthvMx tevk gism vtK|
- th me cRwZi tcvb mntR Drcv b Kiv hvq ev cvl qv hvq|
- th me cRwZ t' ni I Rtbi Zjbrq Kg niti Lv MhY Kti |
- th me cRwZ Kg t0Ubhŋ Lv' 'fweK fite epx cvq|
- th me cRwZi gvQ myr Ges ht_0 c0gib m=ub0

gvQ Qvovi AvbzwZK nvi

gvQ Qvovi mgq mivK AvbzwZK nvi iBYq KitZ cvi tj gvtQi Drcv b tevk nq| Kvi Y Gi dtj cKzi i me0ti i Lv' i m0'envi nq Ges Lv' i Rb" c0ZthwMzv Ktg|

gvQ Qvovi mgq mivK
AvbzwZK nvi iBYq
KitZ cvi tj gvtQi
Drcv b tevk nq|

ZiB AaK Drcv tbi Rb" 1 kZistki GKiu cKzi mviW-2 Abjvqx gvtQi tcvb QvotZ nte|

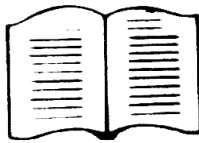
mviwY 2 t cÖZ kZvstK newfbagvtQi tcvbv Qovvi nvi |

gvfQi big	th`ti Lv` MhY Kti	gvfQi mSL`v
KvZjv	Dctii`i	6
imj fvi Kvc	Dctii`i	8
iB	ga`i	6
gMj	wbPi`i	3
ugii Kvc	wbPi`i	3
Kgb Kvc®(KvncP)	wbPi`i	4
Mhm Kvc	newfba`i	1
ivRcvj	newfba`i	1
meqvu		32



Dctii`i
wbPi`i
gvfSi`i
wbPi`i

IPt 24 t newfba`ti newfbacRwZi gvQ



Ablyj b (Activity) t aly, Avcbvi GKwU cKz AvtQ hvi AvqZb 0.5 tn±i | H cKzWtZ Avcb KvZjv, imj fvi Kvc, iB, gMj, ugii Kvc®I ivRcvj Qovvi K_v fvefQb | tKvb& gvfQi tcvbv KZwU Qovteb Zvi mSL`v Dvj LceR GKwU mviwY `Zvi Kily |

mvi gg®t GtUj I t`veAvk gwU gvQ Prtli Rb` mefPtq fvj | gvQ Prtli Rb` 2 ugUvi Mfxi Zvi cKz tek DcthmI cKz tek Mfxi ntj gvfQi Rb` qWZKi | Prtli cKzi cmbi `QZv 20-25 tm. ug. nlqv DvPZ | gvQ Prtli cKzi cmbi ZvcgvIv 28-32⁰ tmjmqum _vKv DvPZ | gvQ Prtli cKzi cmbi `exfZ Av tRtbi NbZ; Kg ctq 5 ug.MØ./vj Uvi _vKv DvPZ | cmbtZ KveB-WvB A. vBtWi mtePP NbZ; 5 ug.MØ./vj Uvi _vKv DvPZ | gvfQi cKzi cmbi uc. GBP 6.5-9 Gi wfZI _vKv DvPZ | Prtli Rb` fvj _Y mæbæcRwZ wbarPY Kiv DvPZ | KvZjv, iB, imj fvi Kvc, gMj, Kgb Kvc, Mhm Kvc, ivRcvj BZ`w gvQ wgvPrtli Rb` e`envi Kiv DvPZ |



cuVvEi gj'iqb 4.1

mWK DEti i cuK WK iPy (✓) w b/

- 1/ gvQ Prtli Rb" tKvb&gvUj cKž mteEg?
K) teŕj gvU
L) jvj gvU
M) GtUj I t`veAvk gvU
N) jvj I A=gvU

- 2/ cmbi ZrcgvIv evotj gvQi epxi nvi Kx nte?
K) Ktg hvq
L) w`i _vK
M) evto
N) evto Ges Ktg

- 3/ gvQ Prtli Rb" Kgcŕŕ `erfZ Av tRtbi NbZ;KZ _vKv DvPZ?
K) 2 ug.Mŕ./vj Uvi
L) 5 ug.Mŕ./vj Uvi
M) 6 ug.Mŕ./vj Uvi
N) 6.5 ug.Mŕ./vj Uvi

- 4/ gvQ Prtli Rb" cmbi wc.GBtPi mteEg cwi mi KZ?
K) 4-10
L) 5.5 - 9.5
M) 6.5 - 9
N) 7-9

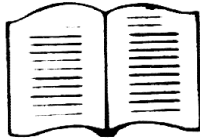
- 5/ cŕZ kZvstki cKzi meŕgvU KZuU gvQ Qrov DvPZ?
K) 30 uU
L) 25 uU
M) 32 uU
N) 22 uU

cw 4.2 gvQ Qivov i bqqvej x, GKK Ges igkPvl



G cw tkłI Avcib -

- gvQ Qivov i bqqvej x eYbvi KiłZ cviłeb|
- gvłQi GKK Pvl m=utk`e`vL`v KiłZ cviłeb|
- gvłQi igk`Pvl m=utk`Avtj vPbv KiłZ cviłeb|



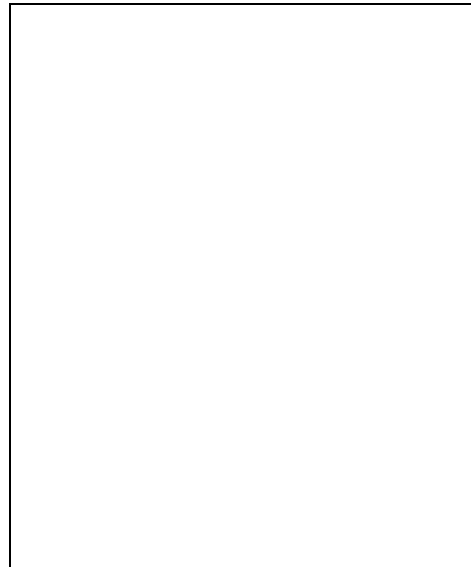
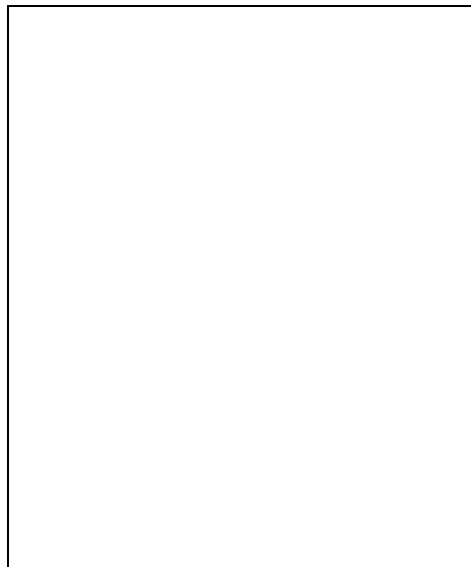
tcvov Qivov i bqq

cłkzi i cmb hLb meR ntq Dtv ZLb cłkzi gvłQi tcvov Qivov DvPZ| eZgıtb ersj vt`tk tcvov enb Kivi Rb` nıno I Av` tRb hıř cıj`_b e`vM e`enıvı Kiv nq| Zte Av` tRb hıř cıj`_b e`vM tcvov enb Kiv mełPıq fıj` e`AvnbK cšv| hı` nıno v`ıq tcvov enb Kiv nq Zv ntj cłıg nınoıU cłkzi i cmbıłZ bıgvıłZ nte Ges nınoı Mjv chšı cmbıłZ 30 ıgıbu Kvj Wıetq ivLıZ nte| Gici nınoı AıaR cmb cłkzi i cmb v`ıq e`j KiłZ nte Ges GKB Ae`ıq Avı I 20 ıgıbu mgq ivLıZ nte| Gi ci nınoı KvZ Kti nınoı gıy cmbıłZ ivLıZ nte| G Ae`ıq nıno t`_tk tcvov cłkzi i cmbıłZ Pıj hıte| (ıPı - 25)

Av` tRb³ cıj`_b e`vM tcvov cıv enb Kiv mełPıq fıj` e`AvnbK cšv|

cıvıı cmb I cłkzi i cmbı Zıcgıvı gvłS Lıy teık cv`R`_vKıj tcvov e`vcK nıvı gvıv hıq| cłkzi tcvov Qivov DEg mgq ntjv mKıj teıv|

hı` tcvov cıj`_b e`vM enb Kiv nq Zv ntj cłıg e`vMıU gıy erav Ae`ıq cłkzi i cmbıłZ 30 ıgıbu Kvj Wıetq ivLıZ nte| Gici e`vMı gıy cmbı Dctı tııL LıjıłZ nte Ges cłkzi i cmb Qıvıv e`vMı AıaR cmb e`j KiłZ nte| Gici e`vMı gıy Dctı tııLB e`vMı evKx Ask 20 ıgıbu Kvj cmbıłZ Wıetq ivLıZ nte| Gici e`vMı gıy cłkzi i cmbıłZ Wıetq atı ivLıZ nte| tcvov cłkzi i cmbıłZ Pıj hıte| G c`ııZ AbıııY Kiv nq cıvıı cmbı Zıcgıvıv cłkzi i cmbı Zıcgıvıv mgZıq Avbıvı Rb`| cıvıı cmb I cłkzi i cmbı Zıcgıvıv gvłS Lıy teık cv`R`_vKıj tcvov e`vcK nıvı gvıv hıq| cłkzi tcvov Qivov DEg mgq ntjv mKıj teıv| Gmgq cłkzi i cmbı VıÜv`_vKı| (ıPı - 26)



ıPı 25 t tLıjv cıvı ntz tcvov Qivovı c`ııZ

ıPı 26 t cıj`_b e`vM ntz tcvov Qivovı c`ııZ

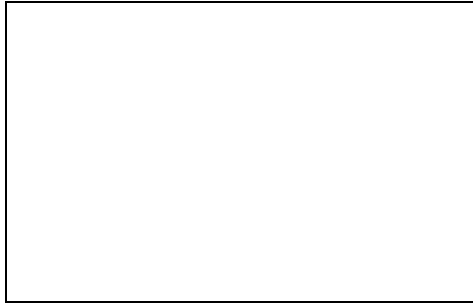
GKK Pvl

hLb tKvb Rjvktq i'ay gvi GKU cRmZi gvQ Pvl Kiv nq ZLb ZvtK gvtQi GKK Pvl etj | GKK Pvl wbeo Pvl i tejvq teik e'envi Kiv nq| Avgvt`i t`tk ivRcy, gv, i | cvsMvtmi GKK Pvl Kiv nq| Zte G,tjvi gvtS ivRcy GKK Pvl mnR I jvfRbK|

hLb tKvb Rjvktq i'ay
gvi GKU cRmZi gvQ
Pvl Kiv nq ZLb ZvtK
gvtQi GKK Pvl etj |

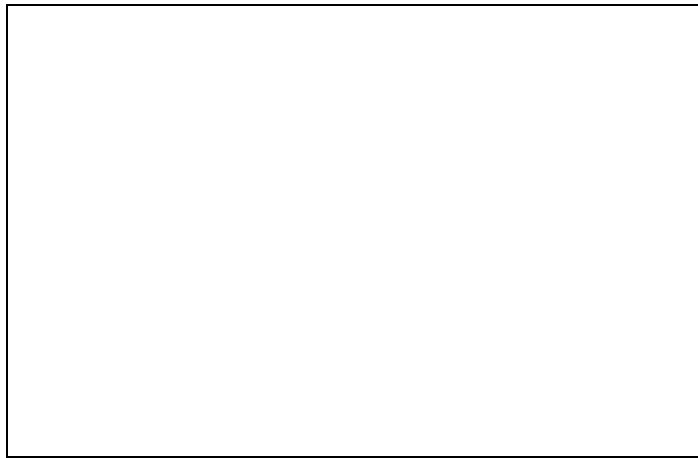
ivRcyi GKK Pvl

ivRcyi Ab` bvg ntjv _vB micv| _vBj`vU ntZ G gvQ Avgvt`i t`tk Avg`wb Kiv ntqtQ| GK kZvsk ntZ i'iyk`ti GK GKti cktzi I ivRcyi GKK Pvl Kiv hvq| kxZkvj cktz i'vktq qmZKi tcvKv-gvKo, gvQ I AvMvQv mwi`tg tdj`z nte| hv` cktz i'Kvtrv m`e bv nq Zv ntj KxUvkk, ti`vUbb ev dmUw b e'envi Kti qmZKi Rxe tgti tdj`z nte| Gi ci cZ kZvst`k 1 tKvR Kti Pz cQvM Ki`z nte| Pz i'Kbv ev cmb fiv`z cktzi e'envi Kiv th`z cvti| Pz t`lqvi ci cmbi MfxiZv 1-1.2 ugUvi Zj`z nte| Pz cQvMi 3-4 w`b ci cZ kZvst`k 3-4 tKvR tMvei A`_ev 2 tKvR gvMmi wov` cQvM Ki`z nte| Gi 6-7 w`b ci cZ kZvst`k 100 Mtg BDwiqv Ges 200 Mtg wU.Gm.wc. e'envi Ki`z nte| BDwiqv I wU.Gm.wc. cU`tg tKvb cvt` ,tj wbt`z nte Ges Zvici wUwtq mviv cktzi cQvM Ki`z nte (wP` t 27, 28, 29)|



wP` 27 t cktzi Pz cQvM c`wz

wP` 28 t cktzi `Re mvi cQvM c`wz



wP` 29 t cktzi i'vqvbk mvi cQvM c`wz

mvi cQvMi 4-5 w`b ci cktzi i'cmb meR ntq hvte| ZLb cZ kZvst`k 5-8 tm.wg. `N` 60 - 65w tcvb Qvot`z nte| tcvb Qvovi ciw`b t`tk mviw-3 Abvrti m`u`i-K Lv` cQvM Ki`z nte|

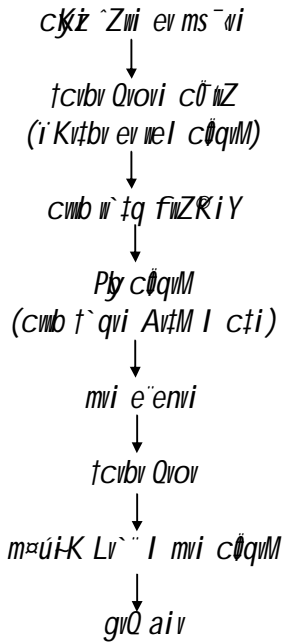
mviwY 3 t cōZ kZvstK tcvbv Qvovi ci t_#K m=úit-K Lv` cōqvMi cwi gvY|

gvm	cōZw`#bi Lv` (Mg)
1	40
2	90
3	170
4	215
5	250
6	300

PvDtji Kzv, Mtgi Fw, qjz` cwbv, big Nvm, tkIjv BZ`w`#K ivRcwi Lv` wntmte e`envi Kiv hvq|

PvDtji Kzv, Mtgi Fw, qjz` cwbv, big Nvm, tkIjv BZ`w`#K ivRcwi Lv` wntmte e`envi Kiv hvq| m=úit-K Lv`i cvkvcwk 15 w`b ci ci cōZ kZvstK 1 tKwR gjwMi weōv I 2 tKwR wFRv tMvei e`envi KitZ nte| G wbgq AbwiY Kitj 3-4 gvtm gvtQi `N` nq 20-25 tm. wq. Ges IRb nq 100-200 Mg| meqvu Drcv`b `wte cōZ kZvstK 150 tKwR|

GKK P#I i Rb` AbwiYwq GKwU Pw@b#P cōE ntj v



hLb cōzi gvtQi GKwaK cRwzi GKtI Pvl Kiv nq ZLb ZvtK gvtQi wqk^Pvl etj |

wqk^Pvl
 hLb cōzi gvtQi GKwaK cRwzi GKtI Pvl Kiv nq ZLb ZvtK gvtQi wqk^Pvl etj | wqk^Pvl gvQ P#I i GKwU AvwqK c#wZ| cōzi wefbw`#i i Lv` I evm`#bi cYmθ`envi Kti gvtQi Drcv`b evov#vB Gi Ab`Zg D#k`| th me cRwz GtK Actii mt_ Lv` ev evm`#bi Rb` cōZthwMZv Kti bv tm me cRwzi wqk^Pvl Drcv`b fvj nq|

Kul.1 cju Dbqob ֆ

ւղկ՝Քրժի Rb՝ մւււ eՉի
 շխժի շմբ իւււժ շւիժ
 ֆիյ ռղ| Շէ 8-9 ցւմ
 շմբ լւժի I Քիյ |

ՔւՅյւ, իԹ, ցժՄյ, յմյ ֆւի Քււ,Պցի Քււ,Պ Կց Կււ(ԿւււՔ), ՄժմԿււՊ լւԵ մի շւլ յղկ՝
 Քրժի e՛նւի Կիւ ռղ| յղկ՝Քրժի Rb՝ մւււ eՉի շխժի շմբ իւււժ շւիժ ֆյյ ռղ| Շէ 8-
 9 ցւմ շմբ լւժի I Քիյ | ԿժԿ ԿՅւսկ ռՅ ԿժԿ ԳԿի ԱւԿիւի շխժի յղկ՝Քրժի Կիւ ծղղ|
 շխժի ի Մֆիւ Յւ 2-2.5 յղււի իւււժ ռէ| ԿՅԿիւժի Եր ցւՉ Չոուի ԿժԿ մԵւմ ԱւժՄ ՊիւՅԿի
 իւււԿիւԿո, ցւՉ I ԱւՄՉիւ շխժի ռՅ յղկ՝ Կիւժ ռէ| շՅ ԿՅւսժԿ 160 Մժց իւււժ յիւժ
 Յւ Կիւ ծղղ| Ա_Եր շՅ ԿՅւսժԿ ՅւՄ ժմւււ Ե Եւո (1-1.5 յղււի շմբ ի Մֆիւ Յւի Rb՝)
 e՛նւի Կիւժ ռէ| ԿիւԵրԿ Եժիւժի ԿիւՉ Գ Եւո շւլ զւ ծղղ| ժմւււ իժ յԵլ յւր 4-5
 յիւ լւժի | Գմց Մի յյ յի ԿիւՅ շխժի շմբ e՛նւի Կիւ ԺիՅ ծղղ|

ՔԵ I մւի ԳԿԿ Քրժի շիւրցի ցՅԵ e՛նւի Կիւժ ռէ| շւՄ 4.1 Գի յղկ՝ ԱԵրժի շխժի
 իււււ Չոտժ ռէ ԳԵս մւի յՄ-4 ԱԵրժի մաւի-Կ Լւ՝՝ շժիւՄ Կիւժ ռէ|

մւի յՄ 4 լ շՅ ԳԿի շՅ յիւ Լւ՝՝ շժիւՄ ի շի ցւՄ|

ցւմ	շՅ ԳԿի շՅ յիւ Լւ՝՝ (իԿիՅ)
1	2.0
2	2.5
3	3.0
4	4.0
5	5.0
6	6.0
7	7.0
8	8.0
9	9.0
10	10.0
11	11.0
12	12.0

Գ շիւՅ ԱԵրժի Կիւժ ռէ շՅ ԳԿի 50-70 ցւՄ ցւՉ Ժրւււ Յ ռէ| Գժիւժ ԳԿԿ Քրժի
 լի յիւ ԱԵրժի Կիւժ ռէ|



ԱԵրժի (Activity) լ աիլ, ԱւԵրժի ԳԿիւ շխժի ԱւՉ յիւ ԱւՅԵ 1 ինսի | Ի շխժի յիւժ
 ԳԿ ռժի ի Rb՝ ցւՉ Քրժի ի ժիւժ ԱւԵրժի շՅ յիւ Կ շի ցւժ յիւ մաւի-Կ Լւ՝՝ շժիւՄ Կիւժ ռէ
 յիւ յիւ Գի ԳԿիւ մւի յՄ շՅ Կիւժ|

մւի ցժ ռււո Եր շիւ յիւ e՛նւ Չիւ իւււ շիւ շիւ յիւ Կիւժ ռէ| շիւժի շմբ I շխժի շմբ
 Յիւ ցւժ յիւ Գժի իւււ Չոտժ ռէ| ԳԿ շժիւժի ցւժի Քրժի ԳԿԿ ԳԵս ԳԿիւԿ
 շժիւժի ցւժի Քրժի յղկ՝Քրժի Եյ յիւ յիւ յիւ ԳԿԿ Քրժի մնՅ I յիւ Քրժի | շՅ ԿՅւսժի
 շխժի իւււժ յիւ 60-65 յիւ իւււ յիւ մւի I մաւի-Կ Լւ՝՝ շժիւՄ Կիւժ ռէ| 3-6 ցւժի
 յիւ ցւժ Երժի յիւ ԱւԿիւ յիւ Կիւժ| յղկ՝Քրժի Rb՝ ԿիւՅյւ, իԹ, ցժՄյ, յմյ ֆւի
 Քււ,Պցի Քււ,Պ Կց Կււ(ԿւււՔ), ՄժմԿււՊ լւԵ մի շւլ յղկ՝ յիւժ Կիւժ ռէ| շՅ ԿՅւսժԿ Գմ
 շժիւժի 32 յիւ իւււ Չոտժ ռէ| Գժի ռժի Ժրւււ յիւ յիւ ԳԿի 50-70 ցւՄ|



cu#VvEi gj`iqb 4.2

mi#K DEti i cu#k i#K i#Pý (✓) i# b|

- 1| tcvbri cwi en#Yi me#P#tq `e#ÁmbK cš#i tK#b#U?
K) n#m#tZ tcvbri cwi enY
L) A#i# tRb Q#ov# c#ij #_b e`i#M tcvbri cwi enY
M) A#i# tRb h#j c#ij #_b e`i#M tcvbri cwi enY
N) c#m#tKi evj #Z#Z tcvbri cwi enY

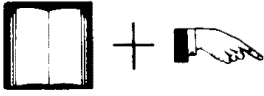
- 2| tcvbri Q#ov#i DEg mgq tK#b#U?
K) `#j
L) mK#j
M) #eK#j
N) i#Z

- 3| #gk#P#i tK#b#U?
K) GK c#R#m#Z#i P#i
L) GK#m#K c#R#m#Z#i P#i
M) i#v#R#m#i P#i
N) K#v#Z#j#v#g#t#Q#i P#i

- 4| c#Z kZ#v#t#k KZ tK#R P#e e`en#i K#v D#P#Z?
K) 0.5 tK#R
L) 1.0 tK#R
M) 1.5 tK#R
N) 2.0 tK#R

- 5| i#v#R#m#i c#k#i M#f#i#Z#v#KZ n#j# f#j#?
K) 2-3 #g#U#i
L) 1-1.2 #g#U#i
M) 3-4 #g#U#i
N) 4-4.5 #g#U#i

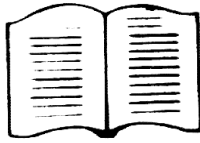
cW 4.3 LĒrq, tPŠer/Pvq Ges avb tġġZ gvQ Pvl, mġuŠZ gvQ Pvl



G cW tktl Avcib –

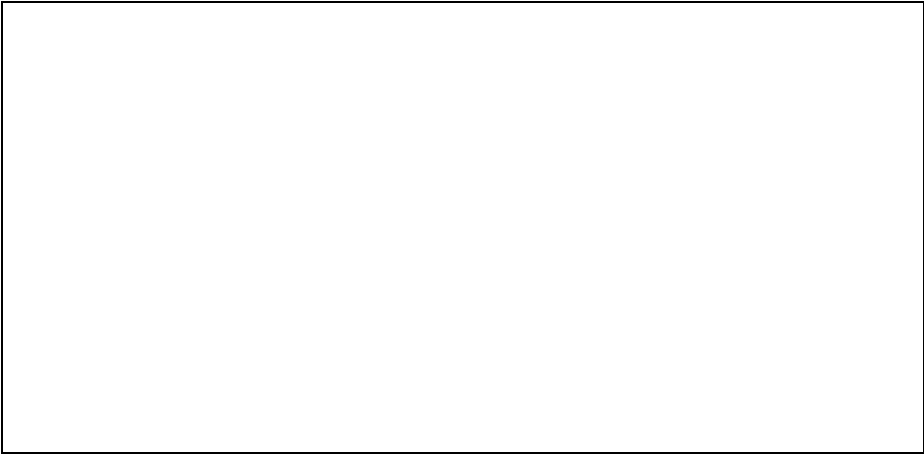
- LĒrq gvQ Pvl mġutK[®]eY[®] KiġZ cviġeb|
- tPŠer/Pvq gvQ Pvl mġutK[®]e^vL^v KiġZ cviġeb|
- avb tġġġ gvQ Pvl mġutK[®]eY[®] KiġZ cviġeb|
- mġuŠZ gvQ Pvl mġutK[®]Avġj vPbv KiġZ cviġeb|

LĒrq gvQ Pvl



eb^vi cmb, b^x, nvl o, Lij, vej, nⁱ BZ^v eo eo Rj i mktZ LĒrq gvQ Pvl Kġi ġvġQi Drcv^b evovġbv m[®]e| AvqZvKvi ev PžvKvi tKvb Kivġtġvi mev[®] K AveZ Kġi gvQ Pġli Rb^v LĒr^v Zvi Kiv nq| Zte LĒri Dci v[®]ġK ġvġQi Lv^v mieivn Kivi Rb^v e^viv ivLv nq| LĒr AveZ Kivi Rb^v m Zv ev Zvġi Rij, evki evLvi e^venvi Kiv hvq| LĒri Kivġtġvi Rb^v tj v^vi iW Gġj, evka, ev Kv^v e^venvi Kiv hvq| Zte tj v^vvB m[®]eġg| tj v^vi Kivġtġvi c[®]ġK LiP teik cġo| m[®]Š^vU[®]K AġbK v[®] b| Rij v^vt[®]te v^vmb[®]UK Rij metPġq fij | LĒri AvKvi 1 Nbvġvi Kiv DvPZ| ġ^vb tjvK G aiġbi LĒr thLvġb tmLvġb enb KiġZ cviġe | Rġj i dv^v Ggb eo nte hvZ gvQ teiġq thġZ bv cviġe |

tm[®]Znvb ev Kg tmġZi cvbġZ LĒr emvZ nte| teik tmġZ LĒri e^vvcbv Kw^v l e^vq^vva^v| LĒr Lv^v ev cvġdg[®]iv emvZ nte| Lv^v i tPġq cvġdg[®] teik fij (vPġ 30, 31)| tZġj i v^vg[®] iv cvġdg[®]Zvi Kiv hvq| cvġdg[®]e^venvi Kiġj th tKvb Mfvi Zvq LĒr emvġbv hvq|



vPġ 30 t Lv^v iv v^vmcZ LĒri m^vi



WPT 31 t cUdtg^omcZ LvBi mwi

LvBiq gvtQi Pvl ntjv ubneo Pvl | G PvlI Rb` Kwlg myg Lv` AZ`vek`K| Avgvt`i t`tk
ubneo Pvl | G PvlI Rb`
Kwlg myg Lv`
AZ`vek`K| Avgvt`i
t`tk LvBiq tZj mcqv,
gv, i I ivRcylI Pvl
mæ|

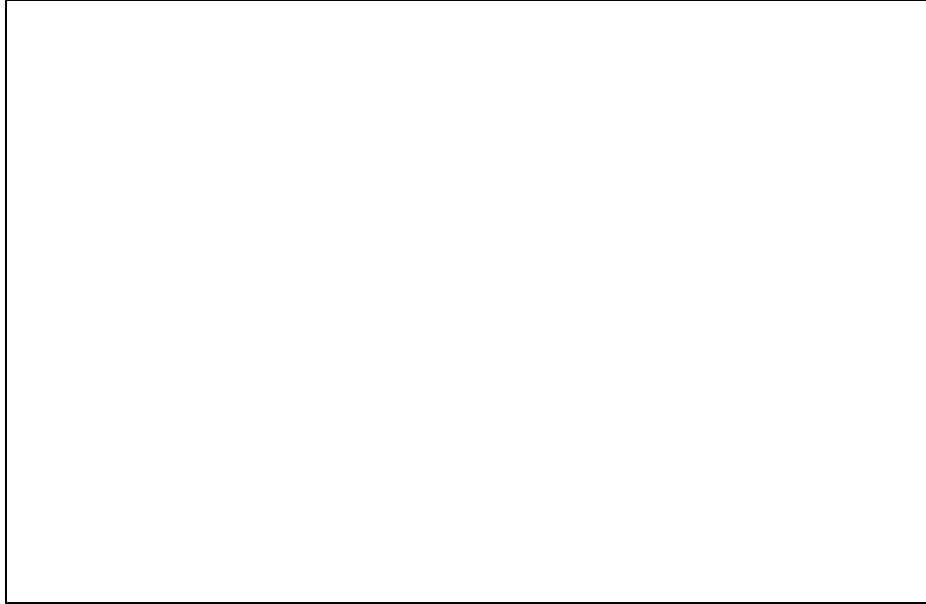
LvBiq gvtQi Pvl ntjv ubneo Pvl | G PvlI Rb` Kwlg myg Lv` AZ`vek`K| Avgvt`i t`tk
LvBiq tZj mcqv, gv, i I ivRcylI Pvl mæ| Zte Gt`i gvtS tZj mcqv Pvl jvfRbK|
tZj mcqv Pvl Ki tZ ntj cõZ 1 eMõUvi LvBiq 200-300W tcvbr QrotZ nte| Mtgi fwl I
wkwj h_vptg 85% I 15% niti wkwj gvtK Lv` wntmte w`tZ nte| cõZw`b Lv`i
cwi gY_vKte gvtQi t`tni IRtbi 6-7%| LvBi Zjvi meUKzAsk cij_w`b w`tq gytq
ZitZ Lv` w`tZ nte| A_ev iuk w`tq LvBiq UKwi Sij tã ZitZ Lv` mieivn Ki tZ nte|

wKQyb ci ci LvBi Ryj cij I tkljvq fWZ^ontq thtZ citi |Ggb ntj etk ev etk i
kji Sivr w`tq Ryj cwi^ovi Kti w`tZ nte| cõZ 3 gym Ašli Ašli GKU LvB nãZ 20
tKwR tZj mcqv Drcv`b Kiv mæ|

Avgvt`i t`tk tPšer`Pvq
AmclKvb I µm gv, i,
tZj mcqv I ivRcylI Pvl
mæ|

tPšer`Pvq gvQ Pvl

tPšer`Pvq gvQ Pvl GKU ubneo Pvl c×wZ | G t`qãI Kwlg I myg Lv` Acwivh^o gvQ
PvlI Rb` tPšer`Pvi Avkvi 50 eMõã nãZ KtãK nãRvi eMõã chšI nãZ citi | Avgvt`i
t`tk tPšer`Pvq AmclKvb I µm gv, i, tZj mcqv I ivRcylI Pvl mæ| Zivov tPšer`Pvq
gv, i, uks, e`vt0i tcvbr I e`vt0i Pvl mæ (WPT 32)|



ՊՏ 32 t ԻՏԵՐՊՐԳ ԳՎՈՒ ՔՐԻ

cՈՅ 0.2 eMՊՆԻ ԳԿՈՒ ԿՖԻ μ m ԳՎՆԻԻ ԽԵՐՆ ԽՈՒՐ-ԲՈՒ, ՍԵՅԷՆ ԵՆ ԿՐԳՏԿԻ ԳՎՄՏԻԿ ԼՐ՝՝ ՆՏՄՏԵ Ե՛ՆՆԻ ԿԻՅ 2 ԳՎՄ ԳԿՈՒ ԳՎՈՒ ԻՐԵ ՎՈՐԳ 200-250 ՄՊԳ/ ԻՏԵՐՊՐԳ ԸՆԽԻ ՄԲՈՒ ԶՆ ԻՎԼՅ ՆԻ 0.6-0.8 ՊԳՆԻ ԳԵՏ ԸՅ 15 ՆԵ ԸԻ ԸԻ ԸՆԽ Ե՛Յ ԿՖԻ ՆՅ ՆԳ |

ԻՏԵՐՊՐԳ ԽՅ ՆՈՐՎԻ ԽԿՆ ԸՐՆԻՅԻ ՔՐԻ ԿԻՅ ՆՅ ԸՅ eMՊՆԻ ԳԿՈՒ ԿՖԻ ԽԵՐՆ ԽՈՒՐ ԻՄԳԻ ԲՈՒ Ի ՆԿՐԳՅԻ ՊԳԿՅ (80%-20%) ԼՐ՝՝ ՆՏՄՏԵ Ե՛ՆՆԻ ԿԻՅ ՆԳ | ԳՅ 3 ԳՎՄ ԳԿՈՒ ԳՎՈՒ ԻՐԵ ՆԳ 60-70 ՄՊԳ/ ԻՏԵՐՊՐԳ ԸՆԽԻ ՄԲՈՒ ԶՆ ԻՎԼՅ ՆԻ 0.6-0.8 ՊԳ. ԳԵՏ ԸՅ ՄԵՐՆ ԳԿԵՐԻ ԸՆԽ Ե՛Յ ԿՖԻ ՆՅ ՆԳ |

ԻՏԵՐՊՐԳ ԸՅ ՊԳԿ Ե՛ՎԳ 15 ԽՆ.ՊԳ. ԸՆԽ ԽՈՒՐ ԶՆՅՅ ՆԿՏ Ի ԳՎՆԻԻ ԽԵՐՆ ԽՈՒՐ ԽԵՐՆԻ ՔՐԻ ՆՈՐՎԻ ԸՅ eMՊՆԻ 5ՈՒ ԿՖԻ ԳՎՆԻԻ ԽԵՐՆ ՈՐՈՐ ԻՐԳ | ԱԲ՝՝ ՆՅԿ ՆԿՏ ԳԻ ԽԵՐՆ ՈՐՈՐ ԻՐԳ 200ՈՒ | 15 ՆԵ ԸԻ ԸՆԽԻ ՄԲՈՒ ԶՆ 0.3 ՊԳՆԻ ԵՐՈՎՅ ՆԳ | ԼՐ՝՝ ՆՏՄՏԵ ԸՅ ՊԳԿ Ե՛ՎԳ ՆՈՐՎԵԴՆ. (tubifex) ԳԵՏ ԸԻ ՆՈՒԿՆ ԳՎՈՒ ԽԸԻԻ Ե՛ՆՆԻ ԿԻՎ ԻՐԳ |

ԻՏԵՐՊՐԳ ԸՅ ՊԳԿ
Ե՛ՎԳ 6 ԲՈՒ ԸՆԽ ԽՈՒՐ
ԶՆՅՅ ՆԿՏ Ի ԳՎՆԻԻ ԽԵՐՆ
ԽՈՒՐ ԽԵՐՆԻ ՔՐԻ ՆՈՐՎԻ
ԸՅ eMՊՆԻ 5ՈՒ ԿՖԻ
ԳՎՆԻԻ ԽԵՐՆ ՈՐՈՐ ԻՐԳ |

ՆԿՏ, ԳՎՆԻ, ԿԲ, ԸՅ,
ԽՈՒՐ, ԽՅ ՆՈՐՎԻ, ՎԲ
ԻՎՐԸ, ՊԳԻ ԿՎԸ,
ԿՆԸՔ, ՆՆԿ, ԽԸՎ ԲՅ՝՝
ԳՎՈՒ Ե՛ՎԳ ԽՅ ՊԳԿ ԿԻՎ
ԻՐԳ |

Ե՛Վ ԽՅՅ ԳՎՈՒ ՔՐԻ
Ե՛Վ ԽՅՅ ԳՎՈՒ ՔՐԻ ԸՆՆԻ ԸՅ 100 ԵՈՒԻ ԸՅՆԻՎ | Ե՛Վ ԽՅՅ ԳՎՈՒ ՔՐԻԻ ԽՅՅՅ Ե՛Վ ԳՅ՝՝
ԸՅ ԱՎԻ ԳՎՈՒ ԽՅՅ ըՅ | ԽՆԵ ՆՈՐՎԻՅՅ ԸՆԽ ԱՎՈՒԿ ՎՅԿ ԽՆԵ ՐՆԳ Գ ԱԻՅԻ ՔՐԻԻ
ՐԵ՝՝ ԸՅԳ | Ե՛Վ ԽՅՅ ԳՎՈՒ ՔՐԻԻ ՊԳՅ ՆՅՎ ԵԻՅԿ | ՆԿՏ, ԳՎՆԻ, ԿԲ, ԸՅ, ԽՈՒՐ, ԽՅ ՆՈՐՎԻ,
ՎԲ ՆԻ ԸՅ, ՊԳԻ ԿՎԸ, ԿՆԸՔ, ՆՆԿ, ԽԸՎ ԲՅ՝՝ ԳՎՈՒ Ե՛ՎԳ Ե՛Վ ԽՅՅ ԳՎՈՒ ԿԻՎ ԻՐԳ |

c0tg avb t9tzi AvBj Dpzkti tetā mbtZ nq| Gici t9tzi Pviw`k 0.3N0.6 ugUvi
c0`l 0.3N0.5 ug. Mfxi Kti bji v tktU mbtZ nq| A_ev t9tzi gvtS GKU tQvU MZ
Kti Zv t9tzi Pvi c0tšlPmiuU ev Zvi tPtq Awak bji v tktU AvBtj i Kiv chšlAvbtZ nte
(wP 33)|



wP 33 t avb t9tzi gvtQi Pvi

GKvR_tjv m`ubekivi ci h_vimZ t9tzi Pvi w`tq avb jvMtZ nte| hLb avtbi Pvi_tjv
gviUvi mt_ k³ fite tjtm hite ZLb c0Z tn±ti 2500-3000 uU tcvbv QvotZ nte| tcvbv
GKU ev GKwaK cRwzi nZ cvti | avb t9tzi h_vmae tenk Mfxi Zvq cwb ivLtz nte|
elā iitZ tcvbv QvotZ nte Ges aitZ nte avb Kivvi mgq| GtZ Drcv`b `vante
200-250 tKwR/tn±i |

gvQ, ci, cvL, km` I
dj gj- hLb GKtI GKB
Lvgvi e`e`vcbvi Aaxtb
Pvi Kiv nq ZLb ZvtK
mgvSZ gvQ Pvi
(Integrated Fish
Culture) ejv nq|

mgvSZ gvQ Pvi

gvQ, ci, cvL, km` I dj gj- hLb GKtI GKB Lvgvi e`e`vcbvi Aaxtb Pvi Kiv nq ZLb
ZvtK mgvSZ gvQ Pvi (Integrated Fish Culture) ejv nq| Lvgvti i etR⁹ m0`envi Kti
Kg Li tP Drcv`b evotbv G cxwzi c0vb Dti tk`| Zte Gi mt_ Rwg, klgK Ges gj-atbi
m0`envi I h⁹ nZ cvti | gvQ I gjvMi Pvi GKU mgvSZ Pvi cxwz| G t9tI gvQ, gjvM
I dj gj i Pvi GKtIxfZ Kiv nq|

gvQ I gjvMi mgvSZ Pvi

gvQ Pti i Rb` h_vimZ cktz `Zvi Kiv nq| Gici cktzi Dcti ev cto gjvMi Ni `Zvi
Kiv nq Ges cktzi cvto dj ev kvK-meRxi MvQ jvMtbv nq| gjvMi me0v cktzi mvi
wtmte e`eüZ nq Ges cktzi DeP gvU dj gj- I kvK-meRxi MtQi tMvovq e`eüZ nq|
Averi dj gj i eR⁹gjvMi Lv` Ges cktzi mvi wtmte e`eüZ nZ cvti |

gvQ I me0v cktzi mvi
wtmte e`eüZ nq|

Kvl.1 cj# Dbqpb ˘z

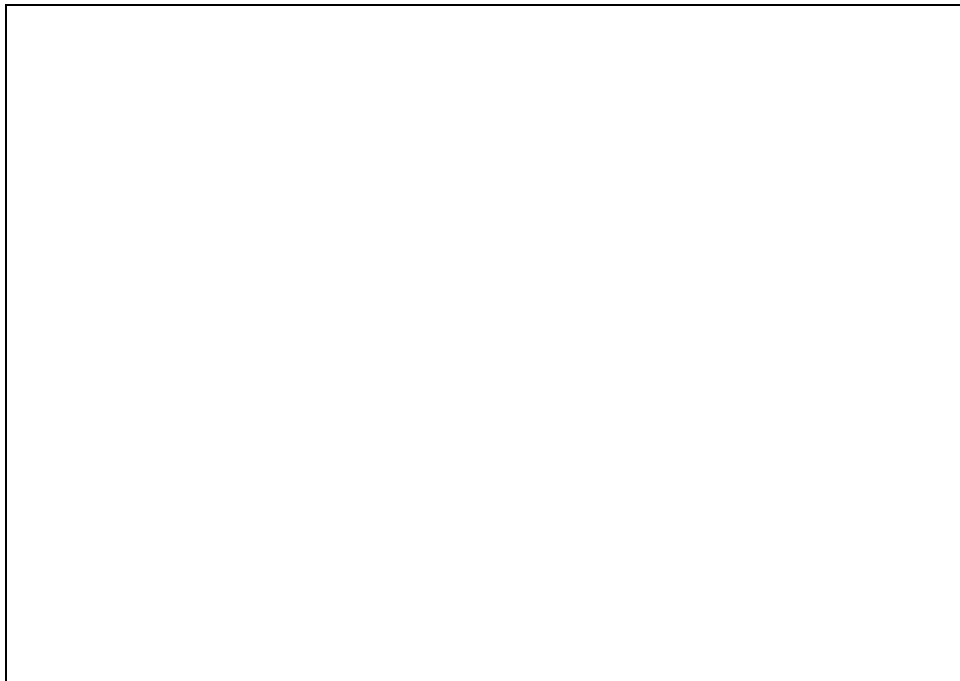
mgk^a Pvl ev GKK Pvl i Rb^ˆ thfite cƒz cŒZ Kiv nq, GtƒtŒI tZgbfite cŒZ KitZ nte| Gici cŒZ weNvq mvi wY-5 Abyvti wefbaœRvzi tci bv QvoŒZ nte|

mvi wY 5 t mgwŒZ gvQ Pvl i tƒtŒI tn±i cŒZ wefbaœRvzi gvŒi msl˘v|

gvŒi bvg	msL˘v / tn±i
KvZjv	600
wj fvi Kvc	1800
iB	1500
gŒMj	1200
MŒm Kvc [€]	600
wgi i Kvc ^Œ Kvc ^Œ	300
tgvU	6000

gvŒi Ni ˘Zwi Kivi mgq wŒPi wbgg AbyvY KitZ nte

gvŒi Ni cƒzi Dci ev cvto ˘Zwi Kiv thŒZ cŒti | Zte cƒzi DcŒi Kitj Ni cwi[®]vi Kiv mnR nq| cŒZwU etjvi gvŒi Rb^ˆ 0.09-0.14 e.wg. ˘Œbi cŒqvRb nq| Ab˘wŒK wWgcvor gvŒi Rb^ˆ cŒqvRb nq 0.2-3 e.wg. | evk I KvW˘Œq gvŒi Ni ˘Zwi Kiv hvq| evŒki evZv (evLwii) wŒŒq gvŒi NŒii tgŒS ˘Zwi Kiv hvq| evZvi gvŒS dŒk ivLŒZ nte 1 tm.wg. Gi gZ| GŒZ KŒi dŒk wŒŒq gvŒi cv XŒK hvŒe bv| tgŒS nŒZ NŒii Pjvi D˘PZv nte 1-1.5 wglvŒi i gZ| NŒii Pwi wŒŒK teov wŒŒq gvŒS dŒk ivLŒZ nte evZvm PjvPŒj i Rb^ˆ| wŒqvj I ebweotj i AvµgY nŒZ mvearb ˘vKŒZ nte| PŒŒj i QvDwb Qb, bvor ev KvŒeb Œvii t˘ I qv thŒZ cŒti (wPŒ 34)|



wPŒ 34 t cƒzi i Dci gvŒi Ni

cĀZ tn±i cĀzi 460-500u gjm i vLvi e`e`v Kiv hvq| G msL`vq cĀzi i cmb bó nq br| cij tbi Rb` 1 gym eqtmi ev`Pr ubaŕY KižZ nte| etjvi gjmI Prl Kitj mviwY-6 Ablyvq Lv` mieivn KižZ nte|

mviwY 6 t etjvi gjmI Rb` newfbæqtm Lv` mieivtni cui gvY|

DcKiY	mgq I cui gvY (tKwR)	
	0-4 mBun	5-8 mBun
Mg fvOv	50	50
wgwn Kgv	14.5	17
wZtj i %j	16.0	15
wkngj	19.0	16
wSbtKi ,av	--	1.5
jeY	0.5	0.5
tgvU	100 tKwR	100 tKwR



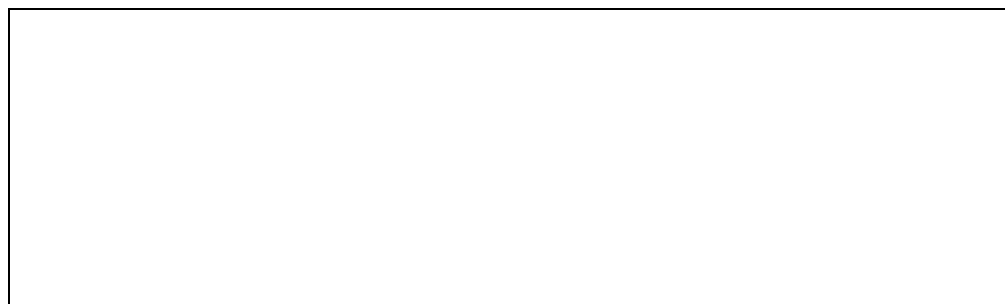
Ablyv b (Activity) t aily, Avcbvi GKwU cĀz AvtQ hvi AvqZb 0.5 tn±i | H cĀzi Avcub gvQ I gjmI mgwSZ Prl Kivi K_v fvefQb| tmtŕŕŕ Avcub tKvb&tKvb&cŕwzi gvQ KZwU Ovoteb Ges KZwU gjmI cij b Kižeb Zv hvP mnKvti wj Lj|

Ab`w tK wlg t`qv gjmI jvj b Kiž mviwY-7 Ablyvni Lv` mieivn KižZ nte|

mviwY 7 t wlg t`qv gjmI jvj tbi tŕŕŕ newfbæqtm Lv` mieivtni cui gvY|

DcKiY	mgq I cui gvY (tKwR)		
	0-4 mBun	5-16 mBun	16 mBvtni Dcti
Mg fvOv	46.0	46.0	44.0
wgwn Kgv	20.5	24.5	29.0
wZtj i %j	16.0	14.0	12.0
wkngj	17.0	15.0	10.0
wSbtKi ,av	--	--	4.5
jeY	0.5	0.5	0.5
tgvU	100	100	100

Lvevi ctŕŕ Lv` Ges cmbi ctŕŕ cmb mieivn KižZ nte (wPŕ-35)|

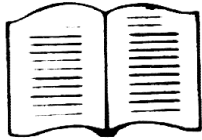


wPŕ 35 t gjmI Lvevi I cmbi ctŕŕ

Kul. I cj. Dbqb ˘z

Lvt`i cvt`i gvc nte : `N°1 ugUvi, cõ' 0.2 ugUvi Ges DŽPZv 0.1 ugUvi | G ai`bi GKU Livi cvt` 24 uL gjmMi Rb` ht`ó/ mrvuK ev uL`bi _vjvq gjmMi Rb` cmb mieivn Kiv thtZ cvt`i |

ivYt`ŋZ, emšf Ktj iv BZ`w` tivtMi Rb` mgq mgq uUKv w` tZ nte | G cxwZtZ tKvb mri e`envi bv Kti eQti weNv cõZ tn±ti 4600-5400 tKwR gvQ Drcv`b Kiv thtZ cvt`i | Ab`w`fK etjvi gjmMi Drcv`b `vavte 5400-5800 tKwR | wLg t`qv gjmMi tŋt` eQti 64-78% gjmM wLg w` t`q _vtK |



mvi gg Lvbq gvQ i Pvl ubneo Pvl cxwZ | eo eo Rj vktq Lvbq gvQ i Pvl mæ | t j vrv l etk mn wefbaai`bi DcKiY w` t`q Lvbvi KvVtgv `Zwi Kiv hvq | mžv ev Zvt`i Rvj Lvbq e`envi Kiv hvq | tPšer`Pvq gv, i, tZjwcvq, ivRc`mi ubneo Pvl mæ | tPšer`Pvq wks, gv, ti tcvb Drcv`b mæ | avb tŋtZ gvQ i Pvl cxwZtZ avb gL` dmj Ges gvQ tMŠY dmj | avb tŋtZ wks, gv, i, KB, c`d, tUsiv, tZjwcvq, _vB mic`d, wgi i Kiv, KmcP BZ`w` gvQ Pvl Kiv mæ | gvQ i gjmMi Pvl mgwšZ gvQ Pvl | gvQ i gjmMi GKt` Pvl gjmMi Ni ckt`i cvto ev ckt`i Dcti `Zwi Kiv DvPZ | gjmMi weov gvQ i mvi wntmte e`eüZ nq |



cuVvEi gj`iqb 4.3

mWk DEti i cuK Wk iPy (✓) i b|

- 1| LvPiq gvtQi Pvl tKvb&aitbi Pvl c×wZ?
 K) Avav ubweo
 L) ubweo
 M) AvZ ubweo
 N) mbvZb

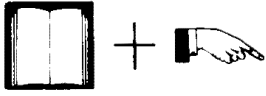
- 2| tPŠevPiq tKvb&tKvb&cRmZi gvQ Pvl mæe?
 K) iB, KvZjv, gMj
 L) UmK, tkvj, MRvi
 M) gv, i, tZj wcvq, i vRcjd
 N) cisMm, wPZj, KwicP

- 3| avb t¶tZ cWZ tn±ti KZwU tcvbv QvoŧZ nte?
 K) 2000-3000 wU
 L) 2500-3000 wU
 M) 2500-3500 wU
 N) 3000-3500 wU

- 4| gjwMi weov gvtQi cKzi Kx wntmte e`eüZ nq?
 K) Lv` wntmte
 L) mvi wntmte
 M) Lv` I mvi wntmte
 N) tKvb wKQb bv

- 5| mgwšZ gvQ Pvl eQti cWZ tn±ti gvtQi Drcv`b KZ ntZ cvti?
 K) 5000-6000 tKwR
 L) 4600-5400 tKwR
 M) 7000-8000 tKwR
 N) 8000-9000 tKwR

cW 4.4 gŕ Rj vkq e ĩc b v

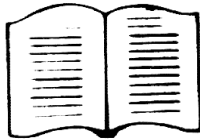


G cW tkłI Avcib –

- gŕ Rj vkqmgŕni e ĩc b vi c x i Z , t j v e Y b r K i t Z c v i t e b |
- gŕ Rj vkłqi c m i g v Y I Z v i D r c v ĩ b m ĩ t Ű A v t j v P b v K i t Z c v i t e b |

gŕ Rj vkq

eb ĩvi c m b , b ĩ x , L i j , ű e j , n v l o , e v l o , n ĩ , t g v n b v A Ā j B Z ĩ w ĩ n t j v g ŕ R j v k q | t h m e R j v k ł q i c m b i ű b q ŝ ŕ m ĩ u ĩ P ĩ c c k u z i I c i ű b f P k i j G e s c m b ű b q ŝ ŕ Y g v b ŝ i K i Y x q L ŕ t e w k ű K Q y v t K b v t m , t j v B g ŕ R j v k q | K v B v B n ĩ g v b ŝ i m i o n t j I G i ű e k i j Z v i R b ĩ G u U g ŕ R j v k q | e v s j v t ĩ k c ł q 4 0 j ŕ t n ĩ c m i g v Y g ŕ R j v k q A v t Q | e v s j v t ĩ k i g r m ĩ D r c v ĩ t b i c ł q 7 0 % A v t m g ŕ R j v k q n t Z | e v s j v t ĩ k g ŕ R j v k ł q i R j v q Z t b i c m i g v Y m v i ű Y - 8 G c ł Ę n t j v |



eb ĩvi c m b , b ĩ x , L i j , ű e j , n v l o , e v l o , n ĩ , t g v n b v A Ā j B Z ĩ w ĩ n t j v g ŕ R j v k q |

m v i ű Y 8 t e v s j v t ĩ k g ŕ R j v k ł q i R j v q Z t b i c m i g v Y |

e v s j v t ĩ k i g r m ĩ D r c v ĩ t b i c ł q 7 0 % A v t m g ŕ R j v k q n t Z |

Rj vkłqi big	Rj vqZb (tn ĩ i)
b ĩ x , L i j , L v o I t g v n b v A Ā j	10,31,563
n v l o I ű e j	114,163
e v l o	5,488
K B v B n ĩ	68,800
c v e b f i q (ű b g ű ĩ Z k m ĩ f i g m n)	28,34,008
m e f g v U	40,54,022

D c t i v ³ ű e k v j R j i v k i g r m ĩ D r c v ĩ b g ű ĩ 5,60,000-6,00,000 U b | G Z K g D r c v ĩ b n l q v i K v i Y ű b ĩ c t

- a v b P v l , t f i w o e r a , t m P I i v ĩ N v U ű b g P Y K t i g ŕ R j v k q b o K i Y |
- g v t Q i e s k e x i n v t i i t P t q t e w k n v t i g v Q A v n i Y |
- ű b i e P t i c R b b K v i x g v Q I t c i b v ű b a b |
- K u l . I ű g j c ł Z o v t b i ĩ Y |
- m i K v i b m Z g v j v I c m i K i b v i A f i e |

a v b P r t l i R b ĩ A t b K L v j - ű e j , b ĩ x - b v j v , n v l o , e v l o B Z ĩ w ĩ R j v k q , t j v i v k t q t d t j a v b P r t l i D c t h v M x K i v n t ĩ Q | A v e v i A t b K R j v k q n t Z a v b t ŕ t Z t m t P i R b ĩ c m b t b q v n t ĩ Q | A v e v i a v b t ŕ t Z i t c v K v ĩ g b K i v i R b ĩ K i U b i k K e ĩ n v i K i v n t ĩ Q | G m e K v i t Y R j v k q , t j v g v t Q i e m ĩ v t b i A b j c v t h v M x n t q h v t ĩ Q |

A t b K ĩ t b t f i w o e r a t e t a e b ĩ ű b q ŝ ŕ K i v n t ĩ Q | G m e t f i w o e r a i K v i t Y g v Q b ĩ x n t Z P r i Y f i g t Z c ł e k K i t Z c v i t b v | Z v O v o r t f i w o e r a A t b K c R b b f i g b o K t i ĩ t ĩ Q | d t j g v t Q i D r c v ĩ b K t g h v t ĩ Q |

Kul.1 cji Dbqbb`z

gʒ Rj vktqi Pvl thvM` AAj , tj vtZ mwfbcxwZtZ gvQ Pvl Kijt gvtQi Drcv`b evotbv mæ| KviY hLb gvQ Pvl Kiv nq ZLb Drcv`tbi melq , tjv mbqštY ivLv nq Ges Drcv`btK mbwDZ Kiv nq|

ctivŋ e`vcvvi AwKvskB RvZiq bmvZgvjvi Ask metkl | G , tjv h_vh_ fite cvj b Kijt gvtQi Drcv`b evotbv tctZ cvti |

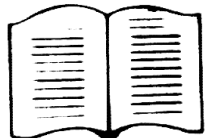
gʒ Rj vktq tcvb Ovovi Rb` h`ó cRbbKvix gvQ iŋv Kiv`iKvi | Gi Rb` nvl o l b`x , tjvtZ KZ , tjv Mfvi AAjtK iŋv KijtZ cvitj AtbK cRbbKvix gvQ iŋv tctZ cvti | Gi Rb` wKQynvl otK wj Rgʒ ivLtZ nte| Zivov eo eo b`xi wKQyAAjtK mivi eQi gvQ aiv t`tK meiZ ivLtZ nte| miKwii chŋq Gaitbi e`v MhtYi tPov Pj tQ|

Ab`w tK me , tjv nvl to GK mgtq gvQ aivi c`wZ e`j Kti cZw nvl to 7-10 eQi Ašŋ chŋqutg gvQ aivi e`v KijtZ nte| GtZ Kti cZ eQi nvl to wKQycRbbKvix gvQ t`tK hvte| Gme gvQ elŋ Avit`cnvl o t`tK tei ntq cRbb AAjt wWg w`te|

evsj vt`tki grm` msi ŋY AvBb , tjv hv` h_vh_ fite cŋqM Kiv nq Zv ntj AtbK tcvb Ges cRbbKvix gvQ iŋv Kiv mæ| wKŠ` t`Li melq nt`Q, grm` Aw` Bti i mvt_ cvj k evmbxi mgšqnbZvi KviŋY grm` msi ŋY AvBtbi mŋzcŋqM mæ nt`Q bv| Ab`w tK RbMYtK tcvb gvQ l cRbbKvix gvQ aivi Kzj m`tÜ mtPZb KijtZ nte| Gi Rb` tiwvl , tUw wfkcb, gvBK, wj dtj U BZ`w` e`envi Kiv thtZ cvti |

th tKub tŋtŋ mŋycwii Kí bv l bmvZgvjvi meKí tbB| evsj vt`tki grm` mæut`i Dbqbtbi Rb` Avil ev`eglx KgmŋP mbtq tm , tjvi ev`evqbtbi c`ŋc MhY KijtZ nte| eZŋvb AeKivrtgv e`envi Kti Lg` z` f` tgqv`x KgmŋP MhY KijtZ nte| Z`gwi fivel`tzi Dbqbb KgmŋP mgatK Gi Rb` 5 mijv ev 10 mijv cwii Kí bv MhY KijtZ nte| Gme e`v MhY Kijt gʒ Rj vktq gvtQi Drcv`b evotZ cvti |

mŋzcwii Kí bv l bmvZgvj v cŋqb Kti Ges grm` msi ŋY AvBb h_vh_ fite cŋqM Kti gʒ Rj vktq gvtQi Drcv`b evotbv mæ|



mvi gg^{ot} eb`vi cwib, b`x, Luj, wej, nvl o, evl o, nè, tgvnvr AAj BZ`w` ntjv gʒ Rj vktq| KivBvB nè gvbtj i mŋ ntj l mekvj Zvi KviŋY GwU gʒ Rj vktq| evsj vt`tki cŋq 40 j ŋ tn±i gʒ Rj vktq AvtQ| evsj vt`tki grm` Drcv`tbi cŋq 70% Avtm gʒ Rj vktq ntZ| gʒ Rj vktq gvtQi Drcv`tbi cwii gvY eQtí 5.6-6.0 j ŋ Ub| avb Pvl, tŋoeta, tmP l iv`lNvU mbgŋY Kti, AwZwi³ gvQ atí, mbwKviti cRbbKvix gvQ l tcvb tgti bvbv ai tbi `wZ` è` w`tq gvtQi Drcv`tbi nvm Kiv nt`Q | tcvb tQto, cRbbKvix gvQ l tcvb iŋv Kti Ges Pvl i e`v Kti gvtQi Drcv`b evotbv mæ| mŋzcwii Kí bv l bmvZgvj v cŋqb Kti Ges grm` msi ŋY AvBb h_vh_ fite cŋqM Kti gʒ Rj vktq gvtQi Drcv`b evotbv mæ|



cuVvEi gj`iqb 4.4

mWk DEti i cuK Wk iPy (✓) i b|

- 1| gŷ Rj vkq tKvb& tj v?
K) cKž, iPsiwi Lvgvi
L) thme Rj vktqi cmbi ubqšŷ m=úYpfc cKwzi Dci ubfPkj
M) thme Rj vkq kxZKvtj i iKtq hvq
N) thme Rj vkq Awak Mfixi

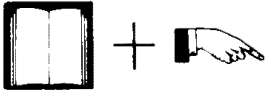
- 2| ersj vt`tki grm` Drcv`tbi cŕq KZ fM gŷ Rj vkq ntZ Avtm?
K) 50%
L) 60%
M) 70%
N) 80%

- 3| KvbvB nt`i AvqZb KZ?
K) 40,700 tn±i
L) 56,600 tn±i
M) 65,500 tn±i
N) 68,800 tn±i

- 4| gŷ Rj vktq gvtQi Drcv`b Kgvi Kvi Y tKvbW?
K) Lŷ tenk eb`vi dtj
L) kxZKvtj cmb Kg_vtK etj
M) ubiePti cRbbKvix gvQ I tcvbr ubatbi Kvi tY
N) divr`v evtai Kvi tY

- 5| ersj vt`tk gŷ Rj vktqi cwi gvY KZ?
K) cŕq 30 j ¶| tn±i
L) cŕq 40 j ¶| tn±i
M) cŕq 55 j ¶| tn±i
N) cŕq 35.5 j ¶| tn±i

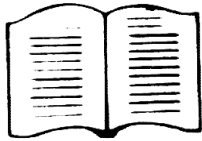
cW 4.5 A'vKni qvfg gvQ cvj b c×vZ



G cW tkłI Avci b –

- A'vKni qvg Kx Zv RvbtZ cvi teb|
- A'vKni qvfg gvQ cvj b c×vZ eYŃv Ki tZ cvi teb|

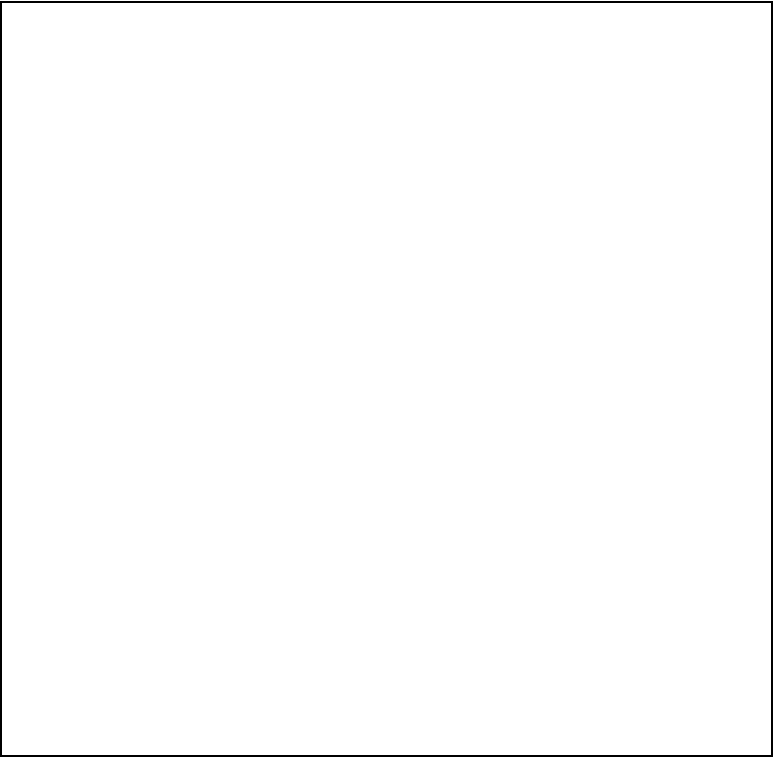
A'vKni qvfg gvQ cvj b



Pniw ĩK KvP Ńviv AveZ cwb avi Y ŃlgZv m×ubetKvb cvĪ thLvfb Dv"m I gvQ ivLv m×e ZvĩK A'vKni qvg (Aquarium) ejv nq| B"Qv Ki tĩ A'vKni qvfgi Zj vtZi KvP e'envi Kiv Pĩj | cwb tZ Aew"Z gvQ I Dv"m ĩK hvZ emni t_ĩK t`Lv hvq tmRb" A'vKni qvfg KvP e'envi Kiv nq| A'vKni qvfg gvQ cvj b GKvU tmšLb e'vcvi | Zte eZŃvfb Gi fij emYvR"K , iŃj AvtQ|

Pniw ĩK KvP Ńviv AveZ
Rj avi Y ŃlgZv m×ubet
ĩKvb cvĪ thLvfb Dv"m I
gvQ ivLv m×e ZvĩK
A'vKni qvg ejv nq|

A'vKni qvg bvbv AvKvZi nĩZ cvti | Zte AvvKvsk tŃĩĩB AvqZvKvi A'vKni qvg e'envi Kiv nq| A'vKni qvfgi AvKvi, tKv_vq emvfbv nte Zvi mĩ_ mvgÄm" ti tL vK Kiv nq| tm Kvi tY KĩqK eMŃĩ nĩZ ĩiyKĩ KĩqKkZ eMŃĩJi AvKvĩi A'vKni qvg nĩZ cvti |



vPĪ 36 t A'vKni qvfg gvQ cvj b

A'vKni qvfgi KvP hZ "Q nte ZZB fij | cwb i Pĩci Dci vfiĒ Kĩi KvPi cji v'v bavi Y Ki tZ nq| A'vKni qvg Ggb ĩvfb emvZ nte hvZ mĩRB tPĩL cto| tmRb" A'vKni qvg emvevi ĩvbi mĩ_ D"PZvĩ , iŃcYŃ A'vKni qvg 0.6-1.2 vglvi D"PZvq emvfbvB DĒg| Ziv A'vKni qvg emvevi Rb" GKvU ÷"vŪ cŃqvRb| A'vKni qvfgi ÷"vŪ GKvU tUvej nĩZ ĩiy

Kti bivr Kvi kvh`guUZ mKQyntZ cvti | melquU e`w3MZ iypI lci wbfPkij | A`vKwi qvg Ggb `vtb emvZ nte thLvtb mi vmi mthP Avtjv coe br | A`vKwi qvtg mi vmi mthP Avtjv cotj Lg ZvovZmo tkl jv RtbG Ges dtj cwb meR etYP ntq tms` h`nmb NUvq |

A`vKwi qvtgi emvevi `vb Ges = `vU wbanf Z nl qvq ci A`vKwi qvg cwi`vi Kti emvZ nte | A`vKwi qvtg cwb t`l qvi AvtMB Dw`c j vMvevi Rb` Zjv cU`Z Kti wbtZ nte | Gi Rb` tgvUv ewj , K`P K`P cv_i l iuOb `e`w` e`envi Kiv thtZ cvti | Zte gtb ivLtZ nte tKvb mtgB Ggb `e` e`envi Kiv hvte br th `tjv ctP | GtZ cwb bo nte Ges gvQ giv hvte |

Zjv cU`Z Kiv tkl ntj ZjwU cO`gZ mrvvtbvi ckeAvtm | GuU e`w3MZ cQt`i melq | Gici cO`gZ Dw`c emvZ nte | A`vKwi qvtgi Rb` bivr cRvzi Dw`c AvtQ tm `tjv cO`gZ e`envi Kiv thtZ cvti | j`q` ivLtZ nte tKvb iKtgB thb AZ`maK Dw`c br jvMvbtv nq | GtZ Kti A`vKwi qvtgi tms` h`nmb NUte | tFij mtbvi qv, tmi vtUvcbj vg BZ`w` Dw`c A`vKwi qvtg e`envi Kiv hvq |

Gi ci gaj wenxb cwi`vi cwb w`tq A`vKwi qvg fuz`Kiz nte | GKvR tUtci ev bj Ktci cwb e`envi Kiv DEg | A`vKwi qvtg cwb Ggbvte Xij tZ nte hvZ Zjv Ges Dw`c wKfite `vtK | cwb D`PZv A`vKwi qvtgi Dcti i tdtgi tMvov chS`l ivLtZ nte | hvZ Kti cwb Dcvi fVM evni ntZ tPvtL br cto | tPvtL br covi KivRw bivr vteB Kiv thtZ cvti |

cwb w`tq A`vKwi qvg fuz`Kivi ci gvQ QvotZ nte | A`vKwi qvtgi AvKviti mvt_ mvgAm` ti tL gvtQi AvKvi wbanf Y Kitz nte | A`vKwi qvtg Lg tenk msL`vq gvQ Qvotj tms` thP nmb NtU | GuU wAvtbi melq bq wktfi melq | evsj vt`k t`kx w`t`kx bivr cRvzi gvQ cvl qv hvq th `tjv A`vKwi qvtgi e`envi Kiv nq | thme gvtQi tPvL eo D`3aj cvLbv eo l evnmi Ges cwb ga``ti Nymdiv Kti tm me gvQB A`vKwi qvtgi Rb` DrKa. | thgb- tMvi wdk, tRei wdk BZ`w` |

A`vKwi qvtg Lg tenk msL`vq gvQ Qvotj tms` thP nmb NtU |

A`vKwi qvtgi e`e`tcbr

A`vKwi qvtgi KtP cwi`vi ivLvi w`tK bRi ivLtZ nte | KtP Acwi`vi ntj `uA` ev Kvco w`tq cwi`vi Kiv hvq | cwb Acwi`vi ntj Zv e`j Kti bZb cwb w`tZ nte | A`vKwi qvtg wdevi e`envi Kij cwb l KivP `wN`b cwi`vi `vtK | A`vKwi qvtg hvZ gajv br XtK tmRb` GKwU XvKv w`tZ nte | XvKv bivr ai tYi ntZ cvti |

A`vKwi qvtg wdevi e`envi Kij cwb l KivP `wN`b cwi`vi `vtK |

hw` A`vKwi qvtg cUkwZK Avtjv br cto Zv ntj `e`yZK Avtjvi e`e`v Kiv thtZ cvti | evtjji lqvU wbanf tYi Rb` cwb mtePP 6 BwA` Dcti evj | emvZ nte Ges w`tb 10 NEv Rjv vtZ nte | Rvbjvi cvtk ev evi v`vq A`vKwi qvg emvZ FZjy cwi eZ`bi KvitY Avtjvi ZieZv nrm tctZ cvti | Gi Rb` A`vKwi qvtgi Ae`vtbi wKQly cwi eZ`bi Kivi cUqvRb ntZ cvti | A`vKwi qvtg Lg tenk mgq Avtjvi Dciv`wZ Kvg` bq | Kvi Y GtZ Dw`c Lg tenk niti evto Ges A`vKwi qvg Dw`c` fuz`ntq thtZ cvti | Gme ntj gvtS gvtS Dw`c tKtU w`tZ nte | cwb wbtP Dw`c Kuvvi K`P cvl qv hvq | GKvR K`P e`envi Kiv thtZ cvti | ZvQvov Avtjvi Dciv`wZi mgqKvj l Kvgtq t`l qvi e`e`v Kitz nte |

cwb ZvcgvT`v gvtQi cRvzi mvt_ m`uKv` | cwb ZvcgvT`v 28-30` tmj wqvm ivLv cUqvRb | kvZKvtj cwb ZvcgvT`v hLb AtbK Ktg hvq ZLb WzS`l wUvi e`envi Kti cwb Kiv`qZ ZvcgvT`v eRvq ivLv m`e | A`vKwi qvtg evZvimi c`v`n t`l qv cUqvRb | ZvtZ Kti

A`vKwi qvtgi gvtQi Rb` wUwied`v (Tubifex) ntjv DEg Lv` |

Kul. I cju Dbqpb`ž

cmbtZ A# tRb ugtk| GKvRi Rb" evRvii evZvm t`l qvq hš; e`envi Kiv Ptj | A`vKvi qvtgi gvtQi Rb" uDued`v (Tubifex) ntjv DEg Lv` | GLv` A`vKvi qvtgi cmb bó nq bv| eZvrb evRvii bvbv ai#bi KwiG Lv` cvl qv hvq tm, tjv e`envi Kiv hvq| Zte KLBi AvZvi³ Lv` e`envi Ki#Z tB| gvQ hv` meUKZLv` tLq tkl Ki#Z bv cvti Zvntj tm, tjv A`vKvi qvtg ctB cmb bó Kti I A# tRtbi Afve NUvq| tevk Lvevi t_K tMtj tm, tjv mvi tq tdj tZ nte|

gvQ ubqvz cvqLvbv Kti Ges tm, tjv A`vKvi qvtgi Zjvq Rtj| G, tjv mivevi Rb" cmóK cvBtci gv_vq Rij teta Zjvq mibclubs Kti gqv` i` Kiv thtZ cvti | hv` tKvb Kvi tY Zjv AZ`mak gaj v# nq Zvntj A`vKvi qvtgi meUKzcmb cwi`vi cmb Oviv e`j Kti w`tZ nte|

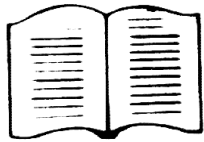


Ablyj b (Activity) t aly, Avcib GKvU A`vKvi qvtg gvQ Pvl Kivi vPšr Ki#b| A`vKvi qvtgi Kx Kx gvQ Ovoteb, Kx ai#bi Dv`c ZvtZ ivLteb, gvtQi Lv` vntmte Kx e`envi Ki#eb Ges H A`vKvi qvtgi e`vcbv Kxvte Ki#eb Zv wj Ly (Ably`100 kã)|

A`vKvi qvtgi gvtQi džKvcBv, Wcwm, DKb I Ab`vb` tivM ntZ cvti | mviw-9 Ablyvq vevfbat`vMi vPvkrmv Kiv thtZ cvti |

mviw 9 t A`vKvi qvtgi gvtQi vevfbat`vMi KvZcq vPvkrmv|

ti#Mi bvg	imqubK`e`	gvv/NbZ ₁ (ugtMót/vj t)	cóqutMi tgqv`
ZK ciRme, gvtQi DKb	cUmkqvq cvi g`v`v`v`bU	10-20	30 ugubU
Q`vK, m`v` dtkvk, tfj tFU	tgv vKvBU vM	0.1-02	GKUvbr 7 w`b
GK tKvlx c`vxi Avμgy	Kcvi mij tdU	0.15-0.3	GKUvbr 4 mBv
džKv cBv	di gvij b	15-25	GKUvbr 3 w`b



migg` A`vKvi qvtg gvQ cvj b GKvU tmšvLb e`vci | A`vKvi qvtg AvqZKvi nI qvB fij | A`vKvi qvtgi AvKvi bvbv iKg ntZ cvti | A`vKvi qvtg mth` Avtjv mivmvi cov vWK bq| A`vKvi qvtg 2-4 dš D`PZvq emvrbv DvPZ| A`vKvi qvtg cwi`vi cmb e`envi Ki#Z nte| A`vKvi qvtgi Zjvq tgvUv evvj, K# K# cv`i e`envi Ki#Z nq| A`vKvi qvtg D`vj i#oi, tPvl eo I emvix cvLbv h# gvQ OvotZ nte| A`vKvi qvtgi K# I cmb cwi`vi ivLtZ nte| A`vKvi qvtgi Dv`c`i cwi`vi tevk ntq tMtj tm, tjv tK tKtU w`tZ nte| cmbi ZvcgvLv 28-30⁰ tm: ivLtZ nte Ges c`qvRtb vUvi e`envi Ki#Z nte| cmbtZ evZvm t`l qvi Rb" hš; I vdevi e`envi Ki#Z nte| gvQK c`Zv`b cwi`vi gvZ Lv` mieivm Ki#Z nte| gvS gvS A`vKvi qvtgi Zjv cwi`vi Ki#Z nte| A`vKvi qvtgi gvtQi tivM ntj vPvkrmv Kiv m#e|



cu#VvEi gj`iqb 4.5

mi#K DEti i cu#k #UK #Py (✓) #i b|

- 1/ A`vK#i qvtgi AvKvi tKvb&ai#bi ntj fij?
K) tMj vKvi
L) e#tKv#vKvi
M) AvqZvKvi
N) #T#Kv#vKvi

- 2/ A`vK#i qvtg KZ D`PZvtq em#t#v D#PZ?
K) 0.4-3 #gUvi
L) 0.2-2 #gUvi
M) 0.1-0.5 #gUvi
N) 0.6-1.2 #gUvi

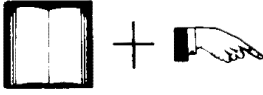
- 3/ A`vK#i qvtgi Rb` tKvb&c#b met#tq fij?
K) eb`vi c#b
L) b`xi c#b
M) bj K#ci c#b
N) c#zi i c#b

- 4/ A`vK#i qvtgi Zj vtq tKvb&ai#bi `e` e`envi Ki#Z n#e?
K) eo eo cv_i
L) #PKb emj
M) Kv`v g#U
N) tgvUv emj I K#P K#P cv_i

- 5/ A`vK#i qvtg c#bi Zicgv#v KZ _vKv D#PZ?
K) 20-25⁰ #mj #mqvm
L) 25-30⁰ #mj #mqvm
M) 27-29⁰ #mj #mqvm
N) 28-30⁰ #mj #mqvm

e'enwiK

cw 4.6 Pftlvcthvllx t`kx I wet`kx gvQ kbr³KiY

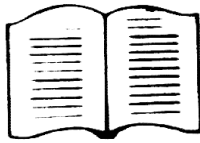


G cw tktl Avicb -

- Pftl i Dcthvllx t`kx gvQ, tjtvtK `enkó`mn kbr³ Ki tZ cvi tēb/
- Pftlvcthvllx wet`kx gvQ, tjtvtK `enkó`mn kbr³ Ki tZ cvi tēb/

Pftlvcthvllx gvQ kbr³KiY

eZgvtb evsj vt`tk wba j wLZ gvQ, tjt v cktzi Pvl Kiv nt`Q |



t`kx gvQ - KvZj v, iB, gMj, gv, i, wks/

wet`kx gvQ - wmj fvi Kvc, Mm Kvc, Kgb Kvc (KmcP), wgi i Kvc, vB micw, bvBtj wUKv, AvcdKvb gv, i |

wba j wLZ `enkó` 0vi v Gme gvQ kbr³ Kiv mae/

KvZj v (Catla catla)

fvi Z Dcgnvt`k ntZ gvj tqwqv I vBj vU chS G gvQ i we`iz. KvZj v gvQ 6 dlt chS j afntZ cvi | KvZj v b`xi gvQ |

kbr³Kvix `enkó`

gv, v eo nq, gly Dcti i w`tk vK, t`n tPv nq Ges t`ni D`PZv t`ni tgvU `N`P cūq 3 fvtMi GK fiv nq | wctVi cvLbvq 17-19 wU wkov Kuv vK | GKevi gvQU t`L tjt fjt nI qvi maebr Kg | (wP-37)

KvZj v gvQ i t`ni D`PZv t`ni tgvU `N`P cūq 3 fvtMi GK fiv nq |



wP 37 t KvZj v

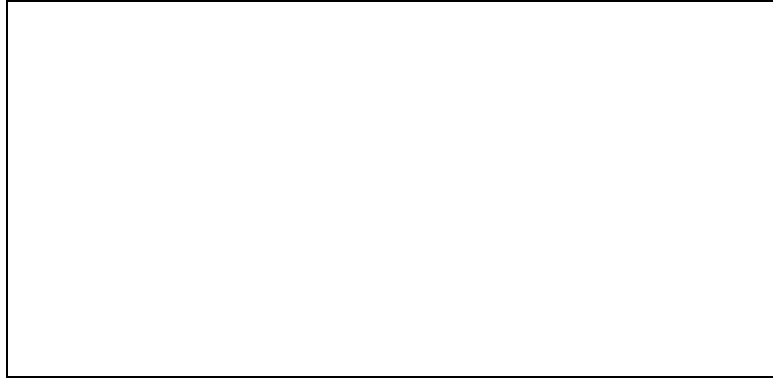
iB (Labeo rohita)

fvi Z Dcgnvt`k ntZ wgvbgi chS G gvQ i we`iz. G gvQ b`xtZ eim Kti | iB gvQ 3 dlt ev Zvi Avak j af nq |

kbr³Kvir`enkó

iB gvtQi gly wbtPi w`tK
_vtK| cō cvLbvq wko
KvUv _vtK 15-16 wU|

t`n j w`I tPbv nq| t`tni DZPZv t`tni tgvU ``tN⁹ 5 fvtMi GK fVM nq| tVwL⁹ úó
_vtK Ges tVwL AfbK fvr _vtK| iB gvtQi gly wbtPi w`tK _vtK| cō cvLbvq wko KvUv
_vtK 15-16 wU| gvtQwI wbtPi Ask j vj tP nq (wPĪ-38)|



wPĪ 38 t iB

g#Mj (Cirrhinus mrigala)

g#Mj b`xi gvQ| fvi Z Dcgnvt`k ntZ wgvqvgvi chS(Gi we`wZ| G gvQ 3 dlt ev Zvi tPtq
j w`ntZ cvti |

kbr³Kvir`enkó

t`n tPbv I j w`| gv_v tQvU, t`tni D`PZv t`tni tgvU ``tN`P cōq 6 fvtMi GK fVM _vtK|
gly wbtPi w`tK _vtK| tVwL cvZjv Ges ZvtZ tKvb gvsm tbB ev fvr tbB| G gvtQi t`tni
wbtPi Ask mv`v ntq _vtK (wPĪ-39) |



wPĪ 39 t g#Mj

GKwU gv_ i 18 BwĀ chS
j w`ntZ cvti | GwU ex
cwbi gvQ|

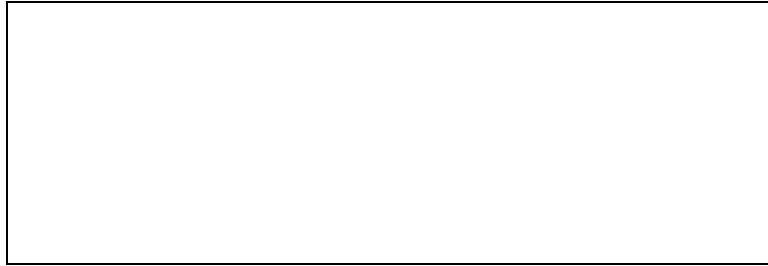
gv_ i (Clarias batrachus)

fvi Zxq Dcgnvt`k ntZ _vBj `vU I gvj tqwkqv chS(Gi we`Z| GKwU gv_ i 18 BwĀ chS
j w`ntZ cvti | GwU ex cwbi gvQ|

Kul. I c j D b q b ˘ ˘

k b v ˘ K v i x ˘ e i k ˆ

g v , i j ˘ K i j e v t m v b i j x i ˘ 0 i g v Q | g v , v i A s t k D c t i ˘ b t P t P b v | A v e i ˘ c Q t b i A s t k c v k t ˘ f v i t e P r c v | G g v t Q i M t q A v B k ˘ v t K b v | e ˘ c v L b v q ˘ ˘ k ˘ I e o K u l v ˘ v t K | c ˆ c v L b v ˘ c V n t Z t j R c h s i c t h m i Z | t ˘ k x g v , t i i A ˘ ˘ ˘ c l v j c ˆ m m e ˘ v s t k i g Z t M j ˘ v t K | G u U G i G K K ˘ e i k ˆ | A b ˘ g v , t i G g b n q b v | n v B i e W g v , t i i t e j v q G c ˆ m m ˘ K O j v j ˘ n t q t e w i t q A v t m | A b ˘ ˘ t K A ˘ ˘ c K v b g v , t i i t e j v q A ˘ ˘ ˘ c l v j c ˆ m m ˘ i f ˘ R i t K v b i g Z e v B t i t e w i t q A v t m (˘ P T - 4 0) |



˘ P T 4 0 t g v , i

˘ k s (H e t e r o p n e u s t e s f o s s i l i s)

f v i Z D c g n i t ˘ k n t Z e v g P I P x t b i A s k ˘ e t k l c h s i G i ˘ e ˘ i Z | G u U e x c m b i g v Q | G K d t c h s i G i ˘ ˘ N ˆ n t Z c i t i |

k b v ˘ K v i x ˘ e i k ˆ

˘ k s j ˘ K i j i ˘ 0 i g v Q | G i e ˘ c v L b v q ˘ e l h ˘ ˘ ˘ e o K u l v ˘ v t K | G i c ˆ c v L b v A Z ˘ s i t Q v U ˘ v t K | G i M t q t K v b A v B k ˘ v t K b v | ˘ c t v i ˘ ˘ c v t k ˘ ˘ e v q y ˘ ˘ j ˘ v t K | c ˆ t ˘ Q ˘ K i t j B Z v m n t R t P t L c t o (˘ P T - 4 1) |

˘ k s j ˘ K i j i ˘ 0 i g v Q |
G i e ˘ c v L b v q ˘ e l h ˘ ˘
˘ ˘ e o K u l v ˘ v t K | G i
M t q t K v b A v B k ˘ v t K b v |



˘ P T 4 1 t ˘ k s

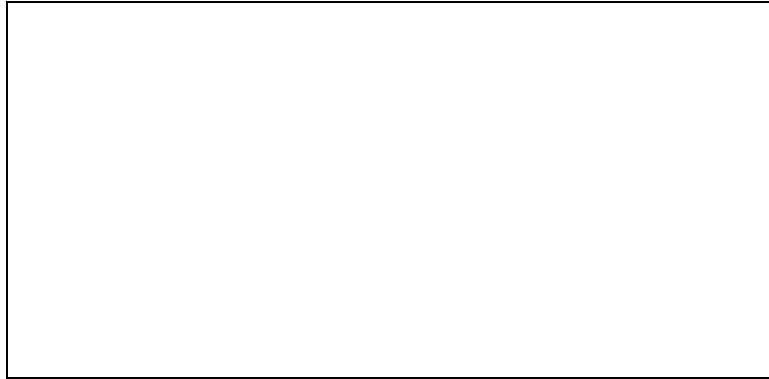
˘ m j f v i K v c ˘ (H y p o p h t h a l m i c h t h y s m o l i t r i x)

˘ m j f v i K v c ˘ P x t ˘ t k i g v Q | 1 9 6 9 m t b G t ˘ t k c ˆ g G i A v M g b N t U | P x t b i b ˘ x , t j v t Z G i e v m |

k b v ˘ K v i x ˘ e i k ˆ

t P b v P l o v t ˘ n h ˘ ˘ g v Q | t ˘ t n i M v b A t b K U v B i j k g v t Q i g Z | t c t U i ˘ b t P i A s k B i j k g v t Q i t c t U i g Z | g v t Q i M t q i i 0 i f c v j x | t ˘ t n A i A v N v Z j ˘ M t j B Z t K i ˘ ˘ R t g h v q | Z t e G t ˘ i t c t U i ˘ b t P P m c j v i g Z n v o e v S c u t e ˘ v t K b v (˘ P T - 4 2) |

˘ m j f v i K v c ˘ P x t ˘ t k i
g v Q | 1 9 6 9 m t b G t ˘ t k
c ˆ g G i A v M g b N t U |
P x t b i b ˘ x , t j v t Z G i
e v m |



IPĪ 42 t imj vri Kvc[©]

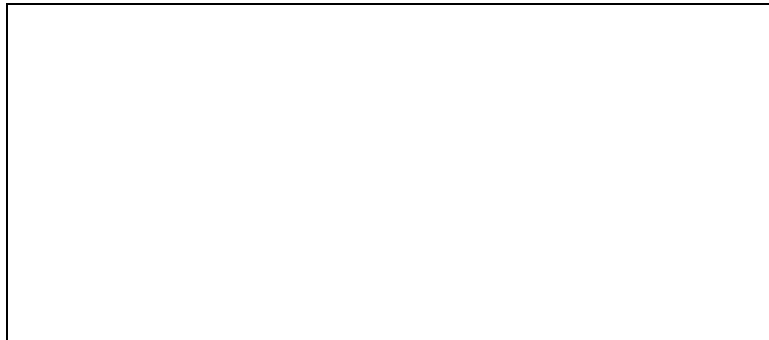
Mām Kvc[©](Ctenopharyngodon idellus)

GiU Pxbt`tki gvQ| Gt`tk 1966 mtb G gvQwUi Avg`wb nq| Pxbt`tki b`xtZ Mām Kvc[©] evm Kti |

kvb³Kvix`enkó

G gvQ gtMj gvQi gZ j`nq| Zte Gi tctUi Ask AtbK j`nq etj cvqj Ae`vb tj tRi cġq KvQvKwQ| Giv Nvm Lvq etj Gt`i tVwLmLtm ev avitjv| t`tni Zjbrq cvLbv tQvU| Mtqi iO wKQw meR (IPĪ-43)|

Mām Kvc[©]Nvm Lvq etj
Gt`i tVwLmLtm ev
avitjv|



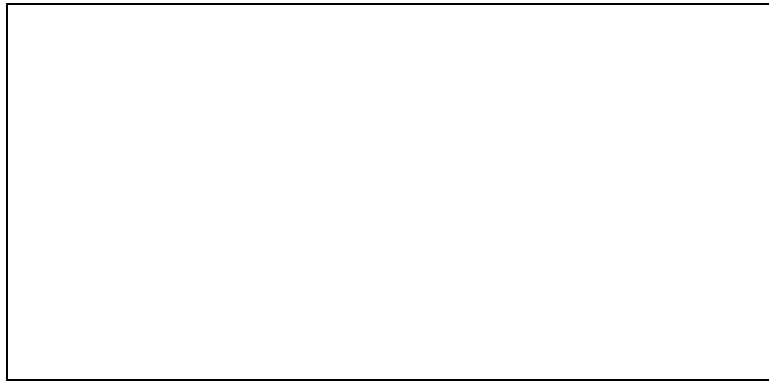
IPĪ 43 t Mām Kvc[©]

Kgb Kvc[©]Kvc[©] (Cyprinus carpio)

Kgb Kvtp[©] DrcuĒ`vb Pxb t`k ntj| GLb cv`exi eū t`tk Gi we`wZ| b`xtZ I ex cvbtZ Giv evm Kti |

kvb³Kvix`enkó

gvQwU t`Ltz LvU I tPv| tCU eo`vtK Ges cvqj Ae`vb AtbK wQtb| kixti i Zjbrq gv`v tQvU`vtK| mvi v`n AvBtk AveZ`vtK| gġLi`gvtk`w evte[©]`vtK| gġ wKQw wbtPi w`tk`vtK| cRbb Kvij cġy`ġ DftqiB tCU AZ`šldzj Dtv| Zte`ġ gvQi tCU AZ`šitenk dzj Dtv| cġ cvLbv tj tRi w`tk AtbK`i`chšie`-Z`vtK (IPĪ- 44)|



№ 44 t Kvc

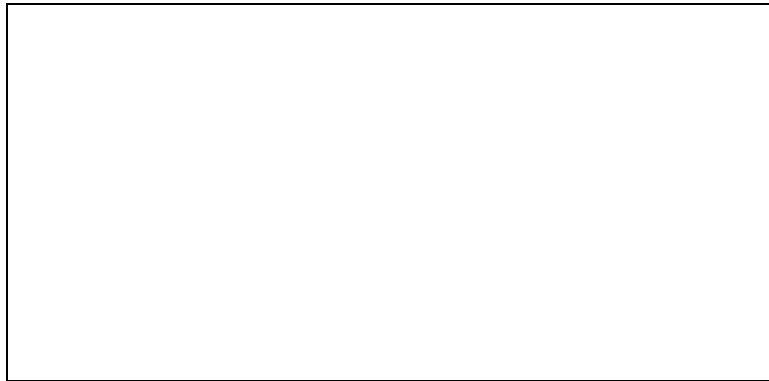
igi i Kvc (Cyprinus carpio var. specularis)

Kgb Kvc Pri i Ktgi (varieties) GKw njv igi i Kvc Gw Kgb Kvc gvtQi cRwZ fZ | bivr ai tbi cRbtbi gva tg G gvtQi Dm ntqtQ |

igi i Kvc Dtg - LthM
"enkó" ntjv tmvij x is
Ges Gi wctV I cvkfi Lvq
Aí msL "K AvBtki
Ae vb |

kbr Kvir "enkó"

gvQw tPv Ges migtb wQtb cŏq mgvfvte miyntqtQ | gvtSi Ask tek P | or | Gi
Dtg - LthM "enkó" ntjv tmvij x is Ges Gi wctV I cvkfi Lvq Aí msL "K AvBtki Ae vb
(№ 45) |



№ 45 t igi i Kvc

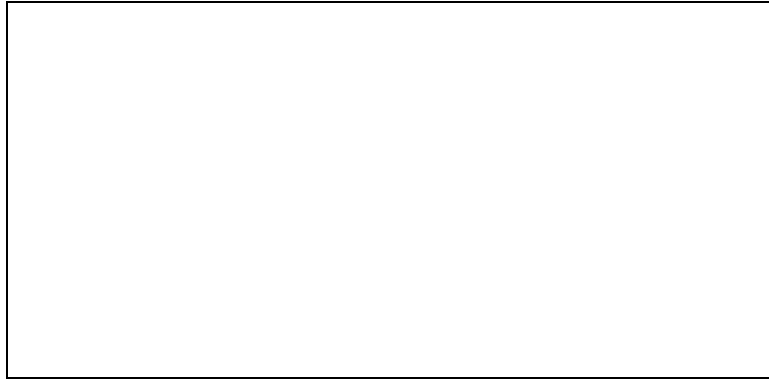
vB mic (Puntius gonionotus)

evsj vt ģk G gvQw tK ivRc ejv nq | 1977 mvtj vB vU ntZ G gvQw Avg vb Kiv
ntqtQ |

kbr Kvir "enkó"

t`kx mic Zzvq
ivRc gv v tQvU Ges
t`n A tK tPv |

G gvQw gvtQi gZ tPv Ges Gi is D3/4j ifcij x | ivRc th vb cŏ cvLv Ae vZ
tmw A tK Dcti Dtv tMtQ | t`kx mic Zzvq Gi gv v tQvU Ges t`n A tK tPv |
t`kx mic wctVi gvstm AvŠ ev cvkfi Kwv tbB | KŠ ivRc gvstm AvŠ tckxq Kwv
msL v A tK tK (№ 46) |



ጠፕ 46 t _vB mi cyd

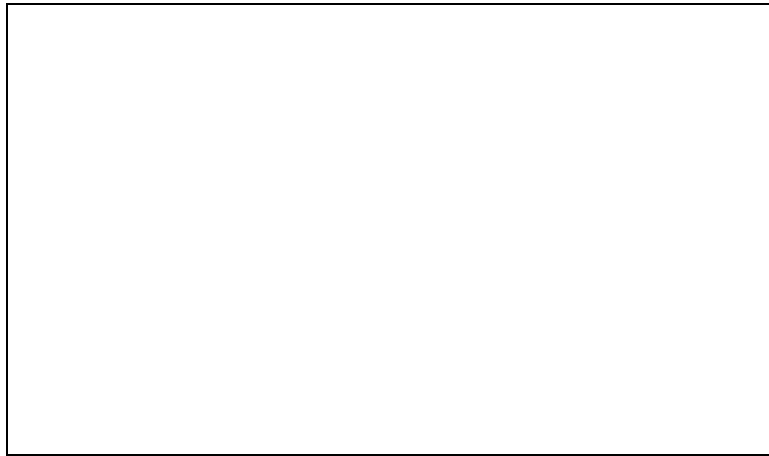
bvBtj ጠUKvi (Sarotheradon nilotica)

G gvQጠUtK 1974 ጠtj _vBj ህፀ nፗZ Avg`ጠb Kiv nፗqፗQ| GጠU tZj ጠcqv gvፗQi ፗፑፗ AtbK eo nq|

kbv³Kvix`enkó

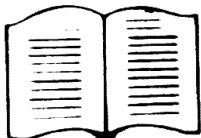
bvBtj ጠUKvi tj ፗRi cvLbvq ጠጠጠጠ Kvፗj ፕWri v_ፕK| Gፗ`i ጠፗVi Ges cvqycvLbvq k³ Kጠv AvፗQ (ጠፕ - 47)|

bvBtj ጠUKvi tj ፗRi
cvLbvq ጠጠጠጠ
Kvፗj ፕWri v_ፕK| Gፗ`i
ጠፗVi Ges cvqycvLbvq
k³ Kጠv AvፗQ|



ጠፕ 47 t bvBtj ጠUKvi

Ablyj b (Activity) t Avcbri emoi cvፗkB Pvl nፗQ Ggb 6ጠU (3 + 3) ፗ`kx I ጠፗ`kx gvQ ጠsጠፗ Kily Ges Zፕ`i kbv³Kvix`enkó Dፗj ጠceፗ Zፕ`i ህፗጠbK bvg ጠj Lly Ges h_vmgፗፗ e`enጠጠ K LvZፕፗ Gፗ`i Qጠe GፗK ጠUDUI ፗK ፗ`ጠLፗ ፗፑፗ ጠbb|



ጠviggፗ KivZj v, iፑ, gፗMj, ጠks, gv, i PፕፗIvcፗፗጠፗ ፗ`ጠk gvQ| ጠጠj Fvi Kvc, ጠጠጠ Kvc, Kgb Kvc, ጠgii Kvc, ivRcፗ, bvBtj ጠUKvi, ጠጠፗKvb gv, i PፕፗIvcፗፗጠፗ ጠፗ`kx gvQ| eፗ, gv_v, ፗ`ፗni DፗPZv, Kጠv, cvqycvLbv, is, AtbK BZ`ጠፗ ፗ`ፗL gvQ kbv³ Kiv ጠፗፗ|



cvVvĚi gjvqb 4.6

mUK DĚti i cvk UK Pý (✓) ů b |

- 1/ tKvb&gvfQi gv_v eo l gly Dcti i ů tK?
K) i B
L) g&Mj
M) KvZj v
N) ůmj fri Kvc©

- 2/ tKvb&gvfQi tVtU fvB AvfQ?
K) KvZj v
L) i B
M) g&Mj
N) Kgb Kvc©

- 3/ tKvb&gvfQi gly ůb&P Ges tVU cvZj v?
K) i B
L) KvZj v
M) g&Mj
N) ůgi i Kvc©

- 4/ tKvb&gvfQi Mrtq AvB&ki msL'v Af?
K) Kgb Kvc©
L) i vRc&W
M) KvZj v
N) ůgi i Kvc©

- 5/ tKvb&gvfQi ůctVi Ges cvqjy cvLbvq k³ KvUv AvfQ?
K) ůks
L) gv_s i
M) bvB&tj ůUKv
N) ůgi i Kvc©



Povšgji`iqb

msuŋB I iPbvji-K ckae

- 1/ gvQ Pvl i cŋ_ugK ubYŋKmgŋ gvŋQi Drcv`btK Kxfvte cŋmeZ Kti Zv e`Lv Kily|
- 2/ Pvl i ubvgtE cŋwZ ubeŋtbi Rb` thme `enkó` ubeŋPb Kiv cŋqvRb Zvi Zvij Kv cŋvb Kily|
- 3/ cŋzi tKvb&tKvb&cŋwZi gvQ Kx nŋti Qvoteb? tKvb&cŋwZ cmbi tKvb&`ŋi Lv` MhY Kti Zv Dŋj L Kily|
- 4/ ivRcŋi GKK Pvl cŋwZ eYŋv Kily|
- 5/ ugk`Pvl i cŋwZ eYŋv Kily|
- 6/ tcvbv Qvovi ubqg eYŋv Kily|
- 7/ Lvŋq gvQ Pvl cŋwZ eYŋv Kily|
- 8/ tPŋer`Pvq gvQ Pvl cŋwZ eYŋv Kily|
- 9/ avb tŋŋZ gvŋQi Pvl cŋwZ eYŋv Kily|
- 10/ gvQ I gjwMi mgwŋZ Pvl eYŋv Kily|
- 11/ gŋ Rj vktq gvŋQi Drcv`b Kŋg hvl qvi Kvi Y, tŋ v ij Lŋj|
- 12/ Kx Kx Dcvq Aej =b Kiŋj gŋ Rj vktq gvŋQi Drcv`b eivotbv m=ŋ Zv eYŋv Kily|
- 13/ GKwU A`vKwz qvg emvevi `vb tKgb nI qv DŋPZ Zv ij Lŋj|
- 14/ A`vKwz qvtgi cmb Kx Kx KviŋY Acwŋ`vi nq Ges Kxfvte Zv cwi`vi KiŋZ nq ij Lŋj|
- 15/ A`vKwz qvtgi gvŋQi tiwM nŋj Kxfvte wPwKrmv KiŋZ nŋe Zv eYŋv Kily|
- 16/ ivRcŋi Ges gv, i gvŋQi `enkó` eYŋv Kily|
- 17/ t`kx I weŋ`kx gvŋQi Avj v`v Avj v`v Zvij Kv cŋvb Kily|



DĚigvjv

cW 4.1

1| M 2| M 3| L 4| M 5| M

cW 4.2

1| M 2| L 3| L 4| L 5| L

cW 4.3

1| L 2| M 3| L 4| L 5| L

cW 4.4

1| L 2| M 3| N 4| M 5| L

cW 4.5

1| M 2| N 3| M 4| N 5| N

cW 4.6

1| M 2| L 3| M 4| N 5| M

BDibU 5 iPsiO Pvl

iPsiO Pvl evsjv`tki Rb` AZ`sl , iZcYf miv cv_extZ iPsiO Pvn`v erovi dtj ewnefk;l evsjv`tki iPsiO Pvn`v ewx cvt`Q| MZ GK `kK evsjv`tk iPsiO Drcv`b e`vcKfite tetotQ| evsjv`tk eZgvtb 1,40,000 tn±i RigtZ iPsiO Pvl nt`Q| evsjv`tk iPsiO Pvl thvM` AtbK , tjt cRwZ _vKtjI eZgvtb c`vbZ Mj`v I eM`v iPsiO Pvl nt`Q| Mj`v igVv cmbi Ges eM`v tjt vbr cmbi iPsiO | iPsiO PvlI `vb ubevPb AZ`sl , iZcYf `vb ubevPbi ci cKz Lbb, cmb mieivn, tcvbr Ovovi nvi, Lv` I mri c`qM Lg , iZcYf iPsiO tcvbr Ovovi thgb mgq AvtQ tZgub iPsiO eo nlqvi ci AvnitYiI mgq AvtQ| mWK cxwZtZ iPsiO AvniY Kti evRiRvZ KiZ cvi tj Pvlxv jvferb nteb|

G BDibU iPsiO m`ut`i , iZi I PvlI cUfig, `v`yl tjt vbr cmbi iPsiO cRwZ Ges evsjv`tk Pvl thvM` cRwZ, evsjv`tk eZgvtb wevfbecKvi iPsiO Pvl cxwZ, iPsiO PvlI `vb ubevPb, eM`v I Mj`v iPsiO Pvl cxwZ I e`v`vcbv, iPsiO AvniY, AvniY Kv tj j`Yxq nelq, Mj`v I eM`v iPsiO ti Yykbv³KiY m`ut`K`e`w Z Avtj vPv Kiv ntqtQ|

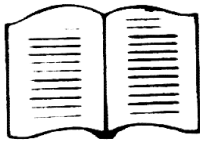
cW 5.1 iPsiO m`ut`i , iZi I PvlI cUfig, `v`yl tjt vbr cmbi iPsiO cRwZ Ges evsjv`tk Pvl thvM` cRwZ



G cW tkI Avcib –

- iPsiO m`ut`i , iZi I PvlI cUfig eY`v KiZ cvi teb|
- `v`yl tjt vbr cmbi iPsiO cRwZi big RvbtZ cvi teb|
- evsjv`tk Pvl thvM` iPsiO cRwZi big Djt L KiZ cvi teb|

iPsiO m`ut`i , iZi I PvlI cUfig



evsjv`k iPsiO m`ut` LgB mgx| eZgvtb evsjv`tki gntmivcib AAjt i AvqZb 27,000 eM`vBj | evsjv`tki 2q cAewl R cwi Kiv bq gntmivcib AAjt i cwi gvY t`Lvtrv ntqtQ 20-50 j` j tn±i | gntmivcib AAjt i clq 6 j` j tn±i figtZ g`vbtMof ebfig we`gvb| tPov Ki tj Gme fig ntZ 2.0-2.5 j` j tn±i fig iPsiO PvlI Avl Zvq Avbv m`e|

eZgvtb evsjv`tki DcKj xq AAjt clq 1,40,000 tn±i RigtZ iPsiO Pvl nt`Q| Gi gvtS Ljvbr AAjt clq 1,10,000 tn±i I K- evRi AAjt clq 30,000 tn±i |

eZgvtb evsjv`tki DcKj xq AAjt clq 1,40,000 tn±i RigtZ iPsiO Pvl nt`Q | Gi gvtS Ljvbr AAjt clq 1,10,000 tn±i I K- evRi AAjt clq 30,000 tn±i | 1989-90 mvtj iPsiO PvlI Rigi cwi gvY wj 64,000 tn±i | grm` Ana`Bti i Z` Abbvqx evsjv`tk tgvU iPsiO Drcv`tbi cwi gvY 1,10,790 tgvUK Ub| G Drcv`tbi 4,188 tgvUK Ub GtmtQ Uj vi KZR| j`z` tRtj iv AvniY Kti tQ 19,545 tgvUK Ub| DcKj xq Lvgrv ntZ GtmtQ 26,335 tgvUK Ub| Ab`vb` Dcvtq AvniZ ntqtQ 60,722 tgvUK Ub| 1997-98 mvtj evsjv`k iPsiO i Bmb Kti `et`wkK gyv Avq Kti tQ 11,745 tkvU UvKv| i BmbKZ. iPsiO cwi gvY wj 22,054 tgvUK Ub| i agvI iPsiO tcvbr aivi KvRB RwoZ itqtQ 2-5 j` j tj vK| iPsiO Drcv`b I c`lqvRvZKiY KvR clq 1.5-2 j` j tj vK RwoZ AvtQ|

Kul. I cj. Dbqb ģ

«Pšio mēut`i , iġi Dcġwä Kti evsjv`k mi Kvi «Pšio Drcv`tb mvinh` Kivi Rb` 2000 mij chšl Avav ubieo Pti I mi Kvi cwi Kíbv cġq Ppvšl Kti tQ| Gmgġq «Pšioi Drcv`b j`ġl` gvġv aiv ntqġQ 4,32,000 ġmġK Ub Ges G Drcv`b ntZ mēe` Avq` wvġe 8,000 tKvU UvKv|

eZġvġb «Pšio iBvb Kti th Avq nq (11,745 tKvU UvKv) Zvi cwi gvY RivZiq Avġqi 5.12%| evsjv`tk «Pšioi Pvl thvM` th cwi gvY RivZ AvġQ Zv t`ġK AvZ mntRB «Pšioi Drcv`b e`vcK nvi evovġbv mēe| Gi dtġ RivZiq Avġq «Pšioi Ae`vb Avi I evovġbv mēe| hZB w`b hvġ`Q «Pšio Pvl xiv I evsjv`k mi Kvi RivZiq chġq «Pšio Drcv`tbi Rb` Pti I cġZ , iġi cġvb Ki tQ|

ġ`yl tj vbv cmbi «Pšio cġvZ

evsjv`tki ġ`yl tj vbv cmbtZ cġq 60mU «Pšioi cġvZ t`LġZ cvl qv hvq| Gme cġvZi AvakvskB *Macrobrachium*, *Palaemon*, *Penaeus*, *Metapenaeus*, *Parapenaeopsis* | *Acetes* MġYi Aš fġ |

Macrobrachium MġYi cġvZ , tj v ġvVv cmb I Clr jeYv³ cmbtZ evm Kti |

Palaemon MġYi me , tj v cġvZ ġvVv cmbtZ evm Kti (1mU cġvZ Qvov)

Penaeus MġYi me , tj v tj vbv cmbtZ ev mgġ^a evm Kti |

Metapenaeus MġYi me , tj v cġvZ tj vbv cmb ev mgġ^a evm Kti |

Parapenaeopsis MġYi me , tj v cġvZ mgġ^a cvl qv hvq |

Acetes MġYi cġvZ mgġ^a I Clr tj vbv cmbtZ evm Kti |

Solenocera, *Trachypenaeus*, *Hippolytina*, *Heterocarpus*, *Plesionika*, *Metapenaeopsis*, *Leptocarpus*, MġYi cġvZ mgġ^a tj vbv cmb ev mgġ^a evm Kti |

evsjv`tk Pvl thvM` «Pšio cġvZ

evsjv`tk ubvġġ mZ «Pšioi cġvZ , tj vi Pvl mēe|

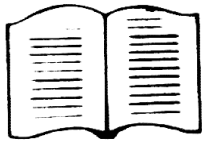
evsj v big	%AvbK big	Avem`f
evM`v «Pšio	<i>Penaeus monodon</i>	tj vbv cmb
Pvc`v «Pšio	<i>Penaeus indicus</i>	tj vbv cmb
tWivvKivUv «Pšio	<i>Penaeus Japonicus</i>	tj vbv cmb
evMZvi v «Pšio	<i>Penaeus semiculcutus</i>	tj vbv cmb
tKvj v «Pšio	<i>Penaeus merguensis</i>	tj vbv cmb
nvi bv «Pšio	<i>Metapaeneus monceros</i>	tj vbv cmb
KPzi «Pšio	<i>Metapaeneus lysianassa</i>	tj vbv cmb
nivbv «Pšio	<i>Metapaeneus brevicornis</i>	tj vbv cmb
evMZvi v / iWv «Pšio	<i>Parapenaeopsis stylifer</i>	tj vbv cmb
iWv «Pšio	<i>Parapenaeopsis sculptilis</i>	tj vbv cmb
LBov «Pšio	<i>Parapenaeopsis uncta</i>	tj vbv cmb
Mj`v «Pšio	<i>Macrobrachium rosenbergii</i>	ġ`ycmb
QUKv «Pšio	<i>Macrobrachium malcolmsonii</i>	ġ`ycmb

Kul.1 cju Dbqb 7

evsj vt`tk eZ@vrb e`vcK
nvfi eM`v wPswoi Pvl
nt`Q | GuU tj vbr cmbi
cRwZ Ges Dckj
Gj vKvq Gi Pvl nt`Q |

evsj vt`tk eZ@vrb e`vcK nvfi eM`v wPswoi Pvl nt`Q | GuU tj vbr cmbi cRwZ Ges Dckj
Gj vKvq Gi Pvl nt`Q | eM`v wPswoi tcvbi mt`_ Pvc`v I tWwivKvUv wPswoi tcvbi tNfi ev
cKzi Xzk _vtK | G_ tju eM`v wPswoi mt`_B eo nq Ges evRviRvZ Kiv nq | mtPZb
Pvlxiv tcvbr evQvB Kfi eM`v wPswoi GKK Pvl Kfi _vtKb | Pvc`v ev tWwivKvUv wPswoi
GKK Pvl GLbl evsj vt`tk nt`Q br |

wgVvcmbi wPswoi mt`_ eZ@vrb tKej Mj`v wPswoi Pvl nt`Q Ges QUKv wPswoi Pvl I AwZ
mntR Kiv m`e |



miigg evsj vt`tki gnxtmrcvb AA`tj i cwi grY 27000 eM@vBj | gnxtmrcvb AA`tj i c@q 6
j 7 tn±i RngtZ g`vbtMf ebfug we`gub | eZ@vrb evsj vt`tk 1,40,000 tn±i RngtZ
wPswoi Pvl nt`Q | eZ@vrb wPswoi me`gvU Drcv`b 1,10,790 tgt Ub | 1997-98 mtj
wPswoi iBwib Kfi Avq ntqtQ 11,745 tKwU UvKv | 2000 mtj wPswoi Drcv`tbi j 7`gvIv
4,32,000 tguUK Ub | evsj vt`tk 7`yI tj vbr cmbtZ wPswoi c@q 60 wU cRwZ cvl qv hvq |
eZ@vrb *Penaeus monodon* Ges *Macrobrachium rosenbergii* Gi Pvl nt`Q |
c`_guU tj vbr cmbi Ges wZxquU 7`yev wgVv cmbi |



cvfVvEi gj`iqb 5.1

mWk DEti i cvk Wk WPy (✓) w b|

- 1/ evsj vt`tki gnxtmivcib AAjtj i cwi gvY KZ?
K) 10000 eM@vBj
L) 18,000 eM@vBj
M) 25,000 eM@vBj
N) 27,000 eM@vBj

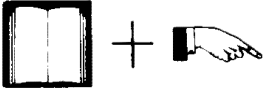
- 2/ evsj vt`tk eZ@vrb Wk cwi gvY RvgtZ WPsioi Pvl nt`Q?
K) 90,000 tn±i
L) 1,10,000 tn±i
M) 1,30,000 tn±i
N) 1,40,000 tn±i

- 3/ 2000 mrtj evsj vt`tki WPsio Drcv`tbi j qj`gvT v KZ?
K) 3,88,000 tgvWk Ub
L) 4,20,000 tgvWk Ub
M) 4,32,000 tgvWk Ub
N) 4,42,000 tgvWk Ub

- 4/ evsj vt`tk `v`y tj vbr cvmbi KZwU cRvWZ AvtQ?
K) 40 WJ
L) 50 WJ
M) 60 WJ
N) 65 WJ

- 5/ eZ@vrb tKvbRvWZi WPsio Pvl nt`Q ?
K) *Acetes sp*
L) *Palaemon sp*
M) *Metapaeneus sp*
N) *Penaeus sp*

cw 5.2 eisj v˘tk eZḡv̄b veifboc̄kvi v̄Psv̄o Pvl c×v̄z

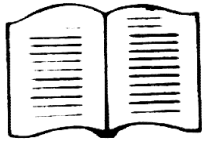


G cw tk̄t̄l Av̄c̄v̄b –

- tN̄ti v̄Psv̄o Pvl m̄ūt̄K̄eȲv̄v̄ Kīt̄Z cvīteb|
- avb t̄q̄t̄Z v̄Psv̄o Pvl m̄ūt̄K̄Av̄t̄j v̄Pbv̄ Kīt̄Z cvīteb|
- jeY Drcv̄`t̄bi t̄q̄t̄Z v̄Psv̄o Pvl m̄ūt̄K̄e˘v̄L˘v̄ Kīt̄Z cvīteb|
- c̄k̄zi Mj˘v̄ v̄Psv̄o Pvl m̄ūt̄K̄eȲv̄v̄ Kīt̄Z cvīteb|

eisj v˘tk eZḡv̄b veifboc̄kvi v̄Psv̄o Pvl c×v̄z

eisj v˘tk eZḡv̄b v̄b=̄q̄ v̄LZ Dc̄v̄t̄q̄ ev̄M˘v̄ I Mj˘v̄ v̄Psv̄o Pvl n̄t̄Q t



- tN̄ti v̄Psv̄o Pvl
- avb t̄q̄t̄Z v̄Psv̄o Pvl
- jeY Drcv̄`t̄bi t̄q̄t̄Z v̄Psv̄o Pvl
- c̄k̄zi Mj˘v̄ v̄Psv̄o Pvl

t̄N̄ti v̄Psv̄o Pvl

cw̄b Dbq̄b teW̄q̄h̄me tev̄i vi v̄bq̄v̄ȳ K̄t̄īt̄Q tm̄me tev̄i v̄t̄i i ev̄B̄ti I v̄fZ̄ti t̄Ni ˘Z̄vi K̄t̄i v̄Psv̄o Pvl n̄t̄Q | Āt̄bK̄ eo Ḡj v̄K̄v̄ R̄j̄o D̄P̄zēra v̄t̄q̄ t̄Ni ˘Z̄vi K̄iv̄ n̄q| A_̄P̄ D̄P̄zēra v̄t̄q̄ v̄b=̄q̄ c̄v̄i ḡv̄Ȳ R̄ūḡi P̄v̄i v̄t̄K̄ t̄Ni t̄`q̄v̄ n̄q| t̄N̄ti c̄v̄b i v̄L̄v̄ n̄q 0.6-0.9 v̄ḡŪvi | t̄N̄t̄i i Av̄K̄vi 3-195 t̄n̄±i ch̄S̄l̄n̄t̄Z̄ c̄v̄t̄i | t̄N̄t̄i t̄R̄v̄q̄v̄t̄i c̄v̄b h̄v̄l̄ q̄v̄ Av̄m̄vi R̄b˘ v̄ḡm̄ t̄M̄U˘_v̄t̄K̄| v̄M̄t̄m̄t̄-R̄v̄b̄ḡv̄i x̄ ev̄ t̄c̄S̄l̄ ḡv̄t̄m̄ t̄N̄t̄i t̄j̄v̄b̄v̄ c̄v̄b X̄K̄v̄t̄b̄v̄ n̄q| K̄iv̄Ȳ Ḡ m̄ḡq̄ v̄Psv̄o t̄c̄v̄b̄v̄i c̄v̄i ḡv̄Ȳ m̄ēt̄P̄t̄q̄ t̄ēw̄k̄ _v̄t̄K̄| Ḡ m̄ḡq̄ c̄v̄b̄i j̄eȲv̄³Z̄v̄ _v̄t̄K̄ 7-8%| c̄v̄q̄ 1 ḡv̄m̄ m̄ḡq̄ āt̄i t̄Ni _t̄j̄v̄t̄Z̄ t̄c̄v̄b̄v̄i X̄K̄v̄t̄b̄v̄ n̄q| Āḡv̄ēv̄ I c̄v̄Ȳḡv̄t̄Z̄ m̄ēt̄P̄t̄q̄ t̄ēw̄k̄ t̄c̄v̄b̄v̄i X̄t̄K̄| Ḡ Ae˘v̄q̄ t̄c̄v̄b̄v̄i m̄sL˘v̄ v̄b̄āf̄Ȳ K̄iv̄ m̄ē b̄q| Z˘ḡv̄i v̄Psv̄o t̄c̄v̄b̄v̄i m̄v̄t̄_ ḡv̄t̄Q̄i t̄c̄v̄b̄v̄i X̄t̄K̄| Z̄t̄e eZ̄ḡv̄t̄b̄ Āt̄b̄t̄K̄ t̄c̄v̄b̄v̄i v̄K̄t̄b̄ c̄v̄Z̄ t̄n̄±t̄i 22500-25000v̄U t̄c̄v̄b̄v̄i t̄Q̄to _v̄t̄K̄b Ges t̄N̄t̄i m̄ūt̄K̄ L̄v˘ e˘v̄v̄i K̄t̄i _v̄t̄K̄b| m̄ūt̄K̄ L̄v˘ miēi v̄n̄ Kīt̄j̄ Drcv̄`b ˘v̄ōv̄q̄ 300-500 t̄K̄v̄R̄/t̄nt| ev̄M˘v̄ v̄Psv̄o P̄v̄t̄l̄i t̄ēj̄v̄q̄ Ḡ v̄bq̄q̄ c̄v̄h̄v̄R̄˘| R̄j̄v̄B̄ ḡv̄t̄m̄i ḡv̄S̄v̄ḡv̄S̄ m̄ḡt̄q̄ v̄Psv̄o aiv̄ īi ȳn̄q| t̄N̄t̄i Mj˘v̄ v̄Psv̄o P̄v̄t̄l̄i t̄ēj̄v̄q̄ Av̄M̄÷ ḡv̄t̄m̄ t̄c̄v̄b̄v̄i Q̄v̄ov̄ n̄q| Ḡ m̄ḡq̄ ēv̄v̄i c̄v̄b̄t̄Z̄ t̄Ni _t̄j̄v̄ f̄t̄i h̄v̄q̄ Ges c̄v̄b̄i j̄eȲv̄³Z̄v̄ K̄t̄ḡ h̄v̄q̄| Ḡ m̄ḡq̄ avb̄ t̄iv̄c̄Ȳ K̄iv̄ n̄q| Av̄ḡb̄ av̄t̄b̄i m̄v̄t̄_ c̄v̄Z̄ t̄n̄±t̄i 7500v̄U Mj˘v̄ v̄Psv̄o t̄c̄v̄b̄v̄i Q̄v̄ov̄ n̄q| v̄Psv̄o _t̄j̄v̄t̄K̄ b̄t̄f̄āt̄ Ges t̄d̄ēs̄v̄i x̄i v̄fZ̄i aiv̄ n̄q| Ḡ c̄x̄v̄z̄t̄Z̄ c̄v̄Z̄ t̄n̄±t̄i Mj˘v̄ v̄Psv̄o Drcv̄`b ˘v̄ōv̄q̄ 50-75 t̄K̄v̄R̄|

D̄P̄zēra v̄t̄q̄ v̄b=̄q̄ c̄v̄i ḡv̄Ȳ R̄ūḡi P̄v̄i v̄t̄K̄ t̄Ni t̄`q̄v̄ n̄q| t̄N̄t̄i c̄v̄b i v̄L̄v̄ n̄q 0.6-0.9 v̄ḡŪvi | t̄N̄t̄i i Av̄K̄vi 3-195 t̄n̄±i ch̄S̄l̄n̄t̄Z̄ c̄v̄t̄i |

t̄N̄t̄i Mj˘v̄ v̄Psv̄o P̄v̄t̄l̄i t̄ēj̄v̄q̄ Av̄M̄÷ ḡv̄t̄m̄ t̄c̄v̄b̄v̄i Q̄v̄ov̄ n̄q|

avb t̄q̄t̄Z v̄Psv̄o Pvl

avb t̄q̄t̄Z hL̄b Mj˘v̄ v̄Psv̄o Pvl K̄iv̄ n̄q ZL̄b avb t̄q̄t̄Zi Av̄B̄j̄ t̄ēt̄a 0.5-1.0 v̄ḡŪvi M̄f̄xi c̄v̄b i v̄L̄v̄i e˘e˘v̄v̄ K̄iv̄ n̄q| Z̄v̄i c̄i c̄v̄Z̄ t̄n̄±t̄i 10,000 – 15,000v̄U t̄c̄v̄b̄v̄i Q̄v̄ov̄ n̄q| t̄c̄v̄b̄v̄i Q̄v̄ov̄i m̄ḡq̄ Av̄M̄ó ḡv̄m̄| v̄Psv̄o t̄K̄ Ḡ m̄ḡq̄ m̄ūt̄K̄ L̄v˘ miēi v̄n̄ Kīt̄Z̄ n̄q| t̄d̄ēs̄v̄i x̄i ḡv̄t̄m̄i v̄t̄K̄ v̄Psv̄o aiv̄ n̄q| c̄v̄Z̄ t̄n̄±t̄i v̄Psv̄o Drcv̄`b 250-350 t̄K̄v̄R̄ n̄t̄Z̄ c̄v̄t̄i |

j̄eȲ Drcv̄`t̄bi t̄q̄t̄Z v̄Psv̄o Pvl

j̄eȲi t̄q̄t̄Z v̄Psv̄o Pvl P̄ĀM̄ó̄ḡ I K̄. ev̄R̄vi Ḡj̄v̄K̄v̄t̄Z̄B̄ ḡj̄-Z̄ n̄t̄q̄ _v̄t̄K̄| ēl̄v̄K̄v̄t̄j̄ j̄eȲ Drcv̄`b n̄q̄ b̄v̄| Z̄v̄B̄ D³ m̄ḡt̄q̄ t̄R̄v̄q̄v̄t̄i c̄v̄b̄i m̄v̄t̄_ v̄Psv̄o I b̄iv̄b̄v̄ R̄v̄t̄Z̄i ḡv̄t̄Q̄i t̄c̄v̄b̄v̄i X̄t̄K̄| Ḡm̄e t̄c̄v̄b̄v̄i j̄eȲ t̄q̄t̄Z̄ 2-3 ḡv̄m̄ Av̄ŪM̄K̄t̄q̄ t̄īt̄L̄ aiv̄ n̄q| Ḡ t̄q̄t̄ī Drcv̄`b ˘v̄ōv̄q̄ 180-275 t̄K̄v̄R̄/t̄n̄±i | Ḡ āīt̄Ȳi P̄v̄t̄l̄ ev̄M˘ v̄m̄n̄ Ab˘v̄b˘ t̄j̄v̄b̄v̄i c̄v̄b̄i v̄Psv̄o Pvl n̄t̄q̄ _v̄t̄K̄|

čkʒi wPsioi Pvl

evM`v wPsioi Pvl i Rb` tjbv cmbi člqvRb nq Ges cmbi mtefĚg j eYv³Zv _vKtZ nq 15-25 wciwU (Parts per thousand) | cmbi MfxiZv _vKtZ nq 1-1.5 wguvi | čkʒi i Avkvi 1 GK i nĚZ 25-30 GK i chŚl nĚZ cġti | 30-50 wgt wgt Avkvti i 15,000-30,000 wU/tnt nvti (nij Kv wbieo) ev 30,000-50,000 wU/tnt nvti (Avav wbieo Pvl i Rb`) tcvbv QvotZ nq | GtZ tn±i člZ Drcv`b `wvte 1000-13000 tKwR | evsj vt`k čkʒi wPsio Pvl mtefĚ 5-6 Ub/tn±i m±e nĚtqQ | Zte cū_exi tKvb tKvb t`tk G Drcv`b 30-50 Ub/tn±i/eQi chŚl m±e nĚtqQ | Mj`v wPsio Pvl i Rb` čkʒi i cmbi j eYv³Zv člqvRb 0.4 wciwU Ges cmbi MfxiZvi člqvRb 1.0-1.5 wguvi | čkʒi i Avkvi KtqK kZisk nĚZ KtqK GK i chŚl nĚZ cġti | čkʒi tcvbv Qvovi nvi 10,000-50,000 wU/tnt | m±uġK Lv`` ev mlyg Kwlg Lv`` e`envi Ki tj Drcv`b `wvte 800-1500 tKwR |

cmbi mtefĚg j eYv³Zv
_vKtZ nq 15-25 wciwU |

Mj`v wPsio Pvl i Rb`
čkʒi i cmbi j eYv³Zv
člqvRb 0.4 wciwU |



Ablyj b (Activity) t Avcbri Gj vKvq th c×wZtZ wPsio Pvl nĚQ Zv eYv Kily Ges H Gj vKvq wPsioi Drcv`b evotbvi Rb` tKvb c×wZ mefĚq fvj nte tm m±uġK Avcbri myúo gZigZ eYv Kily (Ablyj 150 ká) |

Dcġi thme Pvl i K_v ev v nġv tm_tj vtK e`e`vcbvi w`K w`tq web`vm Ki tj w`wġ wLZ fvtM fvm Kiv hvq t

- mbvZb c×wZtZ Pvl
- Avav wbieo Pvl
- wbieo Pvl

mbvZb c×wZtZ Pvl

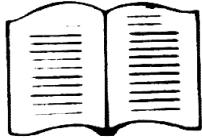
tNi, j eġYi tġZ, avb tġZ I čkʒi mbvZb c×wZtZ AġbK tġtġB wPsio Pvl nĚQ | G c×wZtZ Ablyb wfwĚK nvti tcvbv Qvov nq Ges člKwZK Lv`i I ciB wPsioi Drcv`b wbfĚ Kti | G aiġbi Pvl Ab` čRwZi gvQ I wPsioi cvl qv hvq | G tġtġ Drcv`b 135-185 tKwR/tnt nq |

Avav wbieo Pvl

Ab` w`tk Avav wbieo Pvl wntme Kti tcvbv Qvov nq Ges wPsioi Rb` m±uġK Lv`` e`envi Kiv nq | ZvQvov Rjvktqi cmb e`tji e`e`vl _vtK | čkʒi wPsioi gRž nvi 30,000-50,000 wU/tnt nĚZ cġti | G c×wZtZ Drcv`b 1-4 tgt Ub/tnt chŚl nĚZ cġti |

wbieo Pvl

wbieo Pvl i tejvq čkʒ tQvU _vtK | čkʒi n`vPmi Drcv` Z GKK čRwZi tcvbv Qvov nq | čkʒi gRž nvi 2,80,000 wU/tnt chŚl nĚZ cġti | čkʒi Av` tRb mieivn Kievi Rb` evZvtmi cvú e`eüZ nq | wPsioġK Dbž gvġbi Kwlg Lv`` t`qv nq | wbgwZ cmb e`j Kiv nq Ges čkʒ t`tk wPsioi gj I Ab`v` RweK AveRb mi vtbi e`e`v Kiv nq | G tġtġ Drcv` tbi nvi 10 tgt Ub/tnt/eQi ev Zvi tġtġ AġbK temkI nĚZ cġti | evsj vt`k čvzb mbvZb c×wZtZ wPsioi Pvl nĚQ |



mvi gg 1/1m⁺-RvbsvixZ tNti tjvbr cwb XukTq eM^v Psvoi Pvl Kiv nq/ Gme Psvoi aiv nq RjvB gv^m Mj^v Psvoi Pvl Kivi Rb⁺ AvM⁺ gv^m tNti tcvbr Qvov nq/ G mgq e⁺oi cwb⁺Z tNi f⁺i hvq Ges jeYv³Zv A⁺bK K⁺g hvq/ tNti Mj^v Psvoi b⁺f⁺ - tde⁺vi xZ aiv nq/ avb t⁺q⁺Z Mj^v Psvoi Pvl Kivi Rb⁺ c⁺U⁺Z tn⁺ti 10,000-15,000 uU/tcvbr Qvov nq/ jeY Drcv⁺ b⁺i t⁺q⁺Z el⁺kv⁺tj eM^v Psvoi Pvl Kiv nq/ el⁺kv⁺tj jeY Drcv⁺ b⁺i t⁺q⁺Z tRvqv⁺ii cwb⁺i mv⁺ Psvoi I gv⁺Qi tcvbr X⁺zk/ c⁺kv⁺zi eM^v Psvoi Pvl i Rb⁺ cwb⁺i Mfxi Zv ivL⁺Z nq 1-1.5 ugUvi/ jeYv³Zv ivL⁺Z nq 25-30 ucuciuU/ nij Kv ubv⁺eo Pvl Drcv⁺ b⁺ nq 1000-1300 tKwR/tnt/ Ab⁺ w⁺tk Avav ubv⁺eo Pvl Drcv⁺ b⁺ nq 5-6 Ub/ Mj^v Psvoi c⁺kv⁺zi i Mfxi Zv 1.0-1.5 ugUvi ivL⁺Z nq/ cwb⁺i jeYv³Zvi c⁺kv⁺Rb 0.4 ucuciuU/ G⁺tZ Drcv⁺ b⁺ nq 800-1500 tKwR/tnt/ mbvZb c⁺x⁺zi Pvl i tejvq tcvbr Qvov nq Absv⁺b w⁺f⁺Ek Ges c⁺kv⁺ZK Lv⁺ i Dci Drcv⁺ b⁺ w⁺f⁺kv⁺ | Ab⁺ w⁺tk Avav ubv⁺eo Pvl w⁺tkme K⁺ti tcvbr Qvov nq Ges m⁺u⁺ik Lv⁺ I mvi e⁺envi Kiv nq/ evsv⁺t⁺tk c⁺kv⁺Z mbvZb c⁺x⁺zi Psvoi Pvl n⁺t⁺Q/

cuVvEi gj`iqb 5.2



mWk DEti i cuK Wk iPy (✓) i b|

- 1| tNti KLb tj vbr cwb XKvZ nq?
K) RjvB - AvM÷
L) A±vei - btf=†
M) Wtm=† - Rvbgvix
N) tdeyrix - gvP©

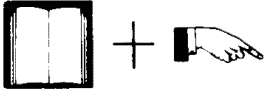
- 2| evM`v iPsiwi cKzi i cwbi Mfxi Zv KZ nI qv DvPZ?
K) 0.5 - 1.0 ugUvi
L) 1.0 - 1.5 ugUvi
M) 1.5 - 2.0 ugUvi
N) 2.0 - 2.0 ugUvi

- 3| Mj`v iPsiwo Priti Rb` cKzi i cwbi jeYv³Zv KZ nI qv cQvRb?
K) 0.1 iCiCiU
L) 0.2 iCiCiU
M) 0.4 iCiCiU
N) 0.6 iCiCiU

- 4| cKzi Mj`v iPsiwi tcvbr Qvovi nvi KZ?
K) 5,000 - 10,000iU/†nt
L) 5,000 - 30,000iU/†nt
M) 10,000 - 50,000iU/†nt
N) 20,000 - 70,000iU/†nt

- 5| ersj vt`k iPsiwi cãvbZ tKvb&ai†bi Pvl nt`Q?
K) mbvZb c×iZ†Z
L) nvj Kv iwieo c×iZ†Z
M) Avav iwieo c×iZ†Z
N) iwieo c×iZ†Z

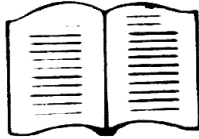
cW 5.3 յՍԽՈ ՔՐԺԼԻ ֿԻԵ ԻԵՔԲ, ԵՄՄՎ Լ ՄԺՎ յՍԽՈԻ ՔՐԺԼ ԸՄՆԸ Լ Ե՛ԵՒԸԲՎ



G cW ԻԿԺԼ ԱՎԸԻԲ –

- յՍԽՈ ՔՐԺԼԻ ֿԻԵ ԻԵՔԲ ԿԻԺԸ ԸՎԻԵԲ|
- ԵՄՄՎ յՍԽՈԻ ՔՐԺԼ ԸՄՆԸ Լ Ե՛ԵՒԸԲՎ ԵԿԵՎ ԿԻԺԸ ԸՎԻԵԲ|
- ՄԺՎ յՍԽՈԻ ՔՐԺԼ ԸՄՆԸ Լ Ե՛ԵՒԸԲՎ ՄԱՍՒԿՔԵՒԼՎ ԿԻԺԸ ԸՎԻԵԲ|

յՍԽՈ ՔՐԺԼԻ ֿԻԵ ԻԵՔԲ



ԵՄՄՎ յՍԽՈ

DcKj xq Gj vKvi thLvth tRvqvi fivUvi cFve ֿՎԿ tmLvthB ԵՄՄՎ յՍԽՈԻ ՔՐԺԼԻ ֿԻԵ ԻԵՔԲ ԿԻՎ ՄԱԵ| ԵՄՄՎ յՍԽՈ ՔՐԺԼԻ ՐԲ՝ ԴԵՎՎ ԸՄԲԻ ԸԻՔՑ ՄԻԵԻՎՆ ԸՊՂՎՐԲ Ges mgԻ՛Ժ ֿԺԿԲ ՉՎ ԸՎԼ ՂՎ ՄԱԵ| ԸԿԺՅ ԵՎ ԼՎԳՎԻԻ ՐԲ՝ Gttj ԵՎ ԴՎ-ԱՎԿ ԳՄՍ ՄԵԺՔԳ ԲԻԺ | thme AA՛ԺԺ DԻՄ՛ԺԻ ԸՄԻԳՎԿ ԿԳ ֿՎԿ ԴՄՄԵ AA՛ԺԺ ԸԿԺՅ ՉՄԻԻ ԼԻՔ ԿԳ ՆԳ | ԸԿԺՅ ՉՄԻԻ ֿԻԵ ՄԳԺԺ ՆԴԺ ԸԿԺՅ ՉՄԻԻ ԼԻՔ ԿԳ ՆԳ | ԴՄՐԲ՝ ԲԻԳԻ ԵՍԺԺԻ Դ՛ԼՎ ԸՊՂՎՐԲ | ՐԺԻՎ՛ՕՎԴՄԻ ԵՎ ՄԳԻ՛ ՏՏՈԻ ԱՎԼ ՉԻԳ ԸԿԺՅ ԸՏՈ ՍԿ ԲՎ ՉՎԼ Դ՛ԼԼ ԴԲԺԸ ՆԵ | ԴԻՄԴԻՄԻ Լ ՄԵ՛ԻՄԻ Ե՛ԵՒՎ ֿՎԿԺԸ ՆԵ |

ԵՄՄՎ յՍԽՈ ՔՐԺԼԻ ՐԲ՝
ԴԵՎՎ ԸՄԲԻ ԸԻՔՑ
ՄԻԵԻՎՆ ԸՊՂՎՐԲ Ges
mgԻ՛Ժ ֿԺԿԲ ՉՎ ԸՎԼ ՂՎ
ՄԱԵ |

ՄԺՎ յՍԽՈ

thLvth ԸԿԺՅ ԵՎ ԼՎԳՎԻ ԴԳՔՎ ԿԻԵ ԴՄ ֿՎԻԲԻ ԳՄՍԻ ԸՄԲ ԱԴԻ ԻՎԼՎԻ ՊԺԳԺՎ ֿՎԿԺԸ ՆԵ | ԳԻ ՐԲ՝ Gttj Լ ԴՎ-ԱՎԿ ԳՄՍ ՄԵԺՔՎԳ | ԸՊՂՎՐԲԻԳ ԸՄԲ ՄԻԵԻՎՆ ԿԻՎԻ ԵԴ՛ՎԵ ֿՎԿԺԸ ՆԵ | ԵԲՎԻ ԳԻՅ ԳԺՎԿՎ ՆԺԸ ՆԵ | ՕՐՎԳԳԻՅ ֿԻԵ ՆԺԸ ՆԵ | ԴԻՄԴԻՄԻՄԻ ՄԻՅԵՎ ֿՎԿԺԸ ՆԵ |

ԵՄՄՎ յՍԽՈԻ ՔՐԺԼ Լ Ե՛ԵՒԸԲՎ

ֿԻԵ ԻԵՔԲԻ ԿՎՐ ՄԱՍՒԸՆԴԺ ԸԿԺՅ ԼԲԲ ԻԻԿԻԺԸ ՆԵ | ԵՄՄՎ յՍԽՈԻ ԸԿԺԻ Լ ՄԲԻ ՉՎ ԿԻԺԸ ՆԵ 1.0-1.5 ԴԳՍՎԻ | ԸԿԺԻ Լ ԱՎԿՆԱՅ ԱՎԳԺՎԿԻ ՆԴԺ Ե՛ԵՒԸԲՎԻ ՄԻՅԵՎ ՆԳ | ԸԿԺԻ ԱՎԳԺԲ ԳԿ ԵՎ ԳԿՄԿ ԴՆԻ ՆԺԸ ԸՎԻ | ԸՍԽՍ ԸԿԺԻ ԸՄԲ ՄԿՎԻ Լ ԴԵԻ ՆԼՂՎԻ ՐԲ՝ ԱՅՄ ԴՄՍ ֿՎԿԺԸ ՆԵ | ԸԿԺԻ ԵՎԻ Ի՛Օ ԸԲԵՆԺԸ ՆԵ ԻՄԺԸ ՄՆԴՐ ԴՐՎՂՎԻԻ ԸՄԲ ԵՎ ԵՊՈԻ ԸՄԲԺԸ ԸՄԵԸ ԲՎ ՆԺԸ ԸՎԻ |

ԵՄՄՎ յՍԽՈԻ ԸԿԺԻ Լ
ՄԲԻ ՉՎ ԿԻԺԸ ՆԵ 1.0-
1.5 ԴԳՍՎԻ |

ԸԿԺԻ Լ ՉԺԳ ԻՄԺԸ ԴԿՎ ՄԻՒՕԻ ֿՄՈ ԲՎ ֿՎԿ ՉՎԻ Ե՛ԵՒՎ ԿԻԺԸ ՆԵ | ԸԿԺԻ Լ ՉԺԳ ԴԿՍԻԿ ԲԻԵ ԳԿՍՍ ԲԻԺՎ ՉՄԻ ԿԻԺԸ ՆԵ | ԲԻԺՎՍ ԸԿԺԻ ԸՄԲ ԴԵԻ ՆԼՂՎԻ ԱՅՄ ԴՄՍԻ ՄԻՒՒ ՄՏԻՅՅ ֿՎԿԵ | ԸԿԺՅ ՉՄԻԻ ՄԳԳ ԸՄԲԺԸ ԵՎ ՉԻՄ Դ՛ՂՎԻ Ges ԸՄԲ ՍՕՍԻՎԻ Ե՛ԵՒՎ ԻՎԼԺԸ ՆԵ |

ԸԿԺՅ ԼԲԻԲԻ ԿՎՐ ՄԱՍՒԸՆԼՂՎԻ ԸԻ ԴԸՎՎ ՕՐՈՎԻ ՐԲ՝ ԸԿԺՅ Ը՛Չ ԿԻԺԸ ՆԵ | ԸՍԺԳ ԸԿԺԻ ՄՎԻ ՍԻ-1 ԱԲԻՎԻՒՒ ՔԵ ԸՊՂՎՄ ԿԻԺԸ ՆԵ |

mvi wY 1 t guli ucGBP Ablyqx Pz c0qutMi cwi gvY |

guli ucGBP	c0Z kZistk Pbi cwi gvY (tKuR)
4.0	11.0
5.0	7.0
6.0	3.5
7.0	c0qvRb tbB

Pz cKzi cmb t`qvi AvtM ev cti e`enri Kiv thtZ cvti | Pz c0qum m`ubentj mvi wY-2 Ablyqx mvi c0qum KitZ nte |

mvi wY 2 t weifbamvti i c0qum gvIv |

mfi i bug	mfi i cwi gvY (tKuR/tnt)
gyMi weov A_ev tMvei	250 - 270
BDwi qv	50.0
u.Gm.uc	50.0

mvi t`qv m`ubentj cKzi i cmbi MfxiZv 1.0 - 1.5 wUvti DbwZ KitZ nte | `B t`k wZb mBvti ni wfZi cKzi i cmbi is meR ntq DVte | ZLb nij Kv ubneo Pvl cxwZi Rb` c0Z tnzti 15,000 - 30,000 uU tcvbv, Avav ubneo Prtli Rb` 30,000 - 50,000 uU tcvbv Ges ubneo Prtli Rb` 2,80,000 uU tcvbv QvotZ nte | tcvbri Avktaqi Rb` duk duk Kti c0Z tnzti 4-6 uU bwi tKtj i Wlv cKzi i Zj vq tdj tZ nte |

evM`v uPsvio Prtli Rb` cmbi e`e`vcbv LyB iZcy` nij Kv ubneo Prtli tejvq c0Z Agvem`v I cwy`vq tRvqtii mgq cKzi i cmbi 40-50% tRvqtii cmbi 0viv e`j Kti w`tZ nte | Avav ubneo Prtli tejvq c0Zw`b cKzi i cmbi 30-40% tjvrb cmbi 0viv e`j Kti w`tZ nte |

ZvQrov Avav ubneo Prtli tejvq c0Z w`b 18 - 20 NvUv mgq cKzi i cmbtZ evZvm t`qvi e`e`v KitZ nte | evZvm t`qvi hS;0viv G KvrwU Kiv m`e | cKzi cmbi uQvrtZ nte |

nij Kv I Avav ubneo Prtli tejvq w`bqvZ mvi e`enri Kti cmbi `0Zv 25 - 40 tmt wgt ivLtZ nte |

c0Zw`b uPsvio tK 3-6 evi m`u`i-K Lv` w`tZ nte | Lv` mieivn Kivi Rb` tu`e`enri Kiv thtZ cvti | KLbl thb Lv` Awak cwi gvY bv t`qv nq | Lv` tewk ntj cmbi b0 ntq hvq Ges GtZ cmbi `w`tZ ntq uPsvio gviv hvq | uPsvioi m`u`i-K Lv` mvi wY-3 Ablyqx `Zwi Kiv thtZ cvti |

Kul.1 cji Dbqbb`z

mviwY 3 t wPswoi m=úí-K Lv` Zwi i Dcv`vb I cwi gvY|

DcKiYi big	cwi gvY (%)
Mtgi fwl	15
Ptji i wgnKgn	25
wdkwgj	40
AvUv	15
%j (mqweb ev mvi Iv)	5
tgU	100

Gfite e`e`lcbv Kitj RjvB gvpmi wFzi cZwU wPswoi Mo IRb`wvq 50-60 Mtg| mvariYZ Agvem`v ev cwiYvi úRyGi mgq cKz ev Lvgvi ntZ wPswoi aiv nq| RjvB gvpmi gvSvgnS wPswoi aiv tkl nq|



Ablyj b (Activity) t aly, Avcbvi cZteKx Rbve kvnRvjvj mvtntei GKwU eo AvKvti i wPswoi Lvgvi AvfQ Ges Avcbv H Lvgvti i GKRb grm` KgRZPwntmte KgPZ| H Lvgvti i Rb` Dcfr³ DcKiY, tjr w`tq 500 tKwR wPswoi Lveri`Zwi Kivi Rb` tKvbu Kx cwi gvY e`envi Kiteb Zvi GKwU mviwY`Zwi Kily|

Mj`v wPswoi Pvl I e`e`lcbv

Mj`v wPswoi cKzi i AvKvi 0.5-5.0 tn±i ntZ cvti | cKzi i Mfvi Zv`vKtZ nte 1.0-1.5 wglvi | cmbi jeYv³Zvi cQvRb 0.4 wciwU (Parts per thousand) | cKzi i cvo Ggb Dben³ nte hifZ ep ev eb`vi cmbtZ cmeZ bv nq|

cjvZb cKzi Pvl KitZ ntj cUtg we`gub Dm`c, gvQ I tcvKv-gvKo mivtZ nte| cKz i`wKtq ev Jla ev KxUbvkK e`envi Kti G KvrwU Kiv thtZ cvti | Gici gwUj wGBP t`tL Pz cQvM KitZ nte Ges mviwY-4 Ablyti Pz cQvM KitZ nte|

mviwY 4 t gwUj wGBP Ablyqx Pz cQvM gvT v|

gwUj wGBP	Pzbi cwi gvY (tKwR/kZisk)
4.0	8 - 15
5.0	4.5 - 3.5
6.0	2.0 - 2.5
7.0	1

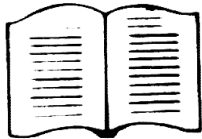
Pz cwb t`qvi AvfM ev cti cQvM Kiv thtZ cvti | Pz cQvM ci mviwY-5 Ablyqx mvi e`envi KitZ nte|

mviwY 5 t Pz cQvM ci wefbanvti i cQvM gvT v|

mvti i big	cwi gvY
------------	---------

	(tKvR/tn±i)
gyMi weov ev tMvei	300
BDwi qv	25
uJ.Gm.uC	12
cUvk	5

mvi e`envtii ci cmbi Mfxi Zv 1.0 - 1.5 ugUvi Ki±Z nte| mvi e`envtii 2-3 mBvtni gvtS cKzi i cwb meR eYp nte| G mgq cwb i ^QZv `wvte 25-35 tm. ug. | G Ae`vq GKK Prli Rb` cKZ tn±ti 10,000 - 50,000 uJ Mj`v uPsvoi tcvbri QvotZ nte| tcvbri Avk±qi Rb` bwi±Ktji WMv e`envi Kiv th±Z cvti | ugk±Prli Rb` Ab`vb` gvtQi tcvbri mvt_ cKZ tn±ti 8,000 - 10,000 uJ tcvbri Qvov th±Z cvti | uSbtKi gvsm, kvgtKi gvsm, tQvU gvQ, gvtQi uMg, tKtPr, giv uPsvio BZ`w` uPsvio Lv` unmtte e`envi Kiv hvq| ZvQvov evM`v uPsvio Rb` th m±uik Lv` e`envi Kiv nq (AvfMB ejv ntqtQ) ZvI Mj`v uPsvio Rb` e`envi Kiv Ptj | btf±t - tdeyvi x wfZi uPsvio aiv nq| G mgq Mto cKZu uPsvio I Rb` wvq 40 - 60 Mg|



mvi gg±t DcKj xq Gj vKvq tRvqvixq AAtj evM`v uPsvio cKz ev Lvgi uBgPv Ki±Z nq| GtWj I t`v-Avk gvU cKzi i Rb` DEg| Rtjv`Qvm ev mgy±Sto hv±Z cKzi i qWZ bv Kti tmv±K j q` ivL±Z nte| cKzi cwb XKv I tei nlqvi e`e`v ivL±Z nte| tcvbri Qvovi AvfM gyMi weov/tMvei, BDwi qv, uJ.Gm.uC. mvi e`envi Ki±Z nte| GtWj I t`v-Avk gvU cKz Mj`v uPsvio Rb` DcthvMx| Prli Rb` cwb mieiv AZ`vek`K| cwb i jeYv³Zv ivL±Z nte 0.4 uCvU| cjuZb cKzi i tqt±t we`gvb AvMvQv I cOYx`i Ki±Z nte| uSbtKi I kvgtKi gvsm, tQvU gvQ, tKtPr, gvtQi uMg, uPsvio Lv` unmtte e`envi Kiv hvq| btf±t - tdeyvi x gv±mi wfZi uPsvio ai±Z nq|



cuVvĚi gj'iqb 5.3

mĚK DĚti i cuK ĚK ĚPý (✓) ě b|

- 1/ eM`v ě Mj`v ě Pšioi cĵzi i Rb` tKĭb&tKĭb&gMĭ Fĭj ?
K) tetj, ewj
L) Gĭĭj, t`uAĭk
M) AbġP, tetj
N) A=0I Kĭ`v

- 2/ eM`v ě Pšioi cĵzi i Mfxi Zĭ KZ ě vLĭZ nĕ?
K) 0.5 - 0.75 ěgUĭi
L) 1.0 - 1.5 ěgUĭi
M) 2.0 - 2.5 ěgUĭi
N) 2.5 - 3.0 ěgUĭi

- 3/ eM`v ě Pšioi cĵzi i cĭbi j eYr³Zĭ KZ ě vLĭ DĚg?
K) 10 - 15 ěĭĭĭĭU
L) 15 - 20 ěĭĭĭĭU
M) 15 - 25 ěĭĭĭĭU
N) 25 - 30 ěĭĭĭĭU

- 4/ Mj`v ě Pšioi cĵzi i gMĭi ě GBP 6 nĭj Kx nĭti Pĭ e`envi KĭtZ nq?
K) 1.5 - 2.0 tKĭR/kZĭsk
L) 2.0 - 2.5 tKĭR/kZĭsk
M) 2.5 - 3.0 tKĭR/kZĭsk
N) 3.0 - 3.5 tKĭR/kZĭsk

- 5/ Mj`v ě Pšioi GKK Pĭĭi i Rb` Kx nĭti tĭvĭv QvotZ nq?
K) 10,000 - 20,000/ĭnt
L) 10,000 - 30,000/ĭnt
M) 10,000 - 40,000/ĭnt
N) 10,000 - 50,000/ĭnt

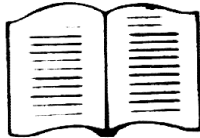
cW 5.4 **¶Pswi AvniY mgq, AvsikK AvniY, m=úY@AvniYKtj j ¶Yiq veiq**



G cW tkli AvciB -

- ¶Pswi AvniYi mgq m=úY@RvtZ cvi teb|
- ¶Pswi AvniYi c×wZ eYv KiZ cvi teb|
- ¶Pswi AvniYi mgq Kx Kx mvearbZv Aej =b KiZ nte Zv Dvj - L KiZ cvi teb|

¶Pswi AvniY mgq



Mj`v ¶Pswi btf= Ges tdeyix gvmti wFzi aiv nq| Ab`w tK evM`v ¶Pswi aiv iinyq tg gvmti tkli w`tK Ges aiv tkl nq RjvB gvmti gvSvwmS| A_¶Pswi I Rb hLb Mto 30 Mlg ev Zvi Dcti tctiO ZLb ¶Pswi aiv nq|

¶Pswi AvniY c×wZ

AviskK AvniY

¶Pswi hLb 30 Mlg ev Zvi tPtq teik I Rtbi nq ZLb ¶Pswi aiv iinyq| ¶Pswi aivi mgq `w| wbgq AbyiY Kiv thtZ cvi | h_v AviskK AvniY Ges m=úY@AvniY|

eo ¶Pswi ati Zvt`i `tj Avevi tQvU ¶Pswi cKzi Qvov nq| G ai#bi AvniY c×wZtK wei vgnib ev Continuous c×wZ ej v nq|

AviskK AvniYi mgq eo eo ¶Pswi ,tj vtK cLg aiv nq Ges tQvU ,tj vtK cti aiv nq| ZvQvov eo ¶Pswi ati Zvt`i `tj Avevi tQvU ¶Pswi cKzi Qvov nq| G ai#bi AvniY c×wZtK wei vgnib ev Continuous c×wZ ej v nq|

Avevi AtbK t¶¶t cKz, avb t¶¶Z, ev tNi t`tK cLg ¶Pswi aiv nq Zvici az ¶Pswi ntZ eo ¶Pswi ,tj vtK ti tL tQvU ,tj vtK Rj vktq tQto t`qv nq|

AviskK AvniY c×wZtZ Drcw`Z ¶Pswi GKwU Ask (eo) Aí mgqi wFzi wev iiyKiv hvq| GtZ tQvU ¶Pswi ,tj v eo nl qvi Rb` teik Lv` ,`vb I mgq crq| ZvQvov B`Qv Ktj GKwU wv`@ AvKvti cLg me ,tj v ¶PswotK eo Kiv hvq| Zte AviskK AvniY wKQy wKQy ¶Pswi AvNvZ cvl qvi dtj ev tLij m e`tj i KviY gviv thtZ cvi ev ti wMv wš nTz cvi | GtZ Drcv`b wKQy nwm tctZ cvi | ZvQvov AviskK AvniY c×wZtZ ¶Pswi UvKv GK mvt_ Pvlxi nvtZ Avtmbv| eis `xN`mgq ati Pvlxi nvtZ Avtm| Gi dtj Pvlxi gj-ab `Zwi nl qvi mthvM Ktg hvq|

m=úY@AvniY

m=úY@AvniYi tejvq hLb ¶Pswi aivi mgq nq ZLb tQvU eo me ¶PswotK GK mvt_ aiv nq| Rj vktq tKvb ¶PswiB ivLv nq bv| G ai#bi AvniY ¶Pswi AvKvi bvbv ai#bi `vtK| dtj me ,tj v ¶Pswi tMw GK nq bv| G c×wZtZ ¶Pswi ,tj vtK `xN` b Rj vktq ivLtz nq| Gidjtj AtbK ¶Pswi gviv cto Ges tQvU ¶Pswi ,tj v Lv` Mh`Yi cLZthvM Zvq ev eot`i ÚAe`vbMZ PvtcÚ mntR eo ntZ cvi bv| ZvQvov ¶Pswi th AskwU AvKvti tQvU `vtK Zvt`i evRvi `iI Kg `vtK| m=úY@AvniY tLij m e`j big ¶Pswi ,tj vtK I ati tdjtZ nq| G ,tj vi I evRvi `i Kg|

m=úY@AvniY c×wZtZ me ,tj v ¶Pswi GK mvt_ ati GK mvt_ wev iiy Kiv nq etj Pvlxi gj-ab mwó nl qvi mthvM teik `vtK| ZvQvov GK mvt_ Rj vkq Lvij nq etj cieZ`Pvtli Rb`

Kul. I cj Dbaqb ˘z

RjvkaþK mgqGZ ˘Zwi Kiv hvq| m˘uY AvniY c˘wZ AbniY Kitj cKz ev Rjvka, tjvþK i Kvþb hvq Ges tmB mt_ cKzi i cDr Kv`v miþbvmm Ab`vb` cDqvRbxq ms`wigj-K KvR Kiv hvq| cKz i Kitj wPsioi Drcv`b AþbK evto Ges cKz `xN@ b Fij Ae`vq _vþK|

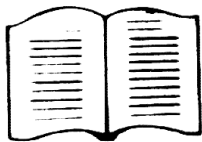
wPsioi AvniY cDuv

du ev t`vmbv, SmK Rvj I cwb i wKtq Rjvka nþZ wPsioi aiv ev AvniY Kiv thþZ cvi | wPsioi hLb eo nq ZLb Rjvka t_þK tei nþq Pþj thþZ tPov Kþi | Gmgq wPsioi tmþZi weciX w`þK Pþj | wPsioi G `fveþK KvþR j wMþbvi Rb` tRvqvþi cwb cKzi XKvþb nq | G mgq uþm du j wMþbvi _vþK | wPsioi cDekKZ.tRvqvþi cwb weciX w`þK Pþj du cDek Kþi | du t_þK cþi wPsioi msMh Kiv nq |

SmK Rvj w`tq `fite wPsioi AvniY Kiv thþZ cvi | cDgZt cKzi mi vmi Rvj tgþi wPsioi AvniY | wZxqZt tRvqvþi cwb XwKtq uþmi du `Zwi cKzi cDtg wPsioi Rgvþb Zvici cKzi i cwb Kvgþ cKzi i Rgv wPsioi mnþRB SmK Rvj w`tq AvniY hvq | cKzi i, tNþi ev aiv tþþZi cwb i wKtq AwZ mnþR wPsioi aiv hvq | G c˘wZþZ 100% wPsioi AvniY m˘e nq, hw` Rjvka Lg tewk eo nq Ges Rjvkaþi Zjv wþPz _vþK Zvntj cwb wþk kb KiþZ AþbK LiP cto | tKvb tKvb tþþi cwb wþk kb e`q Am˘e nq |

AvniY Kvþj j þYvq wlv

wPsioi AvniþYi mgq wPsioi AvKvþi w`þK `w` ivLþZ nþe | KviY eo AvKvþi wPsioi `vg tQvU AvKvþi wPsioi Zþbvq AþbK tewk | m` tLvj m e`j KZ.big wPsioi `vg AþbK Kg _vþK | tmRb` G Ae`vq wPsioi aiþZ tbB | AvsmK AvniþYi mgq tQvU wPsioi, tjv I tLvj m e`j KZ.wPsioi, tjv hvþZ AvNvZ cDþ nþq ev Ab` tKvb fite þwZ M`bv nq tmw`þK j þ` ivLþZ nþe | evRvi `i t`þL wPsioi aiþZ nþe Ges evRvi RvZKiY I msi þYvq w`K, tjv wþwDZ nþq wPsioi AvniY KiþZ nþe |



mwigg Mj `v wPsioi bþf˘ gvm nþZ tdisgvix gvþmi wFzi AvniY Kiv nq | evM`v wPsioi AvniY Kiv i iynq tgD tkþi w`þK Ges tkþ nq RjvþB gvþmi gvSvgnS | wPsioi Mo I Rb hLb 30 Mþg tcdþ Q ZLbB wPsioi AvniY i iynq | AvsmK fite ev m˘uY fite wPsioi AvniY Kiv nq | AvsmK AvniþYi tejvq eo wPsioi, tjv þK i ayAvniY Kiv nq | G aiþYi AvniþK weivgnxb AvniY ejv nq | m˘uY AvniþYi tejvq me, tjv wPsiotþK GK mt_ aiv nq | weivgnxb AvniþYi tejvq Pvli gi-ab `Zwi i mþhM Kg _vþK | m˘uY AvniþYi tejvq Pvli gi-ab `Zwi i mþhM tewk _vþK | du, SmKRvj I cwb i wKtq Rjvka nþZ wPsioi aiv thþZ cvi | Rjvka i wKtq wPsioi aiþZ cviþj GK w`þK thgb 100% wPsioi aiv m˘e nq Ab` w`þK cKz i wKtq | ms`vi Kþi Drcv`b evovþb thþZ cvi | wPsioi AvKvi, evRvi `vg, evRvi RvZKiY, msi þY BZ`w`i w`þK j þ` tiþL wPsioi AvniY KiþZ nþe | tQvU I tLvj m e`j KZ.wPsioi, tjv þK AvniY Kvþj þwZM` Kiv hvte bv |



cu#VvEi gj`iqb 5.4

m#K DEti i cu#k #K #Py (✓) # b|

- 1| Mj`v #P#o Avni#Yi mgq KLb?
 - K) Rj#B - AvM÷
 - L) AvMó - #m#P#f
 - M) #m#P#f - Rvbsvix
 - N) b#f#f - tdi#vix

- 2| e#M`v #P#o #Kv&gv#m aiv`i yq Ges #Kv&gv#m tkl nq?
 - K) #W#m#f - Rvbsvix
 - L) Rvbsvix - gvP©
 - M) tg - Rj#B
 - N) tg - AvM÷

- 3| #P#o Avni#Yi c#Z Kq#U?
 - K) 1
 - L) 2
 - M) 3
 - N) 4

- 4| #Kv c#Z#Z me #P#o GK m#_ aiv nq?
 - K) m#úY#Avni Y c#Z#Z
 - L) Avs#K Avni Y c#Z#Z
 - M) me ai#Yi c#Z#Z
 - N) #ei vgn#b c#Z#Z

- 5| Avs#K Avni#Yi tejvq #Kv&AvKv#i i #P#o ,#jv aiv nq?
 - K) #Q#U AvKv#i i
 - L) eo AvKv#i i
 - M) me AvKv#i i
 - N) #c#v#v AvKv#i i

eĕenwiK

cW 5.5 Mj `v I eM`v iPsiD kbr³KiY

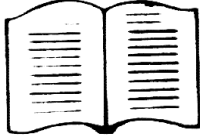


G cW ĩktI AvciD –

- Mj `v iPsiD i %enkó Dĵ LceR kbr³ Kiĵ cviĵeb|
- eM`v iPsiD i %enkó Dĵ LceR kbr³ Kiĵ cviĵeb|

DcKiY

Rij , evj uZ, di gwj b, tgmmbdiBs Mm, tU^o, mrvh`Kvi x eB|



cĕmwiK Z_

Mj `v iPsiD (Macrobrachium rosenbergii)

- | | |
|---------------|---|
| me@pr - | cjy iPsiD - 320 ugwj uGUvi |
| | ĳ iPsiD - 250 ugwj uGUvi |
| is - | nij Kv bxj A_ev nij Kv meR |
| D`i -tLvj m - | D`i I tLvj m thLvĵb uqĵktQ tmLvĵb (msthvM`ĵj) bxj eUbx_vĵK |
| cv - | 2q Pj b c`eo I iPgUvhĳ_vĵK |
| KivZ/i ÷tg - | KivZi Dcwi fvĵM 11-14uU `vZ_vĵK mbĵPi Astk_vĵK 8-14uU |
| | KivZi gv_v abĵKi gZ tetK Dcĵi DĵV hvq |
| `vM - | uQĵbi w`ĵK tMj ĵKi ugwj Z `vĵb mbĵPi w`ĵK 3-4 uU nj ž `vM_vĵK |

KivZi gv_v tetK hvl qv
 Ges uQĵbi njy `vM
 kbr³Kiĵi metPĵq mnR
 Dcvq|



metKl j ĳYxq

KivZi gv_v tetK hvl qv Ges uQĵbi njy `vM kbr³Kiĵi metPĵq mnR Dcvq| (iPĴ-48)



iPĴ 48 t Mj `v iPsiD

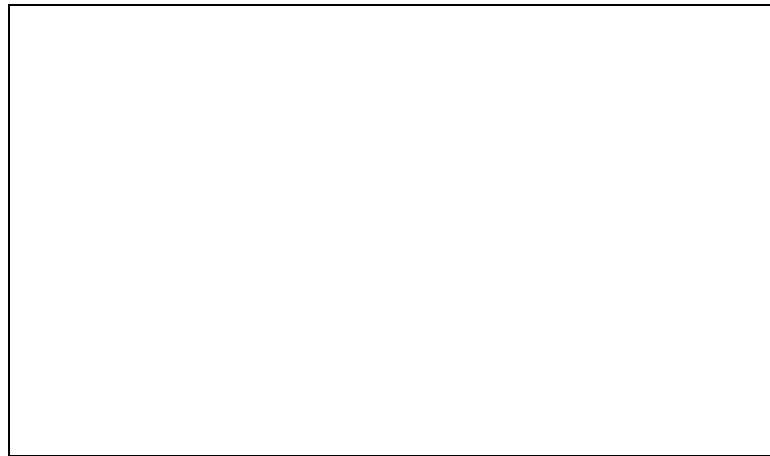
evM`v vPswO (Penaeus monodon)

- me@pr - cjlj 298 ugij guUvi
`x 336 ugij ugUvi
- is - nij Kv meR
- tWviv - evfNi Mtqi tWvivi gZ Kvj tP i tOi tWviv KvUv `vM_vtK|
- cv - BDtvc tW bxj e tYp` tWviv KvUv `vM_vtK|
- D`i - D`i AA t j i mbP w tK I cvtq nj t` I j vj ugkv t b v tWviv `vM_vtK|
- tUj mb (tj R) - cvtki KvUv tbB|

evfNi Mtqi tWvivi gZ
Kvj tP i tOi tWviv KvUv
`vM_vtK|

mekl j tYiq

evfNi gZ tWviv KvUv `vM_vtK| GRb` Gi bvg Giant tiger shrimp (vP^T-49)|



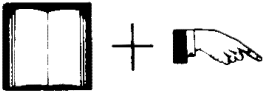
vP^T 49 t evM`v vPswO

Kih@Vj x

Rij 0vi v vPswO a ti XvKbv I qj v evj wZ tZ 5% di g m j b 0vi v msi tY Ki tZ nte| Mtel YvMvi
Kv tQ n t j msi tY i c0qvRb tbB|

Mtel YvMv t i vPswO t j v tK Ab`vb` gvQ ev KxUcZ 1/2 n tZ Avj`v Ki tZ nte| Gici wKQv
Av`v tRi I ci cRmZ w f w EK vPswO t j v tK Avj v`v Ki tZ nte| Gici eBtqi eY0vi mvt_
ugij t q Mj`v I evM`v vPswO t j v tK kbr`3 Kib Ges e`enwv K LvZiq Kih@Vj x mn Qie GtK
wDUi tK t`wL t q` tY i wbb|

cW 5.6 Mj`v I eM`v uPswi tiYkbr³KiY

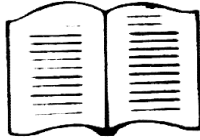


G cW tkłI Avciłb –

- Mj`v uPswi tiYkbr³ KiłZ cviłeb|
- eM`v uPswi tiYkbr³ KiłZ cviłeb|

DcKiY

Rij, _uj, tgmłbdiBs Mm, digwj b, I qvP Mm, úvBW, Rvi, mrvnh`Kvi x eB|



cłmłK Z_

Mj`v uPswi tiYkbr³KiY

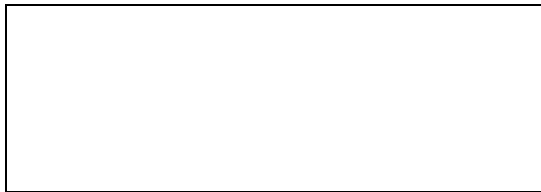
- wki etłI tLij tm j włK tqKw ti Lv _vłK|
- jvfł AvKvi eo ntj D`i LÚłKi młhM`łj bxj etłP tWivKvUv `vM ł Lv hvq (uPł-50)|



uPł 50 t Mj`v uPswi tiYy

eM`v uPswi tiYkbr³KiY

- ł`łni łcłUi włK AvMłMvov Uvbr GKw j vj łP ev ev`vgx `vM _vłK|
- D`łi i włP łk 14-19 w j vj łP ev`vgx łclUv łclUv `vM _vłK|
- RweZ łcłv gv_ v 45% włPi włK tiłLI łj R Dcłi tiłL mvZvi KłU (uPł-51)|



uPł 51 t eM`v uPswi tiYy

Kihelvj x

Rij łviv uPswi łcłv młMł Kłi GKw Rvłi ivLłZ nłe Ges 5% digwj b łviv msi łłY KiłZ nłe| hwł MłelYvMvi młMłni `łbi KłQ _vłK Zv ntj msi łłYi cłqvRb łbB| hviv łcłv atł Zv`i łK włł młMłni KvRw Kivłbv thłZ cvłi| A_ev łcłv włP Zv`i KvQ ł`łK łcłv μq Kłi młMł Kiv thłZ cvłi|

łcłv, łjv MłelYvMłi Głb Avj`v Kij Ges tgmłbdiBs Młłmi włZi włł cłZw łcłv cixłł Kłi Zv łłL Mj`v I eM`v uPswi łcłv kbr³ Kij Ges e`enwł K LvZvq Qwe GłK wDUiłK ł`łłłł ħ|



Povšigj`iqb

msuŋB I iPbvj-K ckae

- 1| evsj v`k tKvb&M#Yi tenk cRvNZ ue`gib| MY, tj vi bvg wj Lj|
- 2| tjvbr cmb I `f`ycmbi MY, tj vi bvg Avj v`v Avj v`v fite wj Lj|
- 3| evsj v`k ki Pvl thvM` cRvNZ, tj vi bvg wj Lj|
- 4| 10wU wPswoi evsj v bvg I `eÁmbK bvg wj Lj|
- 5| tNti wPswoi Pvl i c×wZ eYŋv Kij|
- 6| avb tŋtzi wPswoi Pvl c×wZ eYŋv Kij|
- 7| mbvZb c×wZtZ Pvl Kxfite Kiv nq Zv wj Lj|
- 8| Avav wbowo Pvl Kxfite Kiv nq Zv Dŋj - L Kij|
- 9| wbowo Pvl Kxfite Kiv nq Zv wj Lj|
- 10| Mj `v wPswoi Pvl cŋvj x eYŋv Kij|
- 11| evM`v wPswoi Pvl cŋvj x eYŋv Kij|
- 12| wPswoi cŋzi i `vb wbeŋt b tKvb&tKvb&wel q t`LtZ nte Zv wj Lj|
- 13| wPswoi aivi wμqv, tj v eYŋv Kij|
- 14| Rjvkq i`Ktq wPswoi ai tj Kx Kx DcKvi nq Zv eYŋv Kij|
- 15| tKvb w`K, tj v j ŋ` ti tL wPswoi Avni Y Ki tZ nte Zv wj Lj|
- 16| AvsikK I m=úY@Avni Y c×wZi mjeav I Amjeav, tj v eYŋv Kij|



DĚigjv

cW 5.1

1| N 2| N 3| M 4| M 5| N

cW 5.2

1| M 2| L 3| M 4| M 5| K

cW 5.3

1| L 2| L 3| M 4| L 5| N

cW 5.4

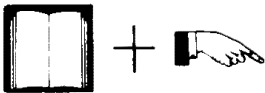
1| N 2| M 3| L 4| K 5| L

BDibU 6 RjR Dirmc I KxU cZ½

RjR Dirmc I KxUcZ½ cKzi i gvtQi Rb` thgb c0qurB AvtQ tZgub Gt` i Awak Drcri b gvtQi Rb` qWZKi I ntZ cvti | tkIjv cKzi i gvtQi Lv` uKs` Gt` i cwi gvY teuk ntq eg ntj gvtQi Rb` qWZKi ntZ cvti | cKzi i RjR Dirmc` i gvtS j Zvtbv, fimgvb, ubMg bkij, I Wzsl Dirmc` i bvg wetkl fite Djj LthvM | Gt` i cwi gvY teuk ntj cKzi gvtQi Drcri b Ktg hvq Ges gvtQi qWZ nq | newfbecxwZtZ qWZKi Dirmc` `gb mae | thgb - hmsK, i vmqubK I Rmek Dcrfq cKzi i qWZKi Dirmc` `gb mae | newfbrai tbi KxU gvtQi qWZ Kti | AtbK i vmqubK `e` 0v i v KxU `gb mae | RjR AvMvQv 0v i v Kt auv ÷ mvi `Zwi Kti cKzi mvi wmwte e`envi Kiv hvq |

G BDibU RjR Dirmc` i cKvi t f` I c0qurBxqZv, RjR AvMvQv I qWZKi KxUcZ½ `gb I ubqšy, cwb tZ tkIjvi eg I Dvri ubqšy, AvMvQvi mrvrth` Kt auv ÷ mvi `Zwi I e`envi, RjR AvMvQv I qWZKi KxUcZ½ mSMb I kbr³KiY Ges Kt auv ÷ mvi cšZ m au t K® we`hvi Z Avtj vPbv Kiv ntqtQ |

cW 6.1 RjR Dirmc` i cKvi t f` I c0qurBxqZv



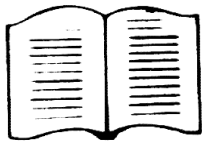
G cW tkI Avci b –

- RjR Dirmc` i cKvi t f` D`vni Ymn Avtj vPbv Ki tZ cvi teb |
- RjR Dirmc` i c0qurBxqZv e`vLv Ki tZ cvi teb |

RjR Dirmc` i cKvi t f`

cKzi i ev newfbrai tbi Rjvktqi Dirmc` KjtK c0vbZ `0fv tM f vM Kiv Ptj | h_v -

- tkIjv RvZxq ubaezi Dirmc` Ges
- dZavix D`Pzi Dirmc` |



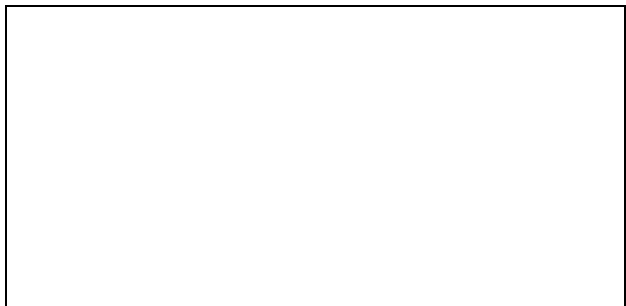
tkIjv RvZxq ubaezi Dirmc`

Gt` i tK t`n MVtbi I ci wfuE Kti ubae f v tM f vM Kiv hvq t

cv¼Ub RvZxq tkIjvi
 Awakisk Lwj tPv tL
 t`Lv hvq bv | Giv cwbi
 mvt_ GK`vb ntZ Ab`
 `v t b `v b v š h i Z nq |
 D`vni Y - Phacus,
 Pandorina BZ`w` |

cv¼Ub RvZxq tkIjv

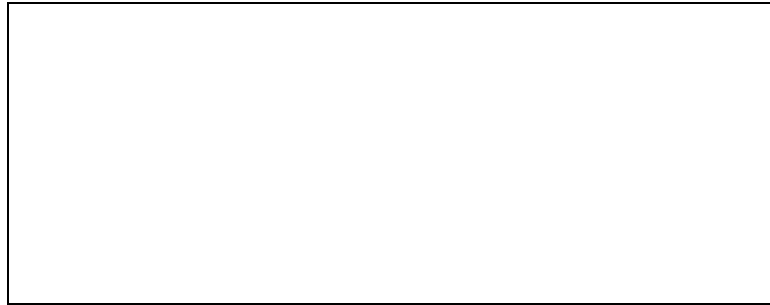
cv¼Ub RvZxq tkIjvi Awakisk Lwj tPv tL t`Lv hvq bv | Giv cwbi mvt_ GK`vb ntZ Ab`
 `v t b `v b v š h i Z nq | D`vni Y - Phacus, Pandorina BZ`w` (wP t -52) |



Kul. I cju Dbqbb`z

ZŠRvZxq tkIjv

G aiþbi tkIjv ZŠ`ev mÿvi gZ AþbK j`nq Ges cmbi wK ubtPB Giv Ae`vb Kti |
ex cmbtZ Giv tenk cmigtY Rtb#| Gt`i is Nb meR| D`vniY - Spirogyra,
Zygnema BZ`w`| Giv cÿzi cyo e`envi Kti tdj I mþhP Avtjv cÿzi cmbtZ
cletk erav t`q (wPÎ-53)|



wPÎ 53 t ZŠRvZxq tkIjv

wbgw%Z tkIjv t`Ltz
Dbz Dw`m`i gZ gtb
nq| Giv cmbi ubtP
gmUtz tj #M`vK Ges
t`n Dctii w`tK DfV|
cmbi th AAj mþhP
Avtjv cto tm AAj Giv
Rtb#|

wbgw%Z tkIjv

wbgw%Z tkIjv t`Ltz Dbz Dw`m`i gZ gtb nq| Giv cmbi ubtP gmUtz tj #M`vK Ges
t`n Dctii w`tK DfV| cmbi th AAj mþhP Avtjv cto tm AAj Giv Rtb#| D`vniY -
Chara, Nitella BZ`w`| Giv cÿzi cyo e`envi Kti tdj Ges mþhP Avtjv cÿzi
cmbtZ cletk erav t`q (wPÎ-54)|



wPÎ 54 t wbgw%Z tkIjv

djavixD`Pzi Dw`m`

Giv bvbv iKtgi ntZ cvti | Gt`i Rrebe#vššI I ci wfwE Kti ub`uj wLZ fite wfwRZ Kiv
hvq t

fungvb Dw`m`

Gaiþbi Dw`m` cmbi Dcti tf#m`vK Ges `j`eta Rtb#| Giv mþhP AvtjvK cmbi ubtP
cletk Kitz erav t`q| D`vniY - KPwi cvbv, Kul cvbv, ¶w` cvbv BZ`w` (wPÎ-55)|



KPni cibv

KuJ cibv

q|z cibv

uPÎ 55 t fvmgvb DvM`c

j Zvfbv DvM`c

Giv ukKo Øviv Rjvktqi cifo ev Kg cwbtZ tj tM _vtK | Gt`i t`n j Zvi gZ _vtK Ges
cvo t`tK Wlv cktzi i gvtSi w`tK tefo Ptj | Giv cktzi i cwbtXtK ivtL Ges mthP Avtjv
cktzi cotZ evav t`q | D`vniY- Kj ugj Zv, tntj Av BZ`w` | (uPÎ-56) |



uPÎ 56 t j Zvfbv DvM`c

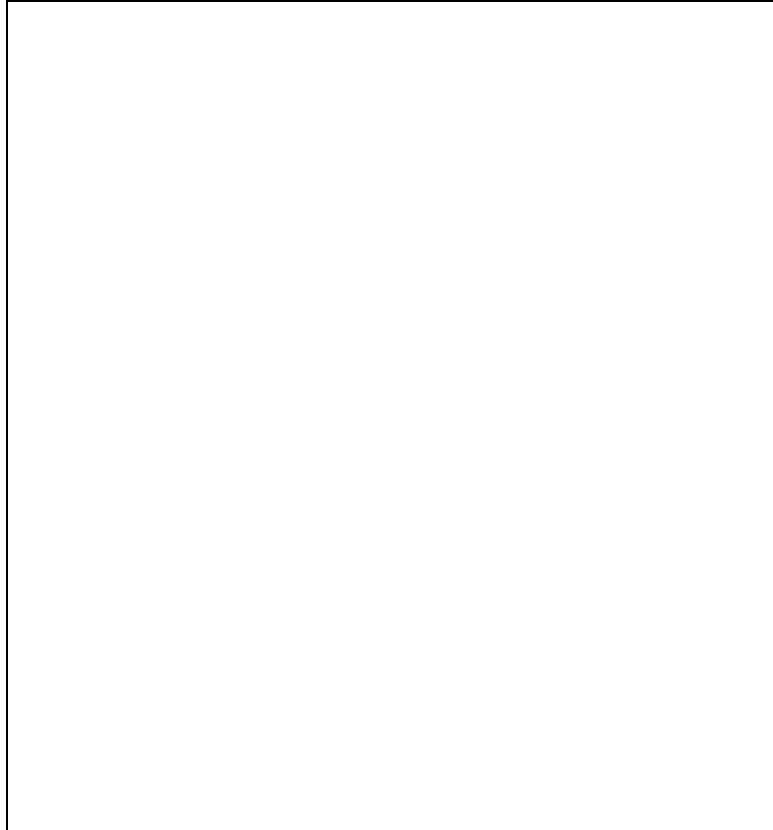
ubMgbyj DvM`c

G aiþbi DvM`c`i gj- Rjvktq Zj t`tki Kv`vi mvt_ mshP _vtK | Gt`i KvÛ, civZv Ges djz
cwbi Dcwi fvM fvM tZ _vtK | Giv mthP AvtjvtK cwbi ubtP cðek KitZ evav t`q |
D`vniY- weI KvUvj x, AvtjvtW BZ`w` |



gvtQi Pvl I e`e`vcbv

Kul. I cju Dbqob 7



1P1 57 t 1bM@bkj D11

Wz1D11

G ai1bi Rj R D11 c1bi Zj t1k Wz1Ae1q 1K| c1zi er Rj vktq G1 i A11K11
c1yi c1ig1Y K1g1q t1q 11eavq gv1Qi Drcv11b e11N1Z N1U| D11ni Y- c1Z1S11S, b1R1m,
K1U1S11S BZ1111 (1P1-58)|



1P1 58 t Wz1D11

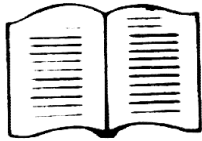
Rj R Dwt` i c0qvRbxZv

gvfQi Rj vktq tkljv RvZxq Dwt` i c0qvRbxZv metPtq tenk| Dwt` tfvRx gvQ thgb- iB, KivZjv, Pmcjv, cwt BZ`w` cavbZ tkljv tLtg evtP| Zv Qvov AtbK tkljv AvtQ th`tjv Abg0bx ev zooplankton Gi Lv`| Avevi zooplankton Avakisk gvfi Lv`| tkljv ntjv Rj vktqi metPtq eo c0ugK Drcv`bKvix Dwt``j| cktzi Gt` i cwi gvY tenk`vKtj gvfi Drcv`b tenk nq| cktzi mvi e`envi Kiv nq tkljvi cwi gvY evovevi Rb`| cktzi tkljv tenk`vKtj Wzsl Dwt` ntZ cvtibv|

tkljv ntjv Rj vktqi
metPtq eo c0ugK
Drcv`bKvix Dwt``j |
cktzi Gt` i cwi gvY tenk`
vKtj gvfi Drcv`b tenk
nq|

M0m Kiv RvZxq gvQ Zs`RvZxq I mbgw34Z tkljv Lvq| G`tjvi cwi gvY tenk`vKtj cktzi
M0m Kiv RvZxq gvfi Drcv`b tenk nq|

djavix D`Pzi Dwt` wKQygvfi Lv` inmtete e`euZ nq| thgb- 9l2` cvb tZj mcqv I`vB
micwt Lv` inmtete e`envi Kti| ZvQvov hv` KLbl cktzi i cwti Mfxi Zv Ktg hvq ZLb
Gaitbi Dwt` cktzi i cwtiK ViUv ivLtz mrvh` Kti| KLbl KLbl djavix Dwt` gvfi
Avktj`j inmtete e`euZ nq|



mvi gg Rj R Dwt` c0gZ` Gaitbi | h`v- tkljv RvZxq mbw34Zi Dwt` Ges djavix Dbz
Dwt` | tkljv RvZxq Dwt` i gvfiS Abyev cwt4Ub RvZxq tkljv, Zs`RvZxq tkljv, mbgw34Z
tkljv Dtj LthvM`| djavix D`Pzi Dwt` i gvfiS fimgvb Dwt`, Wzsl Dwt`, mb0bkxj
Dwt` I j Zvfv Dwt` i big Dtj LthvM`| AbyDwt` gvfi Ges AYyc0Yx ev zooplankton
Gi Lv`| wKQydjavix Dwt` wKQygvfi Lv`| Gme Dwt` tKvb tKvb mgq gvfi Avktj`j
inmtete e`euZ nq|



cuVvEi gj'iqb 6.1

mWk DEti ctk Wk Py (✓) w b|

1/ Rj R Dm cwbZ KZ ai#bi?

K) 2

L) 3

M) 4

N) 5

2/ tkIj v RvZxq Dm KZ ai#bi?

K) 2

L) 3

M) 4

N) 5

3/ dZavix Dm KZ ai#bi?

K) 2

L) 3

M) 4

N) 5

4/ AbyDm tkwb&ai#bi cWxt`i Lv`?

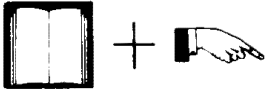
K) e'it0i

L) m'ici

M) g'itQi I Abg'Yxi

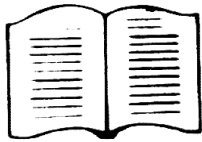
N) KxUcZt'i

cW 6.2 Rj R AvMvQv I ǞwZKi KxUcZ½`gb I wqšY



G cW tkłI Avcwb –

- Rj R AvMvQv `gb I wqšY m=útk̃eYθv KiłZ cviłeb|
- Rj R ǞwZKi KxUcZ½`gb I wqšY m=útk̃eYθv włZ cviłeb|



gvQ Pvlł fij Drcv`b tclZ ntj Rj R AvMvQv I ǞwZKi KxUcZłzi `gb Ges wqšY`i Kvi|

AvMvQv `gb I wqšY

wb=ñj wLZ Dcvłq Rj R AvMvQv `gb Kiv m=ē t

- hwišK Dcvłq/KwqK kłg `gb
- i vmiqwbK cłqıqıq `gb
- `RweK Dcvłq `gb

hwišK Dcvłq `gb

Dwłc Kivli bvbv aiłbi hš;AvłQ| Gme hš;θviv cvmbi włłPi, fvmgıv Ges wM@bkıj I j Zıłbv Dwłc łKłU miłbv m=ē| Avgıł`i łłk G aiłbi e`e`v e`qmıłcǞ| łmRb` kłgK j wMłq KwP włq łKłU nıłZ evłku θviv miłbv thłZ cvłi| Złe G cłqıqıq łkljv miłbv m=ē bq|

i vmiqwbK Dcvłq `gb

Kcvi mij łdU ev ZłZ, Kcvi mıBłUU BZ`w` i vmiqwbK `ē` θviv łkljv RvZıq Dwłc `gb Kiv hvq| Ab`włk bvbv aiłbi nviwemıvBW θviv dıyavıx Dwłc `gb Kiv thłZ cvłi|

`RweK wqšY

Młm Kıv,`vB mi cıwł, łZj wıqıv BZ`w` gvQ θviv Rj R Dwłc `gb m=ē| Bmi vBłj Nutria bvgK B`ı RvZıq cłıx θviv cłzi i Rj R Dwłc wqšY Kiv nłq`vłK|

Kcvi mij łdU ev ZłZ,
Kcvi mıBłUU BZ`w`
i vmiqwbK `ē` θviv łkljv
RvZıq Dwłc `gb Kiv
hvq|



Ablyj b (Activity) t aly, Avcbri emoi cvłk Rbve iıj mıłnłei GKıw cłz AvłQ hvłZ wıfıbıaiłbi AvMvQv w`gıv| H cłzi i AvMvQv `gb Kivi Rb` Avcwb ZıłK Kx aiłbi cıvgk̃ıłłeb Zı hvı mnKıłi wı Ly (Abııı100 kã)|

wqšY

cłz łłK AvMvQv `gb Kivi ci hı Zıł`iłK wqšYıv bı ivLv hvq Zıntj Avevi Rj R Dwłc` cłz fıı thłZ cvłi| łmRb` Rj R Dwłc wqšYıv ivLvi Rb` wb=ñj wLZ e`e`v MııY KiłZ nłe t

- cłz wqıgZ fııe AvMvQv gıı ivLvi Rb` hZıwbłZ nłe| AvMvQv nı qıı mıł` mıł` Zı mııłq łdj łZ nłe|
- cłz Ggb Mıııı ivLłZ nłe hvłZ cłzi i Zııq młııı Avłjv bı cıı|
- cłzi i cıııı w`gıv Rj R Dwłc` i łMııı Dcııı łđj włZ nłe|

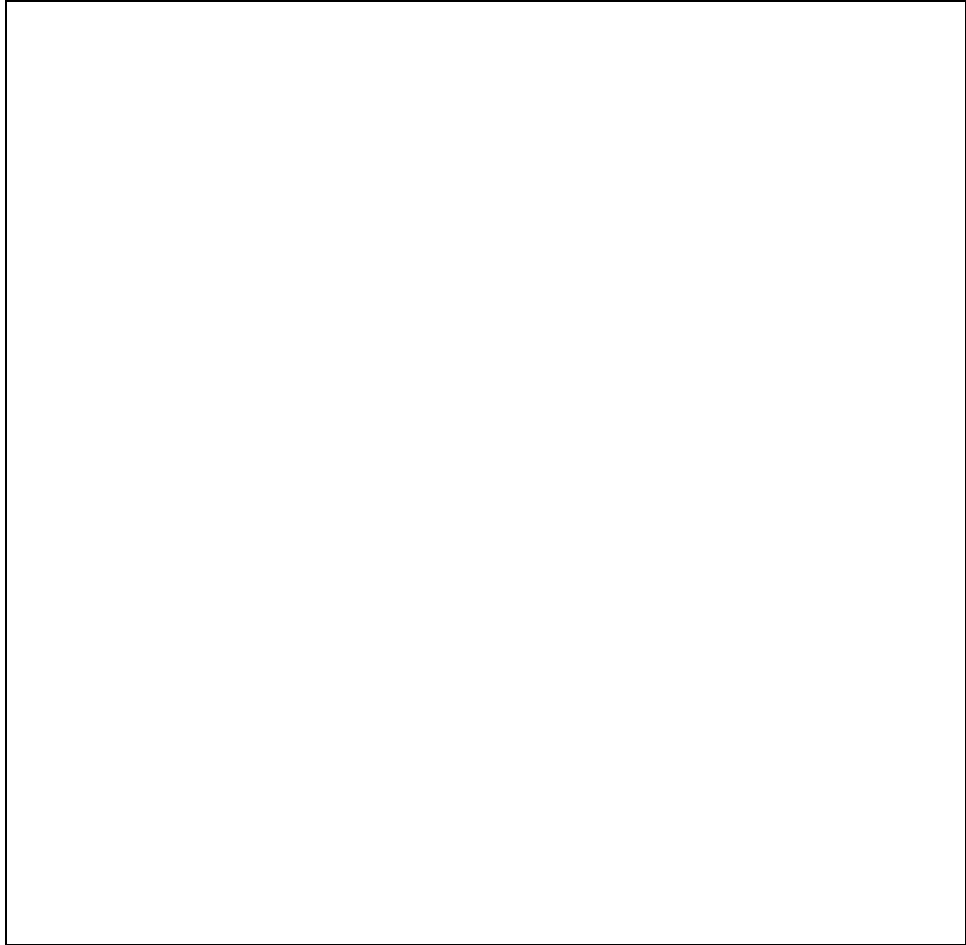
Kul. I cju Dbqbb`z

- ckyzi AZ`waK mvi c0qM bv Kitj tkIjvi Dc`è nte bv| cjuZb ckyzi i tejvq cBv Kv`v mwi tq tdj tZ nte|
- thme ckyzi teuk tkIjv nI qvi c0YZv _vtK tm, tjvtZ wj fvi Kvc©gvQ QvoTZ nte|

thme ckyzi teuk tkIjv
nI qvi c0YZv _vtK
tm, tjvtZ wj fvi Kvc©
gvQ QvoTZ nte|

¶wZKi KxUcZ½`gb I ubqšY

gvfQi tcvbvi Rb` AtbK cZ½ ¶wZKi | ckyzi nwa tcvKv, jwV tcvKv I weirfbæKxUi iK Rtb#(wPÎ-59)|



wPÎ 59 t weirfbæai#bi KxUcZ½

G, tjv gvfiQi tcvbvi c0z ¶wZ Kti _vtK| thme KxUcZ½ evZvm tbi qvi Rb` cwbi Dci Avtm tm, tjvtK gvivi Rb` tKtiwmb tZj ev wWtRj e`envi Kiv thtZ cvfi| mwi lvi ev bwitKtj i tZtj i mvt_ Kvc0 KvPvi mvevb wgwktq`èY`Zwi Kti ckyzi e`envi Kitj AtbK aitbi KxU gviv cto| wWcUvti. Øviv ¶wZKi KxUi`gb mæe| tKtiwmb e`envi Kitj Zvi cwigvY nte c0Z kZvstK Avav wj Uvi| wWtRj e`envi Kitj Zvi cwigvY ntZ nq 1 wj Uvi | gkwi i Rj Uvbtj AtbK KxU mivtbr mæe|

KxUi ubqšY

gvšS gvšS Rvj UvbTj ¶WZKi KxUcZ½ ubqšY _vtK| gv0 eo ntq tMtj AþK KxU tLiq
tdtj |



mvi gg hwsK, i vniqubK I RweK Dcrtq Rj R Dwtc `gb Kiv hvq| hš; Øviv ev kigK
j wMtq Rj R Dwtc `gb Kiv hvq| Kcvi mij tdU, Kcvi mvBtUU Øviv Rj R Dwtc `gb Kiv
hvq| ubqwgZ cktzi i hZambtq, cktz Mfxi Kti, cktzi i cvo ntZ Dwtc`i , av mwi tq cwiwgZ
mvi cØqvM Kti I mj fvi Kvc†Qto Rj R Dwtc ubqšY ivLv mæ| tKti vmb, wVcUvti-
Øviv ¶WZKi KxUcZ½ `gb Kiv hvq| gvšS gvšS cktzi Rvj UvbTj KxUcZ½ ubqšY _vtK|



cuVvĚi gj'iqb 6.2

mĚK DĚti i cuĥk ĚK ěPy (✓) ě b|

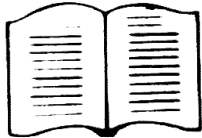
- 1| KZ i Kg Dcrtq Rj R DĚmĚ ěbqšĚ Kiv ĥiq?
K) 2
L) 3
M) 4
N) 5
- 2| tKvb&ai ěbi cĚĚZĚZ Kcvi mij tdu eĚenvi Kiv nq?
K) ĥĚšĚ
L) i ěmĚqěbK
M) ěRĚK
N) tKivUvB bq
- 3| gvQ tQto tKvb&ai ěbi cĚĚZĚZ Rj R DĚmĚ ěbqšĚ Kiv ĥiq?
K) ĥĚšĚ
L) i ěmĚqěbK
M) ěRĚK
N) tKivUvB bq
- 4| Kx ěgtbi RbĚ tKĚi ěmb I ěĚcUĚi. eĚĚZ nq?
K) gvQ
L) AvMvQv
M) KĚUcZ½
N) DcĚti i me, ějv

cw 6.3 cwtZ tkI jv eg Ges Dnvi ibqšY



G cw tkI Avcb –

- eg IK Zv e`l`v Ki tZ cvi teb |
- Kx Kvi tY tkI jv eg nq Zv eY`v Ki tZ cvi teb |
- Kxfite eg ibqšY Kiv hvq Zv Avtj vPbv Ki tZ cvi teb |



eg

hLb tKvb Kvi tY cwtZ e`vcK cwi gvY tkI jvi cwi gvY teo hvq ZLb ZvtK eg (Bloom) etj | tKvb Kvi tY cktzi mti i cwi gvY teo tMtj tkI jvi eg ntZ cti | c`vbZ 3u Kvi tY cktzi mti i cwi gvY evotZ cti | h_v t

- cjuZb cktzi `RieK c`v`Rtg
- cktzi Ku`g Lv` e`envi Ki tj
- cktzi tewk mvi e`envi Ki tj

hLb tKvb Kvi tY cwtZ e`vcK cwi gvY tkI jvi cwi gvY teo hvq ZLb ZvtK eg (Bloom) etj | tkI jvi eg ntj gvQ gvi v thtZ cti |

thme tkI jvi Kvi tY eg nq tm, tj vtK mec`4bK tkI jv ejv nq | Gt`i gvtS AvtQ Gbwebv, bWtj vi qv BZ`w | tkI jvi eg ntj gvQ gvi v thtZ cti | etgi mgq cwbi eY`meR, nj t` meR, jvj cvUj, bxj meR BZ`w ntZ cti |

thme tkI jv `vivi eg `Zwi nq tm, tjv Dcti tftm `vKtZ cti ev cwtZ wgtkl `vKtZ cti | etgi GK ch`q cktzi Dci mti gZ cto | evZvm c`vvnZ ntj Giv cktzi GKiv tK wltq Rtg | eg ntj cktzi i cwtZ `M` `Zwi nq |

eg `gi tYi h_v `vqx I miguqK | `vqx eg `Zwi nq Microcystis, Anabaena BZ`w `vivi |

eg `gi tYi h_v `vqx I miguqK | `vqx eg `Zwi nq Microcystis, Anabaena BZ`w `vivi | thme cktz cjuZb Ges th, tj vtZ cPz `RieK c`v`e` `gib `vtK tm, tj vtZ `vqx eg nq | mivi YZ gRv cktzi `vqx eg t` LtZ cvl qv hvq |

Ab`v tK miguqK eg nq tKvb Kvi tY cktzi mvi tewk cotj Ges cktzi Ku`g Lv` e`envi Ki tj | etgi mgq cktzi i gvtQi t`tnl etgi MÜ `Zwi nq | ZLb gvQ tLtZ MÜh` nq | GKUvbr `vN` b tiv` cotj B eg nq | tm Rb` tm tP` t` tK wltm`ti i wFZi eg t` LtZ cvl qv hvq | A`bK mgq Wzš` Dv`c aYsm Kivi Rb` AwaK cwi gvYi BDvi qv I uJ.Gm.uc. e`envi Kti cktzi eg `Zwi Kiv nq | eg ntj thtnZm`hP Avtjv cwbi Lv` wbtP thtZ cti bv tmRb` Wzš` Dv`c Avtjvi Afite gvi hvq |

cktzi eg ntj ivtZi tejvq cktzi i cwbi Av` tRb k`b` tbtg Avm tZ cti Ges GtZ Kti gvtQi e`vcK gZz ntZ cti |

cktzi eg ntj ivtZi tejvq cktzi i Av` tRb k`b` tbtg Avm tZ cti Ges GtZ Kti gvtQi e`vcK gZz ntZ cti | h`w` w`tb AvKvk tgNjv `vtK Ges evZvtmi Zvcgv`v tewk `vtK Zv ntj cktzi i Av` tRtbi cwi gvY e`vcK fite Ktg thtZ cti | Gi dtj cktzi i gvtQi e`vcK ¶vZ ntZ cti | G Ae`vq cktzi i cwtZ w`úW tevW Pwjtq, evkur`tg cmb Avt` wj Z Kti ev `gKj `vivi cktzi i cmb cktzi wltq w`tj cwtZ Av` tRb thvM ntq gvtQi gZz nvi KgtZ cti | hLb gvQ Dcti tftm Dfv ZLb gtb Ki tZ nte cktzi i cwtZ Av` tRtbi Afite ntq tQ | ZLb Av` tRb wgv`vivi Kiv, tjv Ki tZ nte |

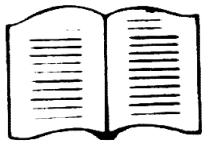
eg ũbqšY

gRv cKzi eg ũbqšY KiĴZ ntj kxZKvtj cKz i ũKtq cKzi Zjv ĩ_tK cDr I DŶP Kiv mwi ĩq tđj ĩZ nte| cDr I Kvj Kiv mwi ĩq tđj ĩj cKzi eg nte bv Ges gvtQi Drcv`b fiv nte|

cKzi 5-12 ũc.ũc.Gg.
Kcvi mij ĩdU e`envi
KiĴj eg ũbqšY AvĴm|
Avevi .5-1 ũcũcGg nvti
Kcvi mĴBĴUU e`envi
KiĴj eg ũbqšY AvĴm|

Ab`ir ĩK cKzi 5-12 ũc.ũc.Gg Kcvi mij ĩdU e`envi KiĴj eg ũbqšY AvĴm| Avevi 0.5-1 ũcũcGg nvti Kcvi mĴBĴUU e`envi KiĴj eg ũbqšY AvĴm|

- tkI jv gvivi ci Mu I I P-chlorophyc-1, I-dimethyl urea e`envi KiĴj mnĴR eg nĴZ cvti bv|
- 2, 4-ũW tmũWqvg Avi ĩmbvBW Đivi tkI jv gviv hvq|
- ũmgvmbŃ cŃqvtMi nvi 0.25-0.50 ũc.ũc.Gg|
- ũmj fvi KvcRvZiq gvQ Đivi I AĴbK aiĴbi eg ũbqšY m`e|
- cKzi KĐi cvbv nĴZ ĩ ĩj I eg ũbqšZ nq| cKzi 10-25% Astk KĐi cvbv i vĴZ nq|



mvi gg hLb ĩKvb KvĴY cmbĴZ e`vck nvti tkI jvi cwi gvY teto hvq ZLb ZvtK eg etj| cvZb cKzi RveK c`v_Rtg, cKzi Kulg Lv` e`envi KiĴj Ges cKzi tewk mvi e`envi KiĴj cKzi eg nq| eg ntj gvQ gviv thĴZ cvti| etgi mgq cmbi i0 meR Ges bvbv iĴoi nĴZ cvti| etgi GK cvhĴq cmbi lci mtii gZ cĴo| eg `gĴbi ĩvqx I mvgvqK| gRv cKzi ĩvqx eg nq| etgi mgq gvĴQi ĩ ĩnI etgi MŪ_vĴK| GKUivv `xNŶ b ĩiv` cotj eg nq| ĩmĴP`Ĵ -ũWĴm`Ĵ ntjv cĴvbZ e- ĩgi mgq| cKzi i cmbĴZ eg `Zwi KĴi WzśDũc ũbqšY Kiv hvq| cKzi eg ntj i vĴZ cmbĴZ Av ĩRĴbi Afve NĴU Ges GĴZ gvQ gviv thĴZ cvti| cKzi ĩũW tevU Pmij ĩq evkur ĩq cmbĴZ j ũW ĩgti A_er`gKj Đivi cKzi i cmb cKzi ũQũtq Av ĩRb ũgkvĴbvi e`ve`v Kiv thĴZ cvti| hLb gvQ DcĴi ĩfĴm DĴV ZLb eĴĴZ nte th cmbĴZ Av ĩRĴbi Afve nĴqĴQ| Kcvi mij ĩdU, Kcvi mĴBĴUU, ũmgvmb I tmũWqvg Avi ĩmbvBW ĩviv eg ũbqšY Kiv hvq| gRv cKz i ũKtq cDr Kiv ĩ tđj ĩ ĩj ĩvqx eg_vĴK bv| ũmj fvi KvcR KĐi cvbv ĩ ĩq I eg ũbqšY m`e|



cuVvEi gj`iqb 6.3

mWk DEti i cuK Wk iPy (✓) i b|

- 1/ hLb cmbtZ e`vcK nrti tkljv tefo hvq ZLb ZvtK Kx etj ?
K) egj
L) RbZv
M) m`u`iq
N) goK

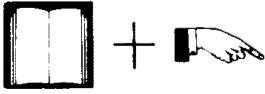
- 2/ Wk Kvi tY egj nq?
K) cKzi Aw tRtbi cwigvY tefo tMtj
L) mrti i cwigvY tefo tMtj
M) mrti i cwigvY Ktg tMtj
N) cKzi i cmb Ktg tMtj

- 3/ `vqx egj tKvb&aitbi cKzi nq?
K) cjuZb gRv cKzi
L) bZb cKzi
M) Mfxi cKzi
N) AMfxi cKzi

- 4/ gvQ hLb l cti tftm Dtv ZLb cmbtZ Wktmi Afive nq?
K) Lv`i
L) KveB-WiBA- vBtWi
M) Aw tRtbi
N) Avtj vi

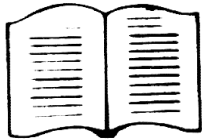
- 5/ tKvb&gvQ 0viv egj mbqšY m`e?
K) KmcP
L) Mm Kvc©
M) Wmj fvi Kvc©
N) KvZj v

cW 6.4 AvMvQvi mivth` Kfuv÷ mvi `Zvi I e`envi



G cW tkfI Avcib –

- Kfuv÷ mvi Kx Zv e`vL`v Ki tZ cvi teb|
- AvMvQvi Oviv Kfuv÷ mvi `Zvi I Zvi e`envi m`utK`Avtj vPbv Ki tZ cvi teb|



Kfuv÷ mvi

Kfuv÷ mvi `Zvi Kiv GKvU bZb` chv`B | G`cl`uqvq Ae`euZ Dv`m`c KjtK mvi vnmvte e`envi Kivi Dc`thvMx Kti tZvjv hvq| Kfuv÷ mvi gj-Zt `RveK mvi | Gi` clq melvB tMvei I AvMvQv`v`K|

Kfuv÷ mvi `Zvi

Kfuv÷ mvi `Zvi Kivi mgq v`b`v`j`uLZ c``t`q`c`_tjv AvbviY Ki tZ nte|

th` c`k`zi Kfuv÷ mvi e`envi Kite tm` c`k`zi`i` c`v`oi` Kv`Q` GKvU MZ`K`i` tZ nte|` clZ` 100` t`KvR` Kfuv÷ mvi`i` Rb` M`Z`P` AvKvi nte 25-27` Nbd`|

Gici RjR Dv`m`c, tMvei, P`b` I` BDvi`qv` msM`h` Ki tZ nte|` th` c`vi`gvY` AvMvQv` e`envi` Kite` Zvi` t`o`_Y`_v`K`te` tMvei |` A`_v`P` 100` t`KvR` AvMvQvi` miv`_` 150` t`KvR` tMvei` e`envi` Ki tZ nte|` Ab`v`v``K` P`b` I` BDvi`qvi` c`q`v`Rb` nte` AvMvQvi` 2%` Kti |` A`_v`P` 100` t`KvR` AvMvQvi` Rb` 2` t`KvR` P`b` I` 2` t`KvR` BDvi`qv` e`envi` Ki tZ nte|

GKvU` t`Kv`v`j` v``t`q` P`b` Ges` BDvi`qv` L`y` f`ij` f`v`te` v`g`v`k`t`q` mgvb` 4` f`v`M` f`v`M` Kti` i`v`L`Z` nte|` GKB` f`v`te` Avj`v`v` Avj`v`v`v`f`v`te` tMvei` I` AvMvQv`_tj`v`K` mgvb` 4` f`v`M` f`v`M` Ki tZ nte|

DcKiY`_tjv` M`Z`P`X`K`v`v`i` Av`M` GKvU` v`c`v`f`v`m` c`v`Bc` A`_ev` evk` v``t`q` GKvU` c`v`Bc` `Zvi` Kti` D`3` c`v`B`c`i` t`Kv`B` GK` c`v`k` 4/5` u`u`Q``K`ti` v`b`t`Z` nte` Ges` c`v`Bc`v`U`K` M`Z`P` g`v`S` c`j`o` v``t`Z` nte|` c`v`B`c`i` gv`_v` M`Z`P` g`j`Li` 1` d`y` Dc`ti`_v`K`te|` c`v`Bc`v`U` e`envi` Kiv` nq` Kfuv÷ mvi`i` v`f`Z`ti` `Zvi` M`v`m` t`v`i`t`q` hv`l` qvi` Rb`|

DcKiY`_tjv` M`Z`P`
X`K`v`v`i` Av`M` GKvU`
v`c`v`f`v`m` c`v`Bc` A`_ev` evk`
v``t`q` GKvU` c`v`Bc` `Zvi`
Kti` D`3` c`v`B`c`i` t`Kv`B`
GK` c`v`k` 4/5` u`u`Q``
Kti` v`b`t`Z` nte` Ges`
c`v`Bc`v`U`K` M`Z`P` g`v`S`
c`j`o` v``t`Z` nte|

G` KvR`vU` t`kl` n`tj` c`l`t`g` tMvei`i` GKf`v`M` M`Z`P` Z`j`vq` mgvb` c`j`y`K`ti` v`v`v`Q`t`q` v``t`Z` nte|` tMvei`i` `t`i`i` Dci` GKB` f`v`te` RjR` Dv`m`c`i` GK` f`v`M` v`v`v`Q`t`q` v``t`Z` nte|` Zvici` RjR` Dv`m`c`i` Dci` P`b` I` BDvi`qv` v`g`k`f`Yi` GKvU` f`v`M` v`v`v`Q`t`q` v``t`Z` nte|` Gi` Dci` Avevi` tMvei` v``t`q` `i`i` Kite|` Gf`v`te` t`kl` ch`S`f` t`L`v` hv`te` tMvei, AvMvQv` I` P`b`-BDvi`qvi` P`v`v`U` Kti` `li` n`t`q`T`|

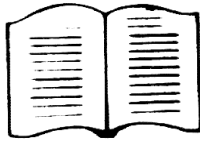
me`_tjv` DcKiY` X`K`v`v`i` c`i` M`Z`P` g`j`v`U` Lo` v``t`q` L`y` f`ij` f`v`te` t`X`K` v``t`Z` nte` Ges` K`t`q`K` evj`v`Z` c`v`b` M`Z`P`Q`v`U`t`q` v``t`Z` nte|` Gici` M`Z`P` g`j`v` c`ij` v`_b,` u`b,` ev` P`v`v`B` v``t`q` t`X`K` v``b` hv`t`Z` t`iv` ev` ev`v`v`t`Z` `i`K`v`t`Z` ev` v`f`R`v`t`Z` b`v` c`v`i` |` Gf`v`te` 15-16` v``t`b`i` v`f`Zi` Kfuv÷ mvi` e`envi`i` Dc`thv`Mx` nte|

Kfuv÷ mvi `Zvi n`q` tMj` c`k`zi` G` mvi` e`envi` Kiv` P`j` |` c`k`zi` Kfuv÷ mvi` e`envi`i` Av`k`g`v`v`v` GLb`l` v`i` nq` v`b` |` Z`te` G`t`q`v`t` `R`veK` mvi`i` e`envi`i` b`v`v`Z` AvbviY` Kiv`B` t`k`q` |` A`_v`P` c`l`Z` k`Z`v`t`k` 8-12` t`KvR` mvi` e`envi` Kiv` t`h`Z` c`v`i` |` Z`te` G` c`vi`gvY` G`K`v`ti` b`v` Kti`

2 evti e`envi Kitj wect`i SxK Kg _vKte| KviY mvti i cwi gvY tenk ntq tMtj cKzi
Avr tRtbi Afve ntZ cvti | Kt`uv÷ mvi cKzi uQuUq br w`tq KtqK`vrb Rgv Kti w`tZ
nte|



Ablyj b (Activity) t Avcbvi emoi cvtk th cKz ev Rjvkq AvtQ Zri cvtkB wevfbæ
DcKiY mivK cwi gvY ugvkZ Kti Kt`uv÷ mvi `Zwi Kij|



migg^q Ae`üZ RjR Dv`c , tj vtK Kt`uv÷ Kti mvi wntmte e`envi Kiv hvq| Kt`uv÷
mvi gj-Z `RweK mvi | Kt`uv÷ mvti i Rb` AvMvQv, tMvei, Pz I BDwi qv e`envi Kiv nq|
DciKiY , tj vtK `ti `ti wevQv Lo w`tq tXtK w`tZ nq| Kt`uv÷ mvi `Zwi nI qvi mgq th
M`vm Drcbenq Zv tawi tq hvI qvi Rb` MtZP gvS GKwU uQ`hÿ cvBc XwKtq w`tZ nq|
15-16 w`tbi w`fZi Kt`uv÷ mvi `Zwi nq| Kt`uv÷ mvi e`envti `RweK mvi e`envti i wbgg
Abvi Y Kiv nq|



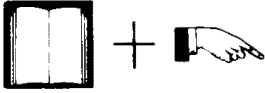
cuVvEi gj'iqb 6.4

mWk DEti i cuK Wk Pý (✓) w b|

- 1/ Ktúv÷ mvi c×wZtZ tKvb&DcKiYi mØ'envi nq?
K) Pbi cmb
L) BDwi qv
M) AvMvQv
N) tMve i
- 2/ Pbi cwi gvY AvMvQvi cwi gvYi KZ Ask ntZ nq?
K) 1%
L) 2%
M) 3%
N) 4%
- 3/ MtZcŭg tKvb&DcKiY weQvZ nq?
K) AvMvQv
L) tMve i
M) Pz
N) BDwi qv
- 4/ Ktúv÷ mvi meKl tKvb&DcKiY e'envi KiZ nq?
K) tMve i
L) AvMvQv
M) Pz-BDwi qvi wgvY
N) Dcti i GKwJl bv
- 5/ Ktúv÷ mvi KZ w tbi wFZi %Zwi nq?
K) 10-15 w`b
L) 15-16 w`b
M) 25-30 w`b
N) 5-10 w`b

e`enwiK

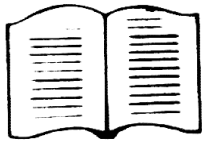
cW 6.5 RjR AvMvQv I řwZKi KxUcZ½ mslMh I kbr³KiY



G cW řkřI Avcb –

- RjR AvMvQv mslMh I kbr³ KiřZ cviřeb|
- KxUcZ½ mslMh I kbr³ KiřZ cviřeb|

DcKiY

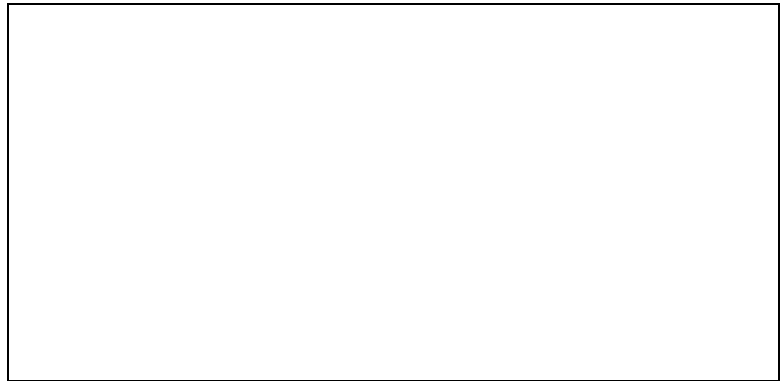


evj wZ, wřtbi mv`v _vj, KvW, wPgUv, I qvPMm, řcUwMm, wBVj, úvBW, řgMwbcvBs Mm, eUš tccvi ev Uqřj U tccvi, KvřřřgM, Rij, cvj w_b evM, mřv, KLbI řbřKv, j řř evka, řbvU LvZv, řcWřj, kbr³KiřYi eB, digwř b, KřřPi ev cWřřřKi řřQ řevZř |

cřmwřK Z_`

j Zřřbv Dřřř

G řřvi řřřv cřřoi KvřQ _řřK Ges Wwř cřřři i gvS w řř evřřř _řřK| Gme Dřřř Ař cwb nřřB Kvřřřřřv KvUřřZ cviřeb| 15-20 w j Zř řřřU cwbmn evj wřřř i vLřř | j řřř i vLřeb hřřř j Zř řř řřřZ cvZř, mřř nřř řřř dj _řřK|

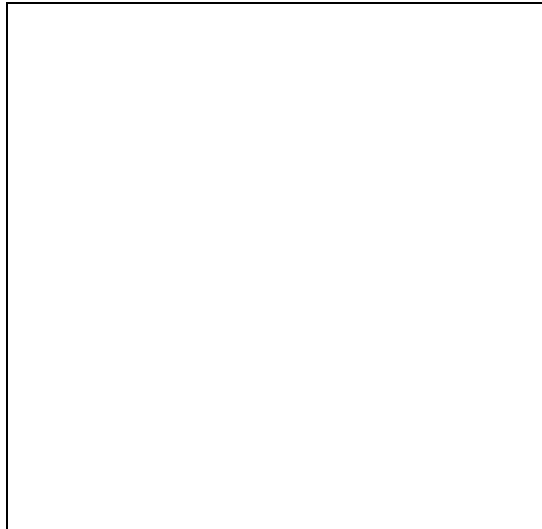


wřř 60 t j Zřřbv Dřřř

wBřřřřř Dřřř

cřřoi Ař cwb wBřřřřř Dřřř řřř j Zřřbv Dřřřř i gZ mnřř mslMh KiřZ cviřeb| Ař cwbřřř řřřř řřřřř Kvřřřřř Dřřř řřř KvUřř Ges 15-20w MvQ evj wřřř i vLřř|

Dbřřř AwřK cwb wBřřřřř Dřřř řřř mslMh Kivi Rbřřř mřřřř cwbřřř břřřř cřřřřř nřřZ cřři A_ ev řřřřř cřřřřř nřřZ cřři | Kvřřřřř řevUv mn cvZř, řřř I dj _řřřř řevUvnn řřřř mřřř řřřřř GK mřřř řřř evj wřřř cwb mn i vLřř|



ıPĪ 61 t ıbM@bkıj DıMĉ

fımgvb DıMĉ

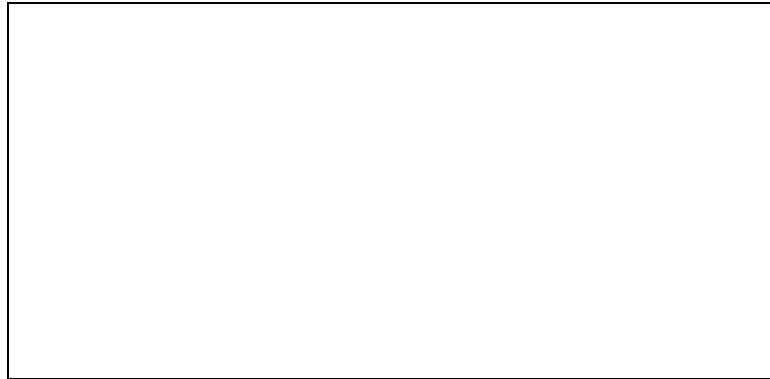
cđđı i fımgvb DıMĉ ĩj v nıZ Ges gđMi 0ıv msMđ Kđı cıb mnđıM evj ıZđZ i vLđđ| G KıRıU cıbđZ tđg ev tđđKıv eđm KđđZ cııđeb|



ıPĪ 62 t fımgvb DıMĉ

Wzđı DıMĉ

Gme DıMĉ cıbı ıbđP _vđK| Kđđı 0ıv GđıđK tMıov mn KıUđ Ges cıb mnđıM evj ıZđZ i vLđđ| cıb teık nđj Wz ıđđ KđUđZ nđe|



WPT 63 t WzS Dwmc

Kihvuj x

- evj wZ, gM, Kv`l tevZj, cij w_b e`vM, mZv, j`p evka, Rvj mnthvM cKzi ev Rj vktq hrteb|
- cKzi i cwbZ me`gvb meaitbi Dwmc I KxUcZ½ mSMni e`v Ki`eb Ges e`enwi K LvZvq wj tL Ges Qwe GtK wDUi tK t`wL tq h_vmg tq`v`ji wbb|

qWZKi KxUcZ½

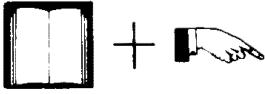
gkvi xi GKwU tQvU teo Rvj, A_er wZb tKvYv Rvj Oviv cKzi i m`e` me aitbi AA tj KxU cZ½ mSMni Rb` Rvj UvbZ nte|

gkvi xi GKwU tQvU teo Rvj, A_er wZb tKvYv Rvj Oviv cKzi i m`e` me aitbi AA tj KxU cZ½ mSMni Rb` Rvj UvbZ nte| cZwU Uvrb hZ aitbi KxUcZ½ Avmte tm, tj v cij w_b e`vM, tev t ev evj wZ tZ cwb mnKv i i vL tZ nte| tevk t`ixi m`ebv`vK tj 5% digv vj b Oviv G, tj v tK msi qY Ki tZ nte| G t q t evj wZ tZ i vLv hrte b v, i vL teb tevZ t ev Rv t i |

mSMni KvR m`ubentj me bgbv, tj v tK MtelYvMv t wbtq Avm tZ nte Ges kbr³ Ki tYi KvR i i y Ki tZ nte|

- MtelYvMv bgbv, tj v Avbri ci _vj ev tU tZ tX tj fvj fite aB t q gqj v I AveR b v gY Ki tZ nte|
- Gi ci t` tL t` tL m`e` mei K t gi Dwmc I KxU, tj v tK Avj v` v _vj, I qvPM- v m ev tcvwM t m i vL tZ nte|
- Gici eB t qi eY b v I wP t i m t _ wgvj t q cZ wU Dwmc I KxU i cR v wZ ev ersj v bvtg kbr³ Ki tZ nte| Gi Rb` eB t` tL GKeri Dwmc I KxU, tj v tK wP t b t b l qv` i Kvi | kbr³ Ki Y tkl n t j LvZvq wP t GtK cR v wZ, tj v i bvg wj tL i vL teb| GKwU K_v g t b i vL tZ nte cZ wU cR v wZ tK kbr³ Kivi Rb` GKwU` wj AZ` s l` uo` `enk o` _v tK | tm `enk o`, tj v wP t b wbtj kbr³ Ki tY tKv b Amv eav nte b v | Gfite qWZKi KxUcZ½ mSMni Kib Ges kbr³ Kvix `enk o` wj tL wDUi tK t`wL t q h_vmg t q`v`ji wbb|

cW 6.6 Kֆսօv÷ mvi cՕւշ

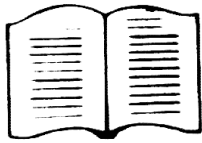


G cW ֆkֆI Avcւb –

■ Kֆսօv÷ mvi ՚Zւi Kiv I Zvi e՛envi AvqZjKiֆZ cvիեb|

DcKiY

Rj R DւԴԳ, ֆMvei, Pֆ, KPֆx cvbv, evk/cւBc, ֆKւ՛ւj, UKix, Lo, cւj յ_b/Qb/ PւUvB|



cxւշ

ւbֆսj յLZ cւiցւY DcKiY, ֆjv mսMձ Kիկ

1 AvMvQv	1000 ֆKւR
2 ֆMvei	1500 ֆKւR (AvMvQvi ֆ՛o , Y)
3 Pֆ	2ֆKւR (AvMvQvi 2%)
4 BDւi qv	2 ֆKւR (AvMvQvi 2%)

- DcKiY, ֆjv gvcvi ci gւJi Dci Avjւ՛ւ Avjւ՛ւ ֆիե iւLկ|
- ֆKւ՛ւj թււ Gici Pֆ I BDւi qv Lկ ֆիյ ֆիե յցւկZ Kիկ Ges GKֆI iւLկ|
- Gici ֆMvei, AvMvQv I Pֆ BDւi qvi յցկY G յZւU DcKiY mgւb 4 ֆիM ֆւM Kֆi Avjւ՛ւ ֆիե iւLկ|
- Gici 4 dֆ j ֆ GKւU evֆki ւֆZֆii յMU, ֆjv ֆKֆU cvBֆci gZ Kֆi GK ւ՛ ֆK 4/5 յU յQ՛Kֆi ւbb| A_er յcւֆւm cvBc I GKւR e՛envi KiֆZ cvֆi b|
- Gici cկֆi Avֆk cvֆk mgւb I DԲzRւqMւ 5' x 4' x 3' AvKւֆi ev 60 NbdֆJi GKւU MZ՛Kիկ|
- MֆZՓ Zjւq cvBֆci gZ ՚Zւi Kiv evkւU ev cvBcւU cֆZ ւ՛b| cvBֆci gvc thb MֆZՓ gկ nֆZ 1 dֆ Dcֆi _ւֆK| G cvBc թււ ւֆZֆii M՛ւm ֆււղ hւֆe| Gici cՕւղ ֆMvei 4 ֆիM ֆւM MֆZՓ Zjւq mgւb Kֆi ււQֆղ ւ՛b| GKB ֆիե ֆMvei Dci AvMvQvi 4 ֆիM 1 ֆւM ււQֆղ ւ՛b| AvMvQvi Dcֆi Pֆ-BDւi qv յցկֆY 4 ֆիM 1 ֆւM ււQֆղ ւ՛b| Avevi ֆMvei ւՆղ iւyKիկ| Gֆիե ֆk chՆ ֆ՛Lֆeb cՆZւU Dci KiY 4ւU ֆի nֆղQ|

GLb DcKiֆYi cւiցւY Kg ֆւk Kֆi Kֆսօv÷ mvi ՚Zւi Kivi ci cixղւ KiֆZ cvֆi b Ges Zv e՛envi K LvZւq ւPՆ mn ֆi Kւ՛Kիկ Ges mgqgZ Avcbvi յUDUիֆK ֆ՛ւLղ ֆիղi ւbb|



Povšgji`iqb

mswβ I iPbigj-K cĕæ

- 1| tkIjv I džavix DirM` i cKviťf` eYĖv Kily|
- 2| DirM` i cĕqvRbxqZv e`vL`v Kily|
- 3| Kx Kx Dcvťq Rj R AvMvQv `gb Kiv hvq Zv eYĖv Kily|
- 4| AvMvQv v̄bqšYi Dcvq eYĖv Kily|
- 5| Kx Kx Dcvťq ¶wZKi KxUcZ½ `gb Kiv hvq Zv vj Lly|
- 6| Kx Kx KviťY eg nq eYĖv Kily|
- 7| eg tKb ¶wZKi Zv Avťj vPbv Kily |
- 8| eg Kxfi`te v̄bqšY Kiv hvq Zv Avťj vPbv Kily |
- 9| Kxfi`te Kť`úv÷ mvi `Zwi Kiv nq eYĖv Kily |
- 10| Kxfi`te cKzi Kť`úv÷ mvi e`envi KiťZ nq Zv Avťj vPbv Kily |



DĚigjv

cW 6.1

- 1| K 2| L 3| M 4| M

cW 6.2

- 1| L 2| L 3| M 4| M

cW 6.3

- 1| K 2| L 3| K 4| M 5| M

cW 6.4

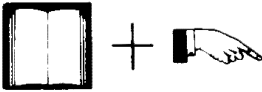
- 1| M 2| L 3| L 4| M 5| L

BDibU 7 grm" Lvgvi cwiKíbv

evsj vt`tki Av_@mrgwRK Dbqab, µgea@vb RbmsL`vi cwp Pmn`v ci-Y, wecy Rb#Mrôxi
`wii`^wetgvPb Ges AvZKgnis`vbi mthvM mwpfZ grm" m=ú` , iZcY@fugKv ivLtz cvi |
c0KwZK Rj vKq, tj vtZ AZxfZ grm" m=ut` i c0Pb@Qj weavq grm" Pvlx Ges mvari Y RbMY
AvaybK chvP`fZ gvQ Pftl i c0qvRbxZv Abyfe Ktiub | wKŠ µgwMZ RbmsL`v epxi Kvi fY
gvfQi Pmn`v e`vcK ep× tctqtQ | c¶všfi gvfQi c0KwZK Drcv`b I gvfQi c0c`Zv w`b w`b
KgtQ | Avgvt` i t`tk eZ@vb th cwi gvY gvQ Drcw`Z n`Q Zv c0qvRfbi Zzbrq AcLz |
gvfQi eZ@vb Drcv`b ep× KifZ ntj miKwi I temiKwi chf@q grm" Lvgvi `vcb AZxe
Rijx | Gi Rb` mdj fvt@ grm" Lvgvi cwiKíbv AZ`š , iZcY@ mWK Lvgvi cwiKíbv grm"
PvlxK FY tctZ mnvqZv Kti | grm" Lvgvi `vcfbi Rb` BfZigta` evsj vt`tk weifbæwYwR`K
e`isK mnRkfZ`FY c0vbi KgnwP MhY KifQ |

G BDibU grm" Lvgvi cwiKíbv Dfík", AvL`R mnthwMZvi Drmmgn, Rbej, hšcwZ I
cwiKíbv Ab`vb` cfwKmgñ, grm" Lvgvfi Avq I e`tqi nmvei ¶Y Ges cfYi wecyb
cxwZ m=úK@e`wii Z Avtj vPbv Kiv nqtQ |

cW 7.1 cwiKíbv Dfík", AvL`R mnthwMZvi Drmmgn



G cW tktl Avcwb-

- grm" Lvgvi `vcfbi I cwiKíbv Dfík" Avtj vPbv KifZ cvi teb |
- Kxfvte GKwU grm" Lvgvi cwiKíbv Kiv nq eY@v KifZ cvi teb |
- grm" Lvgvi c0Z0vi Rb` AvL`R mnthwMZvi Drmmgn Kx Kx Zv Avcwb wbt`R KifZ
cvi teb |



evsj vt`tki Rivzq A_@wZK Dbqab, Rb#Mrôxi Kgnis`vb Ges `et`wK gvY AR#bi t¶fI
gvQ Pvl wefkl fvgKv cij b KifQ | t`tk cte@gy Rj vKq ntfZ chvB cwi gvY gvQ Aviny Kiv
ntZv | weifbæc0KwZK I gby` mP Kvi fY gy Rj vktqi gvfQi Drcv`b nm cvl qvq ex
Rj vktq gvQ Pvl Kivi c0YZv ep× cif`Q | GQvov t`tk RbmsL`v epxi AbgvfZ gvfQi
Drcv`b ep× bv cvl qvq gvQ Pftl i , iZcY Avtiv teto tMfQ | evsj vt`tk AmsL` cKz, tWvev I
tQvU Rj vKq iftQ thLvfb gvQ Pftl i c0z m=tebv iftQ |

eZ@vb weifbæwYwR`K e`isKmgñ FY c0vb cxwZ mijxKiY Kti ¶z`grm" Pvlx` i mnR
kfZ`Ges FY w0QZv Znvej i AvL Ziq RvgvZ Qvov Z`vi Kx grm" Pvl FY c0vbi KgnwP
MhY KifQ | ZvQvov evwYwR`K wfiE`Z bZb bZb grm" Lvgvi `vcfbi Rb` weifbæ`isK
c0vj Z KgnwP, tj vtK Avtiv MwZkj Kivi Df`wM MhY KifQ |

GKwU Ar`k@grm" Lvgvi `vcfbi Dfík`vejxwb@e

- K) gvfQi Drcv`b ep× KifZ cKí Gj vKvi gvfQi Pmn`v ci-Y Kiv |
- L) Avq I Kgnis`vbi mthvM mwp Kiv |
- M) Dbz grm" Pvl chvP`/Avav wbeo grm" Pvl cxwZ c0qwm KifZ Rj vktq grm" Pftl i
c0vi KifZ mnvqZv c0vb |

evwYwR`K wfiE`Z bZb
bZb grm" Lvgvi `vcfbi
Rb` weifbæ`isK c0vj Z
KgnwP, tj vtK Avtiv
MwZkj Kivi Df`wM
MhY KifQ |

cKf cwiKfvi DfIk

grm`Lvvi `vcfbi
DfIk`thnZz
e`emvqK Dnv `vcfbi
cfeB cwi Kf br Kiv
Avek`K/

grm`Lvvi `vcfbi DfIk` thnZze`emvqK Dnv `vcfbi cfeB cwi Kf br Kiv Avek`K/
cwi Kf vi DfIk` cAbZ `wt
(1) Znvej thvMvZ AvKI P mjo Kiv
(2) cwi Kf brKiv xK e`emvqi mKj w`K gj`vqfb mrvqZv Kiv/

mWK cwiKfvi kZ

- evRvfi Ae`v hvPvB
- e`tqi cwi gvY ubaP Y
- kAgfKi cwi gvY ubYq
- cwi enb e`e`v gj`vqb
- cZthvMZv gj`vqb

mWK cwi Kf vi Rb`
Suk Ges AmvavmgR
Aek`B wefePbvq AvbZ
nte/

GB mg`lvePvi wefk- IY Aek`B ev`e wfvEK nZ nte/ tKvb Ae`vZB AvZ Drmrvx nI qv
mWK nte bv/ mWK cwi Kf vi Rb` Suk Ges AmvavmgR Aek`B wefePbvq AvbZ nte/
Lvvi cwi Kf vi ve`lvi Z weeiY j mKvix, FY`vZv ev Avv`R cZvbtK eStZ mrvh` Kti
th G Lvvi cwi Pij bv Ki tZ Kx Kx mgm`v ev Amvavi m`vxb nZ cvi /

e`emvqK cwi Kf vi vbnj mLZ cOkie DEi Aek`B _vKtZ nte t

- cwi Kf brKiv xK e`emvqK mvdj` ARfbi Rb` vbtR gvUffUW (motivated)?
- Drcv`b mgm`v, e`q, `fe`i Pvir`v wefk- IY mK ev`e m`vZ?

e`emvqK cwi Kf vi tgvivK_v n`Q cwi Kf brKiv xi G e`vcfci Avb I AvMh Znvej
mieivnKiv cZvbtK Rvbtbv/

GKv Av`kLvvi cwiKfvi AšPZ vevfoAa`vqi Zvij Kv vbtP cÖE ntjv

1/ mvi mst`c

K) e`emvqi aib

1. Drcw`Z `e`
2. m`te` evRvi
3. cZthvMZv

L) A_`msvšjZ`

1. cQvRbvq At`P cwi gvY
2. At`P cQvRfbi Kvi Y
3. Kxfvte e`qKZ.A_`di Z t`qv nte

2/ e`emvqi eYv

gvfQi Pvl I e`e`vcv

Kul. I cj Dbaqb ǰ

- K) e'emvqK cǒZǒvǰbi bvg
- L) Dnvi ǰfšZK Ae`vi eYǒv
- M) Drcv`Z cY` Ges Zvi gj`gvb ev`i ǰbaǰY
- N) H cǒZǒvǰbi BvZK_v
- O) e'emvǰqi j ǰ

3/ evRvi MǰelYv Ges cwi Kí bv

- K) mǰe` ǰμZv
- L) evRvi Rixc
- M) evRǰi i ǰe`ǰZ
- N) cǒZǰhMZvi Drmmgǰ
- O) ǰeμq Ges mi ei vn
- P) ǰeÁvcb I MbmsǰhM

4/ cwi Pǰj b

- K) Drcv`ǰbi c×vZ
- L) kǰgK thvMvb
- M) mi ei vnKvi x
- N) cǒqvRbǰq hšcvmZ
- O) mǰú` I mǰhM-mǰeav/

5/ cǰvb e`v³eM⁹(Key people)

- K) e`e`vcK ev e`e`vcK cwi I`
- L) kǰ`vbKvi x
- M) Avv_ǰ mrvqZv cǒvbKvi x
- N) evni vMZ ci vǰk⁹vZv ev mǰúthvi Y Kǰx⁹

6/ Avv_ǰ KǰǰP (Financing programme)

- K) A_ǰMǰi Kvi Y
- L) j MǰKZ.Aǰ_ǰ cwi gvY
- M) FY cwi ǰkva cwi Kí bv

7/ A_ǰvZK cwi Kí bv (Financial plan)

- K) evǰRU
- L) Avǰqi mǰe`Zv I cwi gvY ǰbaǰY

8/ mǰVK KǰǰP

9/ `ǰ⁹Zv Ges SǰK/

GKil ḡt̄Wj c̄k̄t̄i i c̄w̄Kiv c̄x̄w̄Z D`ni Ymn vb̄t̄P Av̄t̄j Pbv Kiv n̄t̄j v

c̄k̄t̄i i big t m̄ȳr̄ ȳKiv̄Lvgvi

mvi mst̄ŋc

Lvḡt̄i i msw̄ŋB eȲB̄v
w̄ t̄q mvi mst̄ŋc t̄j Lv̄i i
Ki t̄Z nq|

m̄p̄te` A_ŋM̄Kvix ev FY c̄l̄vb̄Kvix ms̄`vi `w̄o Av̄KĪŋYi Rb` mvi mst̄ŋc `Zwi Kiv nq Ges
GUv c̄K̄i c̄l̄ŋtei c̄l̄t̄gB Dc̄`vcb Kiv nq| GB Ask L̄ȳB msw̄ŋB Ges i aygv̄ŋ Aw̄Z
c̄l̄qv̄Rbxq Z_` mub̄t̄enkZ _v̄t̄K| Lvḡt̄i i msw̄ŋB eȲB̄v w̄ t̄q mvi mst̄ŋc t̄j Lv̄i i ȳKi t̄Z nq|
Gici Drcw̄`Z `ŋe`i eȲB̄v, m̄p̄te` t̄μZv c̄l̄Zth̄w̄M̄Zv BZ`w̄` w̄elq D̄t̄j- L Kiv nq|
met̄k̄t̄l c̄l̄qv̄Rbxq At_ŋ c̄w̄i gv̄Y, Kvi Y Ges Kx̄f̄r̄te Zv c̄w̄i t̄kva Kiv n̄te Zvi eȲB̄v _v̄K̄t̄Z
n̄te|

D`ni Y

ŋm̄ȳr̄ ȳKiv̄Lvgvi ŋ GKil Db̄Z̄ t̄c̄l̄Ub̄ Rv̄Ziq Lv̄` Drcv`b̄Kvix Lvgvi | GLv̄t̄b t̄`kx- w̄et̄`kx 5
ait̄Yi Kvc̄ŋv̄Q Drcv`b̄ Kiv nq| iŋ, Kvj̄Zv, ḡt̄Mj, ŋmj̄ f̄vi Kvc̄ŋ M̄m̄ Kvc̄ŋ Drcw̄`Z
gv̄t̄Qi ŋms̄n̄f̄iM̄ Av̄ḡiv `v̄bxq ev̄Rv̄t̄i w̄eμq K̄t̄i _w̄K̄ Z̄te w̄K̄Qȳw̄K̄Qȳgv̄Q `v̄bxq t̄i ōz̄i t̄U Ges
miv̄m̄vi Lvgvi t̄_ŋK̄ w̄eμq Kiv nq| eZ̄ŋv̄t̄b Av̄ḡiv`i c̄āvb̄ c̄l̄Zth̄w̄M̄x n̄t̄`Q c̄l̄Z̄tekx M̄t̄gi
ŋi f̄c̄vj̄x gr̄m` Lvgvi ŋ|

m̄ȳr̄ ȳKiv̄Lvgvi eZ̄ŋv̄t̄b c̄k̄z̄ ms̄`vi, gv̄t̄Qi t̄cv̄bv, mvi, gv̄t̄Qi L̄vevi BZ`w̄` t̄K̄vri Rb`
100000/- Uv̄Kvi c̄l̄qv̄Rb| `eĀw̄b̄K̄ Dcr̄t̄q gv̄Q Pvl Av̄ḡiv`i Lvḡt̄i Kg Li t̄P̄ t̄enk
Drcv`b̄ m̄n̄q̄Zv̄ Ki t̄e| ḡw̄ij K Ges FY c̄l̄vb̄Kvix ms̄`vi ḡt̄a` m̄eūw̄`Z P̄r̄e³ Ab̄h̄v̄q̄x GB
A_ŋc̄w̄i t̄kva Kiv n̄te|

Lvḡt̄i i eȲB̄v

mvi mst̄ŋc Dc̄`w̄c̄Z Z̄t̄`i w̄el` w̄eei Y I w̄et̄k- IY GLv̄t̄b w̄j̄ w̄c̄e x Kiv nq| c̄l̄t̄gB
Lvḡt̄i i big eȲB̄v Kiv nq| t̄K̄b GB big w̄ t̄q̄t̄Qb Zvi m̄p̄te` Kvi Y I Zvi m̄ȳēām̄gr̄ GLv̄t̄b
w̄j̄ L̄t̄Z n̄te| Aet̄k̄t̄l Lvḡt̄i i w̄e`Zwi Z w̄eei Y w̄ t̄Z n̄te|

D`ni Y

m̄ȳr̄ ȳKiv̄Lvgvi GKil
L̄vevi Rv̄Ziq gv̄Q
Drcv`b̄Kvix c̄l̄Z̄ōib|
eZ̄ŋv̄t̄b Av̄ḡiv 5 c̄l̄R̄w̄Zi
Kvc̄ŋv̄Q Drcv`b̄ K̄t̄i
_w̄K̄|

m̄ȳr̄ ȳKiv̄Lvgvi GKil L̄vevi Rv̄Ziq gv̄Q Drcv`b̄Kvix c̄l̄Z̄ōib| eZ̄ŋv̄t̄b Av̄ḡiv 5 c̄l̄R̄w̄Zi
Kvc̄ŋv̄Q Drcv`b̄ K̄t̄i _w̄K̄| Av̄ḡiv w̄b̄K̄U` mi K̄w̄i n̄v̄P̄wi t̄_ŋK̄ t̄cv̄bv μq K̄w̄i Ges
Av̄ḡiv`i Lvḡt̄i j̄vj̄ b̄ cv̄j̄ b̄ K̄w̄i | gv̄Q aivi ci t̄m_ t̄j̄v t̄M̄Uv̄ ŋm̄v̄t̄e w̄eμq Kiv nq| t̄cv̄bv
ḡR̄Z̄ t̄_ŋK̄ gv̄Q aiv ch̄š̄8-12 ḡim̄ mḡq̄ j̄v̄t̄M̄| gv̄Q j̄vj̄ b̄ cv̄j̄ b̄ h̄Lb Pj̄ t̄Z _v̄t̄K̄ ZLb
Av̄ḡiv`i c̄l̄Z̄ mḡq̄ Aem̄t̄i K̄v̄Ūt̄Z nq Ziv̄ Āw̄aK̄ ḡb̄v̄dv̄ AR̄ŋbi Rb` Av̄ḡiv gv̄t̄Qi m̄v̄t̄_
n̄w̄-ḡj̄w̄Mi Pvl̄t̄K̄ mḡw̄š̄Z̄ Ki t̄Z P̄v̄B| GB c̄l̄Ȳx̄ c̄k̄z̄i `Re mvi mieiv̄n̄ Ki t̄e hvi d̄t̄j̄
Av̄ḡiv`i m̄v̄t̄i LiP̄ K̄t̄ḡ h̄v̄t̄e| n̄t̄mi Rb` c̄l̄qv̄Rbxq kl` `v̄bv Rv̄Ziq L̄vevi c̄k̄z̄i i Av̄t̄k̄
cv̄t̄k̄ Pvl̄ Kiv th̄t̄Z̄ cv̄t̄i | A_ŋev̄ ev̄Rvi t̄_ŋK̄l̄ μq Kiv h̄v̄t̄e| n̄t̄mi c̄R̄bb̄ Av̄ḡiv Lvḡt̄i B
m̄eūb̄āK̄ie hvi d̄t̄j̄ ēw̄ni t̄_ŋK̄ μq e`q̄ Āt̄b̄K̄ Kḡ i v̄Lv̄ m̄ē n̄te|

Lvḡt̄i i Dch̄ŋ w̄el̄t̄qi eȲB̄v m̄eūb̄ēnt̄j̄ Lvḡt̄i Drcw̄`Z gv̄t̄Qi _bv_ Y I `vḡ w̄b̄av̄PY
c̄l̄μq/c̄x̄w̄Z m̄ēt̄x̄ Av̄t̄j̄ v̄K̄c̄v̄Z̄ Ki t̄Z n̄te|

Kul. I cj. Dbqb ֿֿ

D`vni Y

Avgiv thme gvQ Drcv`b Kwi tm,tjv ntjv iB, KvZjv, gMj, wj fvi KvcI MAm KvcI iB, KvZjv I gMj Avgv`i cAbv gvQ Ges wKQyv tenk `vtg Avgiv wemj Kti _wK/ cAbv Lv` nmvte Gme gvQ wemj Kiv nq|

Lvgv`i th nwn Drcw`Z nte tm,tjv Avgiv evRviRvZKiYi DcthvMx ntj `vbxq evRv`i wemj Kitev| hZqjb chSf wemj Ae`vnZ _vKte ZZqjb chSf vg Kgv`tbi tKiv cwi Kibv Kiv nte br|

G chf`q Lvgv`i BwZnm eYBv Kitz nte hvZ Avw`R cAzOb Lvgv`i cAwx m`fU avi Yv Kitz cv`i| G Astk Lvgv`i iij ZwiL, wMZ w`tb Bvvi jvfRbKZv Drcv`tbi I `vtgi cwi eZB Kvi Ymn Ges evRv`i MvZ cKwZ. D`j - L Kitz nte|

Lvgv`i eYBv tkl chf`q Lvgv`i j`q` D`j - L Kitz nte| j MvZ.A_`q`tk Kx cwi gvY jvf Ges Zv Kxfite ARB Kitz Pvb tmUv D`j - L Kitz nte| e`q Kgv`tbi, m`te` Drcv`b ewx, ktgi Dbz`i e`envi, Awkzi gbydv I evRv`i tkvvi BZ`w` w`lq GLv`tb `vb cv`e|

evRvi MtelYv I cwiKibv

evRvi MtelYv D`f`k` ntjv L`fi m`fU w`wvZ avi Yv tbqv Ges evRvi `Lj Kiv| Zte Avgv`i t`tk w`tkl Kti Kiv gv`ji t`q`f` G cxwZ Ac`qvRbxq| Kvi Y GLv`tb mvari YZ Lvgv`i Avtkciv`ki tjv`KivB ev wBKU` evRv`i L`fi MYB Lvgv`i Drcw`Z `e` m`q Kti _v`K| tm Rb` G t`q`f` Kx cwi gvY `e` Drcv`b Kitz nte tmUvB gL` w`lq wntmte w`tewPZ nte|

Lvgv`i cwi Kibv j`q` evRv`i `ewk`mgr D`j L Kitz nte| wba`f` Y Kitz nte Kx ai`tbi t`v`K Drcw`Z `e` m`q Kite| A_`qr t`m`zv mvari Yv m`q q`g`zv hv`v`v` K`i`B `e` Drcv`b Kitz nte|

Kxfite wemj Kv`m`uv`b Kitz nte Dnvl cwi Kibv D`j L _v`K`Z nte| thgb gvQ wK mivmvi wemj Kiv nte bwiK tKiv cvBKvix wemjzv ev Aviz`v`i Kv`Q wemj Kiv nte| Avevi Kxfite gvQ cwi enY Kiv nte Zvi I w`l` eYBv _v`K`Z nte|

w`Avcb msv`sf`tqi I GKwL LvZI qvi x wmvv cwi Kibv _v`K`Z nte|

cwiPj b

Kxfite Drcv`b Kv`m`gvav Kiv nte tm m`f`x w`wvZ w`ei Y wj w`ce`x _v`K`Z nte| th mg`l Kv`h` GLv`tb Aek`B D`j L Kitz nte Zv ntjv-

- 1) cKz` e`e`v`cbv cxwZ
- 2) tcvbv gvQ m`tqi ZwiL
- 3) gvQ aivi ZwiLmgr (KZevi aiv nte)
- 4) Avf`A` kig`tki c`c`Zv
- 5) tcvbv gvQ, h`scwZ Ges Lvevi mieivnKvix cAzv`tbi Ae`v`b/ `i`Zij
- 6) nvdv`Rs, t`v`v`i`R Ges Acv`i`w`S m`y`h`m`m`y`ari Zv`j` Kv

Lvgv`i cwi Kibv j`q` evRv`i `ewk`mgr D`j L Kitz nte|

câvb e`ir³eM

Lvgvi myi fite cwi Pj bv Kiv I `b`b Kvhfej x mōZvte m`uv`b Kivi Rb` th mKj gvbly RwoZ _vKte Zv`i m`utK`e`hwi Z Z` cwi Kí bvg wj uce× _vKtZ nte| cōZiU cāvb Rbetj i Rb` GKiu AbtjQ` wj LtZ nte thLvrb Zv`i AwfÁZv, `wqZ; wk¶lv, tckvMZ ev e`ir³MZ B`Qv/Awb`Qv cwi evt`i weeiY Ges Avil Ab`vb` Z` hv Aw_R cōZōrbtK Lvgvti wbhj Rbetj i mvg_¶hvPvB KitZ mnvqK nte|

KZmsL`K AbwFÁ klgK KZw`b ci ci cōqvRb nte Lvgviti KivR mgvav Kivi Rb` Zvi I GKiu weeiY _vKtZ nte|

e`e`vcK, KgPvix Ges klgKtK cō`q Aw_R mthvM mjevavI mme`li eYbv _vKtZ nte| Kx cwi gvY A`cōZRBtK cōZgvfm Ges eQti cōvb Kiv nte Zv`vbxq gvtj wj LtZ nte|

hw` ewni t`tK tKvb civgkRtK Wivv nq ZvtK cō`q At`P cwi gvYI cwi Kí bvg wj uce× _vKtZ nte| Aek` m`úthvi Y wefvMti Kgv¶v wbev cwi klgK mnvvh` mnthvMZv Kti _vtKb|

A`qpb KgmP

A`qpb Kgm Ptz GKRb e`emvqtK LvZ DtlLceR e`tqi cwi gvY wj uce× KitZ nte| `te`i `vg I cwi gvY/msL`vi GKiu Zvwj Kv mieivn KitZ nte| `e` μq I Ab`vb` LvZ e`tqi cwi gvY tgvU LiPi mvt` thvM KitZ nte| tKvb mgq mvKj` A`e` μq I mwf¶m mjevav eve` LiP Kiv DvPZ bq| me mgq wKQybM` A`¶vtZ tiL e`q m`uv`b KitZ nte| msiw¶jZ At`P cwi gvY h`_v`Zv DtlL ceR cwi Kí bvg wj uce× KitZ nte|

Aw_R cwi Kí bv

Lvgviti evtRU we`hwi Z fite Ges cwi`vi fite ev tevaMg` fite wj LtZ nte| Guv tUvej AvKviti wj LtjB tevk myi Ges eStZ mnR nte| hw` m`e nq weMZ eQi Ges AvMvgx eQti i e`tqi Zvwj Kv msv¶jB AvKviti wj uce× KitZ nte| GtZ m`e` jvf eSv hvte|

mveR KgmP Ges câvb KivR

Lvgvi cwi Pj bv mnR KitYi Rb` m`e nj msevmmi K KgmP/mgqmiP cōqb KitZ nte| grm` Lvgviti cāvb cāvb KvRi gta` gvtQi tcvbv μq Ges Lvgviti KZKvthP Rb` mnvqK Ab` tKvb SvkC¶v`K ev Amjevavi K_vl DtlL _vKtZ nte| mgqmiP cōqbtbi Dtlk` nt`Q Aw_R cōZōrbtK eSvrbv th KvRiU mPvi j¶c I msvwi Kwí Zfite tkl nte|

`¶v`w`K I Svk

G e`emvqtqi `¶v`w`K Ges Svkmg¶ cwi Kí bvg AšifZ Kiv ev gvgtbi KivR| Bnv weibtvMKvix cōZōrbtK Avevi I Av`~` Kite th Avcub GB e`emvU fvj eSb, Gi m`e` mgm`v m`šÜ Avcub cteB AeMZ AvtQb hvi dtj mgm`w` j Nk`i¶Yi KivR mnR nte| thgb-grm` Lvgviti i `¶v`w`K I SvkC¶v`K nt`Q t

- K) cōKwZK `¶h¶Mi Kvi¶Y gvtQi ¶wZ
- L) Zv Qvovl KZ`tjv mvari Y Svk _vtK thgb cōZthvMZvi nvi cwi eZB, mi Kwí bvxZ I AvBbKvbly cwi eZB BZ`w` |

Lvgvi myi fite
cwi Pj bv Kiv I `b`b
Kvhfej x mōZvte m`uv`b
Kivi Rb` th mKj gvbly
RwoZ _vKte Zv`i
m`utK`e`hwi Z Z`
cwi Kí bvg wj uce×
_vKtZ nte|

A`qpb Kgm Ptz GKRb
e`emvqtK LvZ
DtlLceR e`tqi cwi gvY
wj uce× KitZ nte|
`te`i `vg I
cwi gvY/msL`vi GKiu
Zvwj Kv mieivn KitZ
nte|

Kul. I cj Dbaqb ĩĵ



Ablyj b (Activity) t aily, Avciyb ūgŷv grm Lvgvi ō bvtg GKul cĀĪ Pij yĀiĵ B"QK | D³ cĀĪĪ cwiĀĪbv c×wZ m=utĀĪPŠ-v Kily I Zv LivZvq avivemĀĪfite wj Lly (Ablyj[©] 200 kĀ)|

Aw_R mnthwMZvi Drmmgr-

wewfbæAw_R cĀZōvb eZġvĵb grm Lvgvi ĩvcĵbi Rb Aw_R mnvqZv cōvb Kĵi _vĵK | wĵP KĵqKul cĀZōvĵbi bvg t`qv ntjv |

eisj vĵ`k Kul.e'isK

Kul.i Ab'iv` kvLvi cĀkvcwĀk grm Lvgvi cĀZōv/grm PĵĪi Rb eisj vĵ`k Kul.e'isK FY cōvb Kĵi _vĵK | G e'isK ĩfĵgqv`x, gaĵgqv`x I `xNġgqv`x FY wĵĵq _vĵK | ĩfĵgqv`x FY wĵĵq gvQ Pvl Ges gaĵgqv`x ev `xNġgqv`x FY wĵĵq grm Lvgvi cĀZōv Kiv hvte |

eWYiR`K e'isK

eWYiR`K e'isKmgri miKĵĪi wĵĵ`Āk Kul.KĵR I grm Lvgvi cĀZōvi Rb FY cōvb KĵiĵQ | G KĵR mnvqZv Kivi Rb wewfbæeWYiR`K e'isK grm wĵĵq `ġ I AwfĀ KgRZP wĵĵqM KĵiĵQb |

miKvi

miKvi cĀĪĪfite FY vb Kĵi _vĵK | mvaviYZ `wĵĵĪ, eb'v, Liv cĀwZ A_ġwZK `ĵhĪMi mgq miKvi miwmi FY cōvb Kĵi _vĵK | G FYĵK ZvKivx FY etj |

eisj vĵ`k RivZiq mgevq e'isK wj t

Kul.FY mi eivĵni tġĪĪ GiU , iZcYġFwġKv cij b Kĵi _vĵK | eZġvĵb Avġv`i t`ĵk Kul.FY mi eivnKivx wewfbæmgevq cĀZōvb iĵĵQ | G mKj mgevq cĀZōvĵbi gĵa` DĵĵĵthvM` ntjv |

K) eisj vĵ`k RivZiq mgevq e'isK

L) tK`ĵq mgevq e'isK

M) cōwġK mgevq mwġwZ

mgwšZ cj Dbaqb KgġP

mgwšZ cj Dbaqb KgġP Gĵĵki Kul.FĵYi GK , iZcYġDrm |

MġxY e'isK

G e'isK Kul.FY mi eivĵn , iZcYġFwġKv cij b Kĵi _vĵK | t`ĵki cĀĪš- AĀĵĵi fġwġxb cijy I gwĵĵvĵ`i FY cōvb Kiv ntjv Gi gĵ- Dĵĵk` |



Ablyj b (Activity) t aily, Avciyb GKul grm Lvgvi ĩvcĵbi Rb Aw_R mnthwMZv PĵĵQb | Gi Rb Avciyb tKiv tKiv cĀZōvĵbi wĵKU Kx aiĵbi mnthwMZv PĵBĵeb Zv hġ³ mnKĵi Dc ĩcb Kily |



cuVvEi gj`vqb 7.1

miWK DEti i cuK uK iPy (✓) i b|

- 1/ grm` Lvgvi cwi Ki bv c`vbZ tKb Kiv nq?
 K Znjej mi ei vtn AvMh mpo Kivi Rb`
 L Lvgvi mgfU AvfAZi ARB Kivi Rb`
 M FY cwi tkva mnR Kivi Rb`
 N FY MhY mnR Kivi Rb`

- 2/ tKvbU cwi Ki bri kZ`bq?
 K evRti i Ae`v
 L e`tqi cwi gvY ubafY
 M kigtKi cwi gvY ubYq
 N cKzi i AvMqv `gb

- 3/ tKvbU cwi Pj b KvRi Ašif?
 K Lvgiti i tFvZK Ae`v
 L evRi Rixc
 M `te`i gj` ubafY
 N Drcv`tbi cxvZ

- 4/ ZvKvfx FY tKvb&c`Z`vb c`vb Kti _vtK?
 K evsj vt`k e`isK
 L mgevq e`isK
 M mi Kvi
 N MvgY e`isK

cW 7.2 Rbej, hšcwZ I cwiKí bvi Ab`wb` cšveKmgšai meiy



G cW tkłl Avicb –

- GKilU grm` Lvgvi cKšfi i Rb` KZ aišbi Rbej `iKvi nq Zv Dšj - L KišZ cvišeb|
- weifbrRbetj i cšqvRbxq thvM`Zv Kx Zv vbt`R KišZ cvišeb|
- cKšfi i KvšRi Rb` Kx Kx hšcwZ `iKvi nq Zvi Zvij Kv %Zvi KišZ cvišeb|
- cKšfi `vcb I cwi Pvj bvi cšvb melqmgR Kx Kx Zv e`vL`v KišZ cvišeb|
- cKšfi i Kwi Mui mšve`Zv Kxfiše hvPvB I e`vcbv KišZ nq Zv eYDv KišZ cvišeb|



cKšfi i Rb` cšqvRbxq Rbej

grm` Pvl i mdj Zv gvQ I Rj vktqi vbcy e`vcbri Dci vbfšKvj | G Rb` Pvl thvM` gvšQi cšqvRbxq eim`vb mššÜ Rivri Rb` Ges D`Pešx nvi I D`P tetP `vKvi nvi ARšbi Rb` cšqvRbxq Dcv`vb mššÜ e`vcK Ávb I `šZvi cšqvRb ištšQ| Amig `ah`I gšbvthvM grm` Lvgvši i mdj Zvi Rb` Acvi nvhš cšqvRbxq `šZvi I cškvšYcšš Rbkvš i Afite AšbK grm` Pvl KgvšP e`Zvq chšwZ nq|

Amig `ah`I gšbvthvM grm` Lvgvši i mdj Zvi Rb` Acvi nvhš

gvQ Pvl Rbetj i cšvif`

weifbršfi i Kwi Mui Kgvš melq Avšj vPvri cšeb e`vcbv `šZvi Dci tenk šRvi š`qv evÁbxq| AšbK mgq grm` Pvl `š Kwi Mui i K`v vektI `ištšj mšš vetePbv Kišj I e`vcbri th gE` fvgKv ištšQ Zv fvev nq bv| `šZvi gta` cv`R` `vKšj I šš`ev epr th šKvb Lvgvi cwi Pvj bvi Rb` e`vcbv `šZvi cšqvRb AvšQ| G aišYi Rbetj i cškvšY `šfite š`qv thšZ cvši | thgbt th e`vš i gvQ Pvl fij AvšÁZv AvšQ ZvšK e`vcbv melšq cškvšY š`qv thšZ cvši | Ab`v šK hvij fij e`vcbri Ávb I `šZvi ištšQ ZvšK gvQ Pvl i Dci mšššB cškvšY š`qv thšZ cvši |

gvQ Pvl i Rb` cšqvRbxq Kwi Mui KgvšK tUKvbkqvb, gvrme` , šKvb vektI melšq vektI Á thgb dšy tUKšbvj vRš , vdk c`v`šj vRš ; Lvgvi cšKšKjx Ges grm` Pvl mšššvi Y vektI Á/gvrme` BZ`w` fšM fšM Kiv hvq| gvQ Pvl mniqK Rbetj i cvkvšvK gvQ veyšbi Rb` Rbej `iKvi nš| thšnZcššZv Lvgvši cššZv vektI melšq vektI Á vbtqvM Kiv A`šwZKfite jvšRbK nš bv ZvB Gme melšq mšvi Y šmev e`vi Avktš tbqv thšZ cvši | Zš `šš `š i grme` I tUKvbkqvb, e`vcbv Rbetj i cvkvšvK vbtqvM Kiv Acvi nvhš GB `šš `š i Rbetj šK Zvš i vkvšwZ thvM`Zv I cškvšYi Dci vbfš Kš Avš v`v Kiv nq|

gvrme` Kg cšš mššk-ó melšq MšRšqkb `vKšZ nš| thgb- me.Gm-vm., vdmvšR (Abvš) ev mgvšbi vWvMš Zvi D`PZI cškvšY `iKvi Kvi Y vZvš gvQ Pvl KgvšPi mKj melšq Z`vi Kx I AskMšY Kš `všKb| vkvšwZ thvM`Zv I cškvšY ZvšK gvQ Pvl i weifbrššš cšqvM KišZ Ges gvQ Pvl šKvb mgm`v š`Lv v`šj Zvi mgvšv v`šZ mniqZv Kite| cšqvRšb šKvb vektI ÁšK šWšK Avbri cšvgk`v šZ cvše| Zš cšvšZ vbcy tUKvbkqvb mniqZv ZvšK cšj v Drcv`b e`v Pvj jvLšZ nq|

Kul. I cj. Dbqb ž

GKRb tUKubikqv̄tbi cĕtqumK mel̄q meŋkl cĕkŋY _vKŋZ n̄e| tUKubikqv̄tbi cĕkŋY tKvb meŋkl mel̄qi Dci n̄Z n̄e| thgb- gvQ Pvl/ŋPsmo Pvl, n̄vPvni cwi Pvj b, Lvevi cĕZKiY, cĕž e'e-vcbv BZ"ŋ |

cĕtŋ i Rb" cĕqvRbq hšcŋZ

GKŋU grm" Lvgvi e'e-vcbv I cwi Pvj bvi Rb" ŋbŋe hšcŋZ cĕqvRb| thgb -

K) gvQ aivi Rb" Uvbr Rvj, SmK Rvj

L) gvQ ivLv I I Rb Kivi Rb" h_vŋtŋ evj ŋZ, ŋbŋe |

M) cĕž i cŋbŋZ Kx cwi gvY cŋŋUb (Plankton) AvŋQ Zv Rvbi Rb" cŋŋUb Rvj (cŋŋYR cŋŋUb Rvj I Dŋŋŋ cŋŋUb Rvj)

N) cĕž i cŋbŋZ Av ŋRb /M'vm mieivŋni Rb" G'vŋUi

O) Av ŋRb ŋgUvi

P) cŋb I gŋUi ci xŋŋvKiY KxU (water and soil testing kit)

Q) ŋcKAv, cŋbi ŋcGBP ŋgUvi BZ"ŋ | GQvov`i Kvi GKŋU AYŋŋY hšj

cĕtŋ -vcŋbi cĕb ŋelqmgŋ

K) grm" Lvgvi ŋbgŋYi Rb" Rŋg

L) Rŋg Dbqb/cĕž Lbb/Dbqb cŋb ŋeZiY ŋbŋkb bŋj v BZ"ŋ`

M) Ab'vb" AeKvŋŋgv : Avdm Ni /MŋŋŋW ,`vg Ni BZ"ŋ`

N) KŋUv Zvŋi i teor

O) AMfŋi bj Kc A_ev tj v-ŋj dU cvŋú

P) grm" PŋtI i hšcŋZ: Rvj, cvŋú, G'vŋUi, ŋbŋe, evj ŋZ, tU^aBZ"ŋ |

cwi Pvj bvi cĕb ŋelqmgŋ

K) cŋb ŋbŋkb

L) Pŋ cĕqum

M) cĕž i cŋo I Zj ŋ'k tgivgZ

N) Kŋŋŋŋŋ /`Re mvi

O) i vŋvŋbK mvi : BDŋi qv, ŋU Gm ŋc, cUvk

P) tcvb

Q) gvŋQi Lvevi : `Lj, Mŋgi fŋl, Kŋv, i'UKx gvŋQi ,ov

R) gvQaiv/evRvi RvZKiY

S) JIa/ŋPŋKrmv

T) Rbej

U) AvbŋŋŋK (ŋe`ž. Rvj vbx, gŋbŋix`e"ŋ)

cĕtŋ i KwiMi mŋe"Zv hŋPb

cĕtŋ i GjvKv ŋPŋZKiY t Af`šlixY mgZj fŋgi eb'vgŋ th tKvb GjvKv ŋgVv cŋbi grm" Lvgvi -vcb Kiv hvq|

gŋUi tŋZ ,Yv,Y t grm" PŋtI i Lvgvi ŋbeŋŋb t`vAvk Ges GŋUj gŋU DĚg, Gi Drcv`bkj Zv teŋk| ŋcU gŋU Ges teŋj gŋU cwi nvi Kiv DŋPZ| jvj gŋU Ges eŋi`^a AĀŋj i k³ gŋUi cĕž i Drcv`bkj Zv Kg|

ŋgVv cŋbi grm" PŋtI i Lvgvi ŋbeŋŋb cŋbi Drm ŋŋŋŋŋ tj ŋbvgŋ Ges ŋeŋŋŋŋŋ v³ M'vmgŋ cŋb DĚg|



cuVvEi gj`vqb 7.2

mW/K DEti i cuK uK vPy (✓) w b|

1| cKti i Rb` cavb tKvbWZb ai#bi Rbetj i` i Kvi?

- K) e`e`vcK, gvrme` I tUKubukqvb
- L) e`e`vcK, tUKubukqvb I Avi Z`vi
- M) gvrme`, tUKubukqvb I ubKvi x
- N) gvrme`, Avi Z`vi, tRtj

2| cuUv Rvj w` tq Kx ai v nq?

- K) gvQi tcvbr
- L) eo gvQ
- M) tcvKv gvKo
- N) AbxTY DvM I cYx

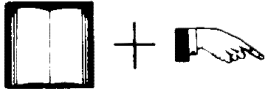
3| cKt`vc#bi Rb` Kx ai#bi gWU me#Ptq fij?

- K) tetj
- L) jvj
- M) GtWj
- N) b`xi PivAj

4| 1 (GK) tn±i wU Rj vqvZ#bi Lvqvi`vc#b Kx cuv gvY Rvgi` i Kvi n#e?

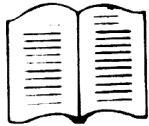
- K) 1.00 tn±i
- L) 1.25 tn±i
- M) 1.50 tn±i
- N) 2.00 tn±i

cW 7.3 Avq I e`tqi nmvei qY



G cW tk`l Avcib -

- nmvei qYi gjbmZ Ztj aiZ cvi`teb|
- w`i e`q I cwi eZBkj e`q Kx Zv e`vL`v KiZ cvi`teb|
- Kxfvte Avq e`tqi nmvei qY Kiv nq Zv eYBv KiZ cvi`teb|
- ti KW`Kxfvte i vLv nq Zv RvbtZ cvi`teb|



nmvei i qYi gjbmZ

nmvei qY GKU c`xvZ hvi gva`tg GKRb e`emvqx Zvi e`emv`tqi Avq I e`tqi wevfbae Drmmgr- kbr³ Kti _v`Kb| nmvei qY c`lqv Abjxj b mWk ti KW`msi qYi Dci vbfP Kti | mWk ti KW`msi qY Qvov nmvei qYi tKvb hv`ye`vB GKU e`emv`tqi j vFRbKZvi mWk vP` Ztj aiZ cvi`teb| vbfP ti KW`msi qYi Rb` GKRb e`emvqx mKj c`vB `xKvi c`I Rgv Ges Avq I e`tqi LvZqv vj vce`x KiZ nte| GKRb grm` e`emvqx Kxfvte nmvei qY Kiv m`ubaeKite Zv LvB mnR fvte Ztj aiv ntv| GtZ GKRb mvavi Y e`emvqxI e`stZ cvi`te Kxfvte Zvi e`emv`tq A_`Avmte Ges Kxfvte e`q nte|

nmvei qY GKU c`xvZ
hvi gva`tg GKRb
e`emvqx Zvi e`emv`tqi
Avq I e`tqi wevfbae
Drmmgr- mbr³ Kti
_v`Kb| |

Drcv`b ev`xi mvt_ thme
e`q ev`x Ges Drcv`b
nvtmi dtj thme e`tqi
nm NtU tm me e`qtK
cwi eZBkj e`q etj |

w`i e`q I cwi eZBkj e`q

th mKj Dcv`v`bi LiP Drcv`b ev`xi mvt_ mvt_ Acv`evZ` _v`K A_`ev Drcv`b hvB tnvK bv tKb th mKj Dcv`v`bi LiP Aek`B enb`thvM` ZvB w`i e`q| thgb gvQ KZUKzav ntv Ges wev`v Kiv ntv Zvi Dci th e`q vbfP Kti bv ZvB Gt`q`v` w`i e`q| c`kz` vbg`v` e`q, Rbetj i cwi klgK, c`vB hšc`vZ BZ`w` w`i e`q| Drcv`b ev`xi mvt_ thme e`q ev`x Ges Drcv`b nvtmi dtj thme e`tqi nm NtU tm me e`qtK cwi eZBkj e`q etj | thgb c`kzi m`ubaeK Lv` w`i Drcv`b evote mvt_ mvt_ e`q| evote|

Drcv`b Avq I e`tqi mgZv` Ges AvkU`qZ gjv`v

w`i I cwi eZBkj e`q c`v`bi Rb` th cwi gvY gvQ Drcv`b KiZ nq DnvB Drcv`b I e`tqi mgZv` v`y D`vniY`-tjc GKU q`z` grm` Lvgti i w`i LiP avi 100000 UvKv| Avil gtb Kvi wevfbae`k- IY I Ab`v` grm` Pvlxi mvt_ Avjvc Avtj vPbvq Rvbr hvq th gvQ AvniY mgq chš`v`Kvb GKU gvtQi Rb` cwi eZBkj LiP (m`ubaeK Lv` I LUKvj xb klgK) nte Dnvi `vtgi kZKiv 40 fM| A_`v` hvi GKU gvQ 100 UvKv wev`v Kiv nq Zvntj Dnvi cwi eZBkj LiP nte 40 UvKv| hvi D³ grm` Pvlx 100000 gvQ wev`v Kivi Avkv tcvY Kti Zvntj tgvU cwi eZBkj LiP nte 40000 UvKv|

Drcv`b e`q I Avtqi
mgZv` v`y D`vniY`-tjc
= w`i e`q +
cwi eZBkj e`q|

Drcv`b e`q I Avtqi mgZv` v`y D`vniY`-tjc = w`i e`q + cwi eZBkj e`q| GB mgv`Kiv cwi eZBkj e`q ntv Drcv`b e`q c`v`bi Rb` th cwi gvY gvQ c`lqvRb Zvi kZKiv 40 fM| GLb gvQ Pvlx hvi gjv`v KiZ Pqv Zvntj temk gvQ Drcv`b KiZ nte Ges Drcv`b Z gvtQi cwi gvY hvi Gi tP`q Kg nq Zvntj Zvi tvKmvb nte|

Avq I e`tqi nmvei qY

GKU tQv grm` Lvgti i Avq e`tqi nmvei qY c`v`v`x`Z vZvU Kjvg _v`K| me`evtgi Kj v`tg Lvgti i Kv`h`ej`x m`ubaeK Rb` `e` v`y I cwi klgK eve` th cwi gvY A_`e`q Kiv ntv`q Zv tv Lv nq| tdiZ c`v` gvQ I gj` nm RvBZ Kg AvqI GtZ Aš`v`y | ga` Kjvg GKU vbr` e`q wefv`mi Aš`v`y`h`v`M`dj t`Lv nq| tKvb vbr` o` mg`q Lvgti gR`v` gvtQi

Kul. I c j D b q b ǝ

tgvU gj "I GtZ t`Lvb nq| me©Wtbi Kj vtg tKvb ubw`θ wefvM ev DcwefvMmi mefkI
thvMdj t`Lvb nq|

GKuU grm` Lvgiti i GK eQti i Avq-e`tqi unmvei ¶Y cŵvj x D`vni Y mn ubtP t`Lvb ntj v t

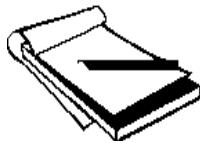
weµqj ä Avq (UvKiq)

weµq		147000
gj " nmm	3000	
Kg weµtqi dtj tdi Z gvtQi gj "	5000	
ubU weµq		139000
tePitKbv eve` Avq-e`q		
cKzi gRZ gvtQi AvbgmbK gj "		
(1j v Rvbgvix , 1995)		12000
tcvbv µq	33000	
Kg µtqi Rb" e`q nmm	500	
ubU µq		32500
weµqtthvM" gvQ		44500
cKzi Aemko gvtQi gj "gvb		14000
(Wtmt, 1995)		
weµµZe" gvtQi Rb" ubU e`q		30500
<hr/>		
tgvU ggvdv		108500
<hr/>		
cwi Pij b e`q		
weµq e`q		
K) weAvcb e`q	7000	
L) weµtqi Rb" cwi klgK	4000	
M) cwi enb e`q	8500	
N) weµea e`q	1200	
<hr/>		
tgvU weµq e`q		20700
<hr/>		

mvavi Y e`q (UvKvq)		
K) i qYvte qY e`q	2400	
L) m`ú i K Lv` eve` e`q	17400	
M) AePq (gj` nrm)		
e`q (`vj vb)	8000	
N) AePq (gj` nrm)		
e`q (hšcwmZ)	1500	
O) exgv e`q	3200	
P) mvavi Y thvMvb e`q	400	
Q) wevea mvavi Y e`q	200	
<hr/>		
tgvU mvavi Y e`q	33100	
<hr/>		
tgvU cvi Pvj b e`q		53800
<hr/>		
cvi Pvj b t`tK Avq		54700
<hr/>		
Ab`vb` Avq		
mÿ t`tK Avq	700	
<hr/>		
Ab`vb` e`q		
mÿ eve` e`q	4100	
<hr/>		
wbU Avq		51300
<hr/>		

Avq I e`q e`všf e`L`v

GB Avq e`všf i iyntqtQ Lvgti i meµj ä Avq t`tK hvi cvi gvY 147000 UvKv | gj` nrm I meµtqvEi tdi Z eve` gj` ev` w`tq DnvtK 139000 UvKvq avh`Kiv ntqtQ| eQtii i ištZ Lvgti 12000 UvKvi gvQ gRž wQj | 33000 UvKvi gvQt i tcvbv 500 UvKv Ktg tKvb n`vPwi t`tK µq Kiv ntqtQ| cte`gRž gvQt i gj` 12000 UvKvi mıt_ bZb µqKZ.gvQt i gj` 32500 UvKv thvM Kwi t j eQtii i ištZ 44500 UvKvi gvQ gRž _vtK| eQtii tkł meµtqi Rb` gvQ aivi ci cKž 14000 UvKvi gvQ Aewkó itqtQ| Gŕtb Lvgti t`tK 30500 UvKvi (44500-14000) gvQ meµq Kiv ntjv 139000 UvKvq hv ntZ 108500 (139000-30500) UvKvi tgvU gÿvdr ARb nq| meµq e`tqi (20700) mıt_ mvavi Y e`q 33100 UvKv thvM Ki t j tgvU cvi Pvj b e`q nq 50800 UvKv| tgvU gÿvdr t`tK cvi Pvj b e`q ev` w`tj cvi Pvj b t`tK (108500-53800) 54700 UvKv Avq nq| mÿ Avq (700 UvKv) I e`q (4100 UvKv) 54700 UvKvi mıt_ thvM A_ev meµqM Ki t j H ermti i Rb` wbU Avq 51300 UvKv cvl qv hvq|



Abloj b (Activity) t aily, Avcbvi GKwU grm` Lvgti AvtQ| D³ Lvgti i 2 (B) eQtii Avq I e`tqi nmie Kily (Kiv`wbK)|

tiKW`nsi qY

cłZw` tbi tiKW`ivLv Lvgti i m`ú` i Review`wZvi Rb` Acwi nvh` KtqK wgvU e`q Kti tiKW`ivLv GKwU grm` Pvl e`emv`ti gj`vq`tbi Rb` cłqvRbxq Z` mi ei v n , iaZcY`FvgKv cij b Kti | Lø Fij fivte tiKW`ivLštZ ntj GKwU dg`Zwi Kiv` i Kvi | wbtP D`vni Ymıfc Gi/c GKwU dtgP bgÿv t`qv ntjv|

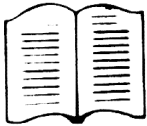
wbK cvi Pvj b e`tqi tiKW` wj j)

Zwi L	cKž	AvBtUg/	cvi gvY	GKK gj`	tgvU e`q
	bs-	Kivh`g			

Kul. I c j Dbaqb ǝ

-	1	Lv'' ugk	10 tKwR	30	300UvKv
-	1	mvi ('Re)	2 gY	20	40 UvKv
-	1	mvi (i v m v q u b K)	10 tmi	10	100 UvKv
-	1	kigK (Lv'' I mvi c@qitMi Rb')	3 gvbe NvUv	10	30 UvKv

Ab'vb'' c'vb Dbaqbj-K KvR Ges Lbb msvš'KvRi Rb'' dig 'Zwi Kiv thZ cvti |



mvi gg ǝ mvei ǝY GKwU c x w Z hvi gva'g GKRb e'emvqz Zvi e'emvqzi Avq I e'tqi
 wevfbaeDrm mgr- kbv³ Kti _v'Kb| wbf' ti KW' msi ǝYi Rb'' GKRb e'emvqzK mKj
 c'vB' x'Kvi c' Rgv Ges Avq e'tqi LuZqvb wj wce x KiZ nte| Lvqv' i i Avq e'tqi
 mvei ǝYi t'ǝt' wevfbaeLv'Zi Avq I e'tqi cwi gvY Q'K c'KvK Ki'j m'ear nq|



cvřVřĚi gj`iqb 7.3

miřK DĚřti i cvřk řUK řPř (ř) ř b|

1/ řnmve i řřY cřřřZi gvařtg GKRb e`emřqx Kř Kři?

- K) Ařq I e`řqi řeřřbřřřmřgř mbr³ Kři
- L) Ařřqi cřř gřY řnmve Kři
- M) řeřřřZ Ař`ř cřř gřY řnmve Kři
- N) e`emřřqi j řř řř řřKřmb řnmve Kři

2/ řKřbře`qřř cřř eZřkřj?

- K) cřřř ms`ři
- L) řřř řřř
- M) mřřřřK Lřřř
- N) Ařřř ÷ řřř řřř řřř

3/ GKRB e`emřqx Zři e`emř nřZ KLb j řř cřře?

- K) Dřcř`b Ařq I e`řqi mřZř ře`řř Aeř`Z gřř` řeřř Křřř
- L) Dřcř`b Ařq I e`řqi mřZř ře`řř Aeř`Z gřř`i řřř řeřř gřř` řeřř Křřř
- M) mřZř ře`řř Aeř`Z gřř`i řřř Křř`řř řeřř Křřř
- N) řeřř gj` cřř eZřkřj LiP I řřř Liřři mřř nřř

4/ řKřbřř řřř e`q?

- K) gřřř Li``Zřř i e`q
- L) cřřř řeřř e`q
- M) gřř eřřř RřřZKřřř e`q
- N) řřř řřř řřř řřř

tfivBiu, miv eQi ati gvQ mieivn BZ`w` KvhPtgi grvtgl cv`R`MZ mjev ARB Kiv thtZ cvti |

GLb Avgiv t`mL GKRb Prlx Ggb GK AA`tj gvQ mecyb Ki te thLvtb gvQoi Pinn`v Kg | Gt`ttZ ZvtK Zvi cY` m`fU tmuZv`i gta` cU`ugK Pinn`v mup Ki tZ nte | cU`ugK Pinn`v mup j`f` D`f`v`v tmuZv`i eSvZ cvti th gvQ Lv`` inmvte LgB fij I DcKvix | gvQoi c`y` gvb LgB D`f` gvQoi `f` I fij | ZvQov kixii c`y` mva`bi Rb` cWYR Avig | inmvte gvQ Ab`Zg | gvQo` qWZKviK `Zj RvZiq c`v``thgb tKvtj`toi j Kg `vtK ev `vtK bv | tmuZv`i KvtQ c`Y`i MhYthvM`Zv `Zvi KivB Gt`ttZ cU`g Kvr | tmRb` c`f` c`f`v`bv PrjvtZ nte Ges cU`qvRtb `vg Kvgtg w` tZ nte | tmuZv`i mevf`b`f`te ivbe evbe Kiv gvQ cwi`tekb Kiv thtZ cvti | cU`tg Drcv`bKvix Zvi c`Y`i MhYthvM`Zv `Zvi Ki te Ges c`ti Ab` c`Y`i t`tk cv`R`MZ mjev ARB Ki te |

meCYb v`kY

meCYb KvhPtgiK PrvU fvtM fVM Kiv hvq | thgb- DbwZ eab, gj`` uba`f`Y, meZiY I cY` | Gt` i`k GKtI meCYb v`kY etj | Gmtei cU`Z`Kiu mgvb , i`f`c`Y`Ges GKiu DrKI`Zv ev KivKvixZvi Afve cwi j`v`jZ nte me`tj`vB c`f`weZ nq |

meCYb KvhPtgiK PrvU fvtM fVM Kiv hvq | thgb- DbwZ eab, gj`` uba`f`Y, meZiY I cY` | Gt` i`k GKtI meCYb v`kY etj |

evRvi cWvi (Promotion)

DbwZ eab ej tZ Z`` mieivn, cU`q Drcv`b Ges `vi Kvj`w` cU`vb eSvq | teuki fVM t`ttZ meAvcb I c`f`v`i gva`tg DbwZ eab ev Drmvn eaf`bi KvrU Kiv hvq | Zte` q`z`Prxi t`ttZ G c`x`Z cU`hvR` nq bv | teuk j`v`mM c`x`Zi gta` `vbxq`f`te Ugrm` w` emU` D` hvcb Kiv thtZ cvti, th w` b GKiu `w`v`v` g`f` gvQ me`muq Kiv nte | Ab`f`te gvQ tmuZv`i nvtZ tj Lv KzY t`qv thtZ cvti | G me KzY GKiu `w`v`v` msL`K nte D`³ tmuZv`K Kg g`f` ev mevg`f`j` `w`v`v`v` cwi gvY gvQ t`qv nte | Gme KzY tQvU AvKvti i meAvcb I t`qv thtZ cvti |

teuki fVM M`f`gi nvtU ev tQvU kn`ti `vbxq cU`v Abyv`f`i gj`` uba`f`Y Kiv DvPZ |

`vg uba`f`Y (Pricing)

teuki fVM M`f`gi nvtU ev tQvU kn`ti `vbxq cU`v Abyv`f`i gj`` uba`f`Y Kiv DvPZ | mvari Yf`te ej tZ t`ttZ `vtgi w`v`v`v`cKv Pinn`v (`vtgi Af` cwieZ`b Pinn`vi e`v`cK cwieZ`b), Av`v`v`v`cK Pinn`v (`vtgi cwieZ`b Pinn`vi tZgb tKvb cwi eZ`b NUvq bv) A`ev GKK Pinn`v (`vtgi cwieZ`b Pinn`vtK m`u`Y`f`te meci`xZg`x c`f`ve t`ttZ) `vKtZ nte | Pinn`vi ZxeZv I cU`v`cK c`Y`i Dc`tiB mvari YZ `vg uba`f`iZ nq | gvQoi gZ GKiu c`v`b Lv`` c`Y`i mvari YZ w`v`v`v`cK Pinn`v `vtK |

gvQoi gZ GKiu c`v`b Lv`` c`Y`i mvari YZ w`v`v`v`cK Pinn`v `vtK |

`vg uba`f`iYi KtqKiu avi Yv

1/ c`f`ve me`li Kvix / Aby`f`ek Kvix `vg uba`f`Y (penetration pricing)

G c`x`ZtZ evRvi `L`ti Rb` Kg g`f` cY` me`muq Kiv eSvq | eo kn`ti Av`k cv`k Aev`Z eo Lv`vi G e`e`v` MhY Ki tZ cvti | Kg `vtg me`mu Kivi Rb` th cwi gvY j`vf Kg nq teuk cwi gvY cb` me`mu nI qri dtj Zv c`v`tg hvq |

2/ ubq`f`Y Kvix `vg uba`f`Y (Leader pricing)

bZb tKvb cY` ev me`tmuZv`K cwi`vPZ Kivi Rb` mvari`f`i t`ttZ Kg g`v`v`v`v` cY` me`mu Kiv`k ubq`f`Y Kvix `vg uba`f`Y eSvq | GB Kj v`kK`kj Lv`vi `v`ctbi cU`g w` tK Abyv`i Y Kiv nq |

3/ ģ kvkj KiY (Price living)

neifbægvQ neifbæġtg neġu Kiv hvġZ GŪv eſiv hvq th GB ġtgġi cv_ġK" cġY"i ġ Yv_ġYi cv_R" @úo nq| hLb tKvb gvQ Pvlx neifbæcRmZi gvQ Drcv`b Kġi ZLb tgvU neġuġi cwiġvY evovġbvi Rb" tm tKvb šbiv`Ŧ gvQġK GKšU šbiv`Ŧ ġ Yv_ Y ġkYġZ AſfŦ Kite| GKb ġtg me ġkYxi gvQ neġu Kiġj hLb tKvb tġZvi cQġ`i gvQšU neġu nġq hvq ZLb tm AZšġZ tfvġM| th gvġQi Pmġv`v teġk tm gvQ teġk ġtg neġu nġqvi thvM`| neifbægvQ neifbæġtg neġu Kiġj tġZvġ`i eſġZ nġe th šbiv`Ŧ cwiġvY Aġ_P neġbgġq Zvi v tKvb gvQ cvġ qvi thvM`|

th gvġQi Pmġv`v teġk tm gvQ teġk ġtg neġu nġqvi thvM`|

th šZbšU cġšZġZ gvġQi ġvg šbafġY Kiv nq Zv šbġæcŦ Ē nġj v t

1/ LiP thvM ġvg šbafġY

ġvg = (tgvU šv`i e`q + tgvU cwi eZġkj e`q + AšfšġB e`q) / cġY"i BDšbU

GB cġšZġZ ġvg šbafġY Kiv mnR šKſ` ZvġZ tġZvġ`i Pmġv`vi e`vcvġU cġZdġj Z nq bv| gvQ Pvlx hv` šbġR evRvi ġK šbqſY KiġZ cvġi ZLb GB cġšZ Aġyġi Y Kiv thġZ cvġi |

2/ ġj` eġġ neġeġPZ ġvg šbafġY

ġvg = (tgvU Drcv`b e`q) / (100 - ġj` eġġ %) × 100

hLb tKvb Pvlx tKvb gvQ neġu Kġi šbiv`Ŧ cwiġvY ġbġdv tġZ Pġq ZLb G cġšZ Aġyġi Y Kiv nq|

3/ Pmġv`v-neġqM ġvg šbafġY

mġeġP Drcv`b e`q = [(ġj` × gvġQi mſL`v) - AvKšOġZ ġbġdv] / G ġK ġvg eġġi nvi mġġ cġKvk Kiv hvq|

mġeġP e`emġq (Merchandise) e`q = ġvg × [(100 - ġvg eġġ %) / 100]

GKRb gvQ Pvlx Zvi Drcv`Z gvġQi Kx ġvg cvġe ZvġK KvġR j vMġbv nġQB GB cġšZi mġeġRbK šv`K| thġb tKvb Pvlx GK ġKšR I Rġbi 2000 gvQ Drcv`ġbi Avkv ivġL Ges eZġġb evRġi cġZ tKšR gvġQi ġvg 100 švKv| Pvlx Zvi G mg`ġgvQ neġu nġZ 50000 švKv ġbġdv tġZ Pġq| mġZivſ Zvi mġeġPP Drcv`b e`q nġe 150000 švKv [(2000 × 100) - 50000] švKv| hv` Drcv`b e`q eġġ cvq Zvġġ ġm eġġ cġB Ask gvQ Pvlxi ġbġdv t_ġK ev` hvġe|

weZiY (Distribution)

weZiYi c0qvRbxqZv wbfP Kti grm` Lvgv`ii AvKvi, evRv`ii c0c`Zv Ges H me evRv`i gvQ tcvRv`bi Rb` cwi enb e`e`vi c0Z`Zv BZ`w`i Dci | weZiY n`Q LgB c0KwUK`ij e`e`v hvi Dci wbfP Kti GKw Lvgv`ii AvKvi | hw` Drcw`Z gvQ`i evRvi bv`_vtK Zvntj nvrvi nvrvi gvQ Drcv`b tevKvgx nte|

gvQ Pvlx hw` wbfRB weZiYi `wqZ; M0Y Kti Zvntj ZvtK wbfw`LZ w`lq`_tjv wetePbvq ivL`Z nte

- 1) Zvi wK Drcw`Z cY` mieiv`ni Rb` c0qvRbxq `qZv I e`e`v AvQ?
- 2) Zvi wK c0qvRbxq hibeinb mtqi Rb` AwZwi 3 At`P msKjvb AvQ?
- 3) Zvi wK GB bZb I AwZwi 3 KvRi Rb` chfB mgq nte? A_ev Zvi wK tKvb e`w`3tK G KvRi Rb` wbtqvM `v`bi c0qvRbxq A_ AvQ?
- 4) Zvi Gj vKvq wK Pw`3 wfiE`Z tbqv`i Rb` cwi enb e`e`v AvQ?

weCYb wgtYi mefkl
w`lq n`Q cY`|

cY` (Product)

weCYb wgtYi mefkl w`lq n`Q cY`| gvQ Drcv`bi Rb` th w`wqv` kjx, e`e`vcbv I cwi Phf K_v evj nq Zvi D`i`k` n`jv Ggb gvQ Drcv`b Kiv hv mn`RB wew`w Kiv hvq| GKRB cwi ktx gvQ Pvlx Zvi ktx w`tq Ggb`_Yv`_Y m`ubwgvQ Drcv`b Kite hv weCY`bi Ab`vb` KvR`K mnR Kti t`te| Drcw`Z gvQ fiv bv`ntj evRv`i w`tK`_vK`Z LgB K0 Ki`Z nq|

GKRb cwi ktx gvQ Pvlx
Zvi ktx w`tq Ggb`_Yv`_Y
m`ubwgvQ Drcv`b Kite
hv weCY`bi Ab`vb`
KvR`K mnR Kti t`te|

evRv`RvZKiYi aic

gvQ`i ev Ab` th tKvb cY`i weCYb wZb`w av`c m`ubwng | thgb -

- 1) evRv`i Abg`lek Ges c`fve w`li t Afv`bxq `vg w`baf`Y, weZib Ges Dbw` ea`bi gva`tg wew`w evov`bv|
- 2) evRv`i c`hvi t bZb bZb evRv`i bZb bZb e`eniv`i m`jwM KvR`j w`mtq wew`w cwi gvY evov`bv|
- 3) cY`i Dbq`b t GKw c0Y` cY`i mvt`_ mvt`_ bZb bZb cRw`Zi/Rv`Zi gvQ Drcv`b|

weCYb eLwM (Marketing tips)

1) cY`i mvariY Pwv`v epx`i Rb` c0tg tbZ`Ej`tkYxi e`w`3i g`bv`thwM AvKl`P Ki`Z nte| G ait`bi e`w`3 nteb Zviv hv`i mvgw`RK gh`v, c`fve c0Z`c`E I mvgw`RK tKvb e`vcv`i teik Avb`_vtK|

2) tμZviv me mgq th w`PtYi (e`v`v`U`i) cY` teik wKtb I teik c0` Kti Dnvi`_Yv`_Y A`q`b`et`i`L mieiv`n Ki`Z nte| me mgq tKvb mtqi c0Z` tμZvi S`wK Kgv`bi Rb` tP0v Ki`Z nte|

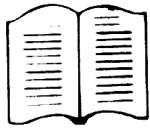
i`aycwi`ent`bi Rb`
c`v`Kw`Rs bv` Kti Dnvt`K
weAv`ct`bi gva`g w`nmt`el
e`eniv`i Kiv th`Z cv`i |

3) c`v`Kw`Rs (Pakaging)t c`v`Kw`Rs hw` Kiv nq Zvntj Dnvi e`eniv`i evov`Z nte| i`ay cwi`ent`bi Rb` c`v`Kw`Rs bv` Kti Dnvt`K weAv`ct`bi gva`g w`nmt`el e`eniv`i Kiv th`Z cv`i | evRv`i`K wev`fb`e`Ast`k we`f`3 Kivi Rb`I c`v`Kw`Rs KvR`j w`mt`bv th`Z cv`i | thgb- tKvb c`v`K`tU GKw gvQ (GK e`w`3 mivBR) ev` tKvb c`v`K`tU GKw`K gvQ (d`w`g`w`j mivBR) BZ`w` |

Kul.1 cju Dbqb 7z

4) weZiY t hwi weZiY I weptqi mgmiv nq Zvntj cvBKvix wepmZvi mrvnh" tbqv thtZ
cvti | cvBKvix wepmZvii weptqi 7zvi Kgrintmte KvR Kti wecytb mrvqZv Kti _vtK/
cvBKvix wepmZvii teik cwi gvtY gvQ wKbte ZvB GKmvt_B gvQ aiv thtZ cvti | cvBKvix
wepmZvii mrviiYZ evKvtZ cY" mq Kti Ges ctYi Pwi, t=vtiR ev bo ntq hvl qvi 7wZi
Suk wbtq _vtK |

5) cwi klgK cwtvbi evcvti bZb wKQyPSh fvebr Kiv thtZ cvti | thgb wepmi Dci
KgrK Kvgkb w tj tKvb Kgrteik Drmvtn KvR Kite |



miigg gvbj/i Pwrv I Afitei mšhno wbaftiYi Rb" weibgg cwtvbi gva'tg cwi Pwv Z
mKj gvboxq KvhggtK wecyb ejv nq | GKwU grm" Lvgti i mdj Zv Lvgti Drcw" Z gvtQi
h_vh_ evRviRvZKiYi Dci wbfPkj | h_vh_ evRviRvZ KiYi Rb" evRvti Abgdek I
cfve we'li, evRvi cwtvbi I ctYi Dbqb BZ"m" avcmgr-AbviiY Kiv Avek"K |



cvVvEi gj`iqb 7.4

mWk DEti i cvk Wk Py (✓)w b|

1/ grm" evRvi RvZKiY ej tZ Kx eSvq?

- K) gvQ weμq Kiv
- L) weibgq cμqvii Rb" cwi Pwjj Z mKj gvbeiq KvhPig
- M) gvQ μq Kiv
- N) gvQ cμqvRvZKiY

2/ evRvfi cv`R`MZ mjev Av`vqi Rb" tKvbW mrvqK bq?

- K) D"P weμq gj`
- L) D"P , Yv, Y m`ubagvQ
- M) weifbæZivRv gvQ
- N) Dbæzi mieivn

3/ wecYb wgvkY ej tZ Kx eSvq?

- K) KtqKw evRvfi i mgvivi
- L) KtqKw cY`i wgvkY
- M) KtqKw KvhPitgi wgvkY
- N) KtqKw Lvgti mgvivi

4. `vg kv³kij xKiY ej tZ Kx eSvq?

- K) `vg ewxKiY
- L) `vg nwmKiY
- M) Kvgkb c`vb
- N) weifbagvQ weifbæ`vfg weμKiY

- 6/ A_ %wZK cwi Kí bvi
K) ev#RU ei v`i
L) AbvgZ Avq
- 7/ mmeR KgmP I c`vb c`vb KvhPig
- 8/ `gZv I Sdk
- 9/ Z_ `b#`R



Ppivšgji`iqb

msm`B I iPbvgj-K c`æ

- 1/ grm` Lvgvi tKb `vcb Kiv nq Zv e`vL`v Ki ly|
- 2/ grm` Lvgvi cwi Kí bvi D`Í k` Kx Zv wj Lly|
- 3/ Kxfvte grm` Lvgvi cwi Kí bvi Ki teb Zv eY`v Ki ly?
- 4/ evsj v`k grm` Lvgvi `vctbi Rb` tKvb&tKvb&Avw`R c`Z`vib FY c`vb Kti `v`K Zv`i biv wj Lly|
- 5/ grm` Lvgvi `vctbi Rb` c`qvRbxq Rbetj i thvM`Zv I AvfÁZv wj Lly|
- 6/ grm` Lvgvi cK`í i Rb` `i Kwi hšçwZi Zvwj Kv w` b|
- 7/ GKwU grm` Lvgvi `vcb I cwi Pvj bvi c`vb w`l qmg`ni biv wj Lly|
- 8/ cK`í i Kwi Mwi m`veZv Kxfvte hvPvB Ki teb Avtj vPbv Ki ly |
- 9/ wnmvei `j`Yi msÁv w` b| tKb wnmvei `jY Kiv nq?
- 10/ w`i e`q I cwi eZ`kxj e`q ej tZ Kx eSvq D`vni Ymn wj Lly|
- 11/ GKwU grm` Lvgv`i Avq I e`tqi wnmvei `jY Kxfvte m`vb`Kiv nq D`vni Ymn wj Lly|
- 12/ evRvi RvZKiY ev w`cYtbi msÁv w` b |
- 13/ cv`R`MZ m`eav ej tZ Kx eSvq? Kxfvte Avcib cv`R`MZ m`eav tctZ c`tib Avtj vPbv Ki ly |
- 14/ w`cYb w`kY ej tZ Kx eSvq? w`cYb w`k`Yi Dcv`vb_ tjv mst`jtc Avtj vPbv Ki ly |
- 15/ `vg w`baf`Yi c`wZ_ tjv w`K w`K Zv eY`v Ki ly |



D`Eigjv

cvW 7.1

- 1/ K 2/ N 3/ N 4/ M

Kul. I cjb Dbqb q

cW 7.2

1/ K 2/ N 3/ M 4/ L

cW 7.3

1/ K 2/ M 3/ L 4/ L

cW 7.4

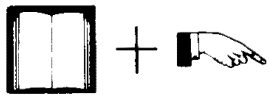
1/ L 2/ K 3/ M 4/ N

BDubU 8 wełki wełki gvQ Pvl

evsj vť`tki AvbrťP KivbrťP Qmoťq uQuťq AvťQ AmsL` ex Rj vkq| h_v- cłkž, tWvev, w`wN BZ`w` | GQvovl iťqťQ AmsL` Ljv-wej, b`-b`x, cłeb fvg, nvl o, evl o BZ`w` DbťR Rj vkq| AťbK ex Rj vkťq eQti gvĀ 4 t_ťK 5 gvm cwb _vťK thLvťb iB, KvZj v, gťMj, Kwj evDm BZ`w` gvQ Pvl Kiv m`e bq| uKŠ`weťkl KZ,ťjv gvQ th,ťjv` R eaBkxj Ges I `f RvqMvq Awak cwi gvťY Pvl thwM` thgb- _vB micłj, tZj wcvv, newfbewRIj gvQ BZ`w` D³ Rj vkťq Pvl Kiv m`e| Ab`w`ťK DbťR Rj vkq,ťjv e`e`vcbvq Amgavri KivťY wbio gvQ Pťli Avl Zvq Avbr m`e bq| Zte Gmg`l Rj vkťq AvabK cłw`ťZ gvQ Pvl thgb- tctb gvťQi Pvl, Bwj k gvQ Dbqab I e`e`vcbv Kiv m`e|

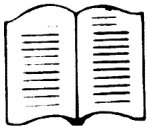
G BDubtU cłkži _vB micłj, tZj wcvv, gv, i I wRIj Pvl, tctb gvQ Pvl I e`e`vcbv, Bwj k gvQ Dbqab I e`e`vcbv wełťq we`wi Z Avťj vPbv Kiv nťqťQ|

cw 8.1 cłkži _vB micłj, AwdKvb gv, i, tZj wcvv I wRIj gvťQi Pvl



G cw tktl Avicb –

- Kxfvte _vB micłj Pvl Kiv hvq Zv RibťZ cviťeb|
- tZj wcvvi Pvl c`wZ eYBv KiťZ cviťeb|
- Kxfvte AwdKvb gv, i Pvl Kiv hvq Zv Avťj vPbv KiťZ cviťeb|
- Kxfvte wRIj gvQ thgb- t`kx gv, i, uks I KB gvQ Pvl Kiv hvq Zv eYBv KiťZ cviťeb|



evsj vť`tki AvbrťP KivbrťP Qmoťq AvťQ AmsL` cłkž, tWvev I Rj vkq| Gme Rj vkťq AwZ mnťR gvQ Pvl Kiv hvq| gvQ PvlťK Rbıclj Kivi jťŃ` bıbwea cłPov PjťQ| Aı RvqMvq Aı LiťP Awak Drcv`b cvl qvB Gi c`vb j`Ń`| G KivťY Pvl thwM` t`kxq cRwZi gvťQi cikvcwık newfbangťq` R eaBkxj RvťZi gvQ G t`tk Avg`wb Kiv nťqťQ| GLb mdj fite Gme gvťQi Pvl ver` nť`Q| G,ťjvi gťa` ivRcłj, tZj wcvv Ges AwdKvb gv, i, wj fri Kvc, Mm Kvc, weMtnW, eov Kvc, KwvcP BZ`w` cRwZi gvQ Dťj L thwM`| wťP KťqKw weť`kx I t`kx cRwZi gvťQi GKK Pvl c`wZ m`úťK Avťj vPbv Kiv nťj v|

ivRcłj ev _vB micłji Pvl

ivRcłj GKw` R eaBkxj mýř` ygvQ| `wŃY ce`Gukqvi newfbet`tk Gi Pvl Kiv nq| G gvQuťK MZ 1977 mťj _vBj`vU t_ťK evsj vť`tk Avg`wb Kiv nťqťQ| G Rb` Gw` _vB micłj brťg cwi wPZ|

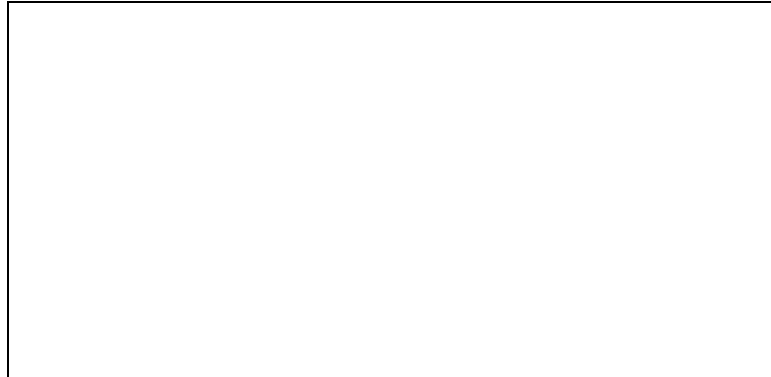
ivRcłj Pťli mgyav I , Yejx

- ivRcłj D`Pd j bklx I mýř` ygvQ|
- n`vPwiťZ mnťR G gvťQi tcvbv Drcv`b Kiv hvq|
- G gvťQi tiwM ej vB Kg|
- tQvU eo me i Kťgi tWvev, cłkž, w`wN I cwi Z`v³ Rj vkťq G gvQ Pvl Kiv m`e|
- Zj bv g j-Kfıte Aı mgťq mř` eťq mnťRB G gvQ Pvl Kiv hvq|

ivRcłjťK 1977 mťj
_vBj`vU t_ťK
evsj vť`tk Avg`wb Kiv
nťqťQ|

tQvU eo me i Kťgi
tWvev, cłkž, w`wN I
cwi Z`v³ Rj vkťq G gvQ
Pvl Kiv m`e|

- G gvQ cġq meai tbi cġKwZK Lv` MhY Kti Zte 9jz`Rj R Dv`G Gt` i ucġ Lv`
- 6 (Qq) gvfm GKwU i vRcW 100 t`tK 150 Mġg I Rb nq Ges evRvi RvZ Kivi Dc`thvMx nq|



uPĪ 64 t i vRcW

cġz ubePb I cġwZ

tQvU eo th tKvb AvKvtii cġzi G gvQ Pvl Kiv hvq| Zte 10 kZvsk t`tK 1 GKi AvKvtii cġz nj fij nq| cġzi Mfxi Zv 1.5 t`tK 2 uqUvi nI qv DvPZ| tgSmgx Ges evrmwi K G`ġai tbi cġzi B i vRcW Pvl Kiv hvq|

cġz i wKtq wKsev i Kvtbv m`e bv nj cġz kZvstK 30 tm.ug. Mfxi Zvi Rb` 30/35 Mġg tivUbb cġqvm Kti i vġtm Ges AewwAZ gvQ I tcvKv gvKo wbab KitZ nq| h_viwZ cġzi cġtoi wKsev cwb i wFZtii AvMvQv cwi`vi KitZ nq| cġzi cwb tmP tdjvi ev gvQ gvivi JIa t`qvi ciciB cġz kZvstK GK tKwR nvti Pz GKwU cvTĪ i gta` Af cwb tZ ,tj mg`cġzi wQwUtq w`tZ nq| Pz t`qvi mvZw`b ci cġz kZvstK 5-7 tKwR tMvei ev 3-4 tKwR gzuMi weov, 100-150 Mġg BDwi qv, 50-75 Mġg wJ.Gm.wc Ges 20-25 Mġg Gg.wc. cwb tZ ,tj cġzi wQwUtq w`tZ nte| i Ktbr cġzi mvi t`qvi ci ciB cwb mieivn KitZ nte|

tcvbr gRz

me`vB cġzi eo AvKvtii tcvbr gRz Kiv DEg| cġzi gRz i Rb` 5-7 tm.ug. AvKvtii tcvbr ubePb Kiv fij | cġz kZvstK 70-80wU nvti tcvbr gRz Kiv hvq|



Ablyj b (Activity) t aly, Avcbri 20 kZvstki GKwU cġz AvtQ| H cġzuU tZ Avcb i vRcW Pvl Kivi K_v fvefQb| tm tġtĪ Avcb H cġzi tivUbb, Pz, `Re I i vmiqubK mvti i tKvbwU Kx cwi gvY tKvbc`wZ tZ cġqvm Kit`eb Ges KZ ,tj v gvQ Qvoteb Zv wj wce`x Kily|

cwi Ph

m`u`i-K Lv` e`envi

cġzi tcvbr gRz i cwi`b t`tK cZ`n gRz gvQ i I R tbi 4-6 fivM nvti w`tb 2 evi Lvevi w`tZ nq| m`u`i-K Lv` wntmte` i ayPvD t j i Kev i Kbr Ae`vq cġzi wQwUtq w`tZ nte| cġz

i vRcW AvZ 9jz`Dv`G RvZiq Lvevi teik cQ` Kti |

gvQ i Pvl I e`e`vcbv

Kul. I cj. Dbqb ǎǎ

gvfm GKevi Rij tUtb wKQygvO Zǎj Zǎi I Rǎbi Mo tei Kǎi Lǎi cwi gvY wbi fcY
KiǎZ nq| Zte i vRcǎw AwZ ǎǎ Dǎw RǎZxq Lvev tevk cOǎ Kǎi | ǎǎ cǎv Avǎǎi
tǎki cǎǎ, tWvev BZǎw Rǎj vktǎ meǎ cǎv qv hvǎ | cǎǎ evtki GKǎw tNi %Zwi Kǎi Dnvi
wǎZǎi cǎZǎw b cwi gvY gZ ǎǎ cǎv mieivn KiǎZ nq| Gme ǎǎ cǎvǎK i vRcǎw cOǎ gZ
mgǎ tLǎ tbǎ |

gvǎQi ǎǎ cǎǎ

gvfm ASZ ǎǎvi Rij tUtb gvǎQi ǎǎ cǎǎ KiǎZ nq| tKǎv tiwM ejvB tǎLv wǎtǎj Zvi
cǎZKǎi eǎǎ KiǎZ nǎ |

tiwM ejvB I cǎZKǎi

i vRcǎw tek k³ cǎwZi gvO Zte cwi tǎki cǎZKǎj Aeǎvi KǎiǎY Gi tiwM cǎZǎiva ǎǎgZv
nm tǎtǎ cǎi | mǎwǎ j ǎǎ Kiv tǎtǎ th kǎZ Avǎǎ cǎi tǎG gvǎ ǎǎ tiwM tǎLv tǎq |
kǎZKǎtǎj G gvO tǎj R I cǎLǎv cǎv tiwM, Mǎtǎ j vǎ ǎǎ AvBk Lǎm cov BZǎw tiwM
Avǎǎ tǎZ cǎi | ZvB kǎZ i ynevi Aǎw b cǎǎ cǎZ kǎZǎtǎ 1 tǎwR nǎi Pǎ
cǎwM Kiv tǎtǎ cǎi |

Abǎǎ cwi Phǎ

- mieivnKZ.Lvǎ gvO wKgZ LvǎO wKbv tm wǎ tǎ mZKǎ wǎ i vLǎtǎ nǎ |
- cǎbǎZ AwZwi³ cwi gvY tǎI j v RǎZxq AvMǎv ǎKǎtǎ tm, tǎvǎK h_vmǎe Zǎj tǎj tǎZ
nǎ |
- gvO cǎbi Dcwi fǎtǎm nǎ Kǎi evZim wǎtǎZ ǎKǎtǎ eǎtǎZ nǎ Aw tǎtǎ Afve nǎtǎQ | G
mgǎ cǎbi Dcwi fǎtǎm ǎvKǎwZi j wǎ wǎ tǎ wKsev Abǎǎ fǎtǎ cǎbǎtǎ Avǎ wǎj Z KiǎZ
nǎ |

AniY

cǎw Qq gymKǎj i vRcǎw cǎj tǎbi ci cǎZǎw 150-200 Mǎg I Rǎbi nǎj AnviY Kǎi
evRi RǎZ Kiv Dǎg | gvO aivi Rbǎ Uǎv teo Rij meǎtǎtǎ Dchǎ | GǎZ KǎwM mnR I
ǎǎZvi mǎtǎ mǎǎǎǎ | gvO aivi meǎtǎtǎ fǎj mgǎ tǎvi i vZ tǎtǎ mKǎj teǎv chǎǎ G
mgǎ gvO aǎtǎ wǎmǎ Kivi mgǎ chǎǎgvO UǎUǎv ǎtǎK | UǎUǎv gvǎQi gǎǎ tǎmǎ | evRǎi
Pwǎǎv tǎmǎ | 25 kǎZvsk Rǎj vktǎ ǎǎ dǎtǎj 250 × 2 = 500 tǎwR Drcǎǎ b cǎv qv tǎtǎZ
cǎi | Zte eǎǎ cǎv Dbǎi nǎj Avi I tǎmǎ Drcǎǎ b mǎǎ |

AwdKǎv gv, tǎi Pǎv

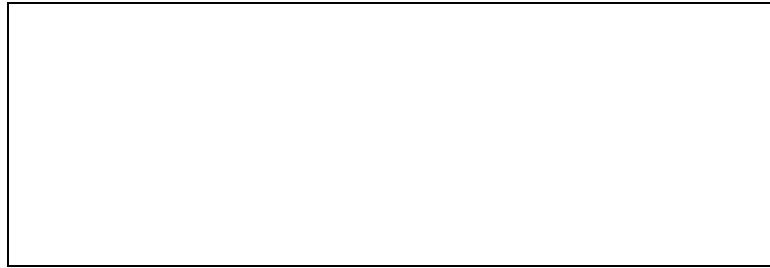
Avǎǎi tǎ kǎ gv, i gvO AZǎǎǎǎǎ yǎ Rbǎǎǎ | G gvO cǎwZK Dm tǎtǎ AnviY Kiv nq |
Kǎǎg cǎRbǎtǎbi gvǎtǎ G gvǎQi tǎvǎ Drcǎǎ eǎvK fǎtǎ cǎvi j vǎ Kǎi wǎ | ZvQvov
cǎwZK Dm tǎtǎ hǎǎ cwi gvǎY tǎvǎ cǎv qv hvǎ bv | dǎtǎ cǎǎ G gvǎQi Pǎv cǎvi j vǎ
Kǎi wǎ | Avǎǎi tǎ kǎ gv, tǎi tǎǎǎ G mgǎ Amǎǎǎ ǎKǎi Kǎi tǎYB meǎ k tǎtǎ 1989
mǎtǎj i wǎtǎmǎtǎ gvfm gv, tǎi GKǎw cǎwZ ǎvBǎ vǎ tǎtǎ evsǎ tǎtǎ Avǎ wǎb Kiv nǎtǎQ | G
cǎwZi gvǎQi Avǎ wǎvǎmǎ j AwǎKǎv | G Rbǎ G gvO AwǎKǎv gv, i bǎtǎ cwi wǎZ |

ǎǎkǎ

- Gǎw AZǎǎǎǎǎ eǎǎǎ gvO |
 - G gvO ǎǎ RǎvMǎq AwǎK NbǎZǎ; Pǎv Kiv hvǎ |
 - Gǎw C I r wǎj cǎbǎtǎZ I evǎtǎZ cǎi |
- BDǎw-8

AwdKǎv gv, i AZǎǎǎǎǎ
ǎǎ eǎǎǎ gvO Ges
ǎǎ RǎvMǎq AwǎK NbǎZǎ;
Pǎv Kiv hvǎ |

- G gvtQi KuĠg cRbb Kiv tek mnR| wZb gvtmi gta` evRvi RvZ Kiv hvq|



uPĠ 65 t AvndKvb gv, i

ckz ubePb I cŰwZ

th tKvb AvqZtbi ckzi G gvQ Pvl Kiv hvq| Zte tQvU AvKvtii ckzi G gvtQi Pvl mnR| 5 kZvsk t_tK 50 kZvsk AvKvtii ckz ntj fvj nq| ckzi MfxiZv 1.5 ugUvi ntj metPtq fvj | tmPtPi gva`tg ckz i`wKtq tdj tZ nte| ckz i`Kvrbv m`e bv ntj 30 tm.ug. Mfxi Zvq cŰZ kZvstK 30-35 MŰg tivtUbb cŰqvm Kitj ckzi AemAZ gvQ I Rj R cŰYx aYsm nte| Gi ci kZvsk cŰZ 1 tKwR nrti Pz cŰqvm KitZ nte| Pz cŰqvtMi mivw b cti cŰZ kZvstK 5-7 tKwR tMvei ev gjvMi weŰv mvi ckzi wQvUtg w`tZ nq| i`Kbv ckzi mvi cŰqvtMi ci ciB cwb mieivn KitZ nte| Gfite mvi cŰqvtMi 5-6 w`b ci tcvbv gRz KitZ nte|

tcvbr gRz

5-6 tm.ug. AvKvtii tcvbr ckzi gRz KitZ nq| AvKvtii ZviZg` ntj eo AvKvtii tcvbr, tjv tQvU AvKvtii tcvbr tLtg tdj tZ cvti| mavi Y e`e`vcbrq cŰZ kZvstK 100-125 wU tcvbr gRz Kiv hvq| Zte e`e`vcbvi mjev avw Kti tcvbr gRz i nvi evortbv thtZ cvti|

mavi Y e`e`vcbrq cŰZ kZvstK 100-125 wU AvndKvb gv, tii tcvbr gRz Kiv hvq|

cvi PhP

m`u`i`K Lv`

m`u`i`K Lv` gv, tii Rb` Acwi nvhP tcvbr gRz i ciw b t_tKB ckzi m`u`i`K Lv` cŰqvm KitZ nte| Lv` ASZ 36-40% cŰYR Lv` _vKv cŰqvRb| G Avngl KmivBLvbn t_tK mSMwZ Mew` ci-cvLi i³ I bmo-fmo, kvgk, wSbjk BZ`w` t_tK cvlqv thtZ cvti| m`u`i`Z KtqKwU temiKwi cŰZŰvb myg m`u`i`K Lv` ^Zwi KitQ| Zte mviwY-1 Ablyrx wevfbaDcv`vbmgn GKĠ Kti m`u`i`K Lv` ^Zwi Kiv hvq|

mviwY 1 t m`u`i`K Lv` ^Zwi i wevfbaDcv`vbi wgtYi nvi |

Dcv`vbi big	wgtYi nvi
Mew` ci-cvLi i ³ I cŰYR Avngl	40%
Mtgi fwl	20%
Pvtj i Kzv	15%
wZj / mvi lvi `Lj	25%

10 ր՝ b ci ci Rvj
tUtԹ ԽKQygvQ aԹi
ZvԹ i IRԹbi Mo tei
KԹi LvԹ i cԽi gvY
Խbi ԳY KiԹZ nԹe|



gvQ Qrovi c՛՛gԻ ր՝K ր՝ Թni IRԹbi 8-10% ր՝Թi Lvevi ր՝ qv i i y KiԹZ nԹe Ges gvQ eo
nI qvi ր՝Թ_ ր՝Թ_ LveԹi i cԽi gvY AvbԳԽԽZK ր՝Թi KԽԳԹ ր՝ ԹZ nԹe (3-4%)| 10 ր՝ b ci ci
Rvj tUtԹ ԽKQygvQ aԹi ZvԹ i IRԹbi Mo tei KԹi LvԹ i cԽi gvY Խbi ԳY KiԹZ nԹe|
ԽԽK ր՝ Թi-K LvԹ i AԹaR ր՝ ԹԹKԹ c՛՛qԽM KiԹZ nԹe| Lvevi GK RvqMvq ր՝ ր՝ ԹԳ GKԽaK
RvqMvq ր՝ ԹZ nԹe| ր՝ԹZ me gvQ H Lvevi ր՝ ԹԹZ cԹi |

AbԳj b (Activity) t a i y, Avcbvi GKԽU cԳԹ AvԹQ ր՝ Թ AvԳZb 30 kZisk, ԳԹZ Avcb
AԽԹKԻb ր՝ Թi i 5 ր՝ ԽԽԽԽԽԽԽ AvKԻԹi 3000 ր՝ ԽԽԽ ր՝ ԹԹԹԹԹ| H cԳԹ 10 ր՝ KԽR ր՝ Թi-K
LvԹ i c՛՛qԻRb ր՝ Թj Mew ր՝ Խi-cԽLi i 3 I cԽYR AvԽԳ, MԹgi ր՝ ԽԽ, PԹԹi KԽ, ր՝
ԽZ/ր՝ ԽԽ ԽԽ ր՝ ԽԽ ր՝ ԽԽ KԹi ր՝ Թi-K LvԹ i ԽԽ KiԹZ ր՝ KԽԽԽ Kx cԽi ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
GKԽU ր՝ ԽԽ ր՝ ԽԽ KiԹ|

gvԹi ֆ ր՝ cԽԽԽԽԽ

c՛՛Z ր՝ ԽԽԽԽ GKevi Rvj tUtԹ gvԹi ֆ ր՝ cԽԽԽ KiԹZ nԹ| ր՝ ԽԽԽ aԹԹi ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
ր՝ ԽԽ Zvi c՛՛ZKԻԹi i e ր՝ ԽԽ KiԹZ nԹe|

Ab ր՝ cԽ Ph

AԽԹKԻb ր՝ Թi i gvQ ֆ eaԹԽԽ | G c՛՛RԽZi ր՝ ԽԽ LvԹ i ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
ԹԹj AԹ ր՝ ԽԽ ր՝ ԽԽ e ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
c՛՛Z ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
cԻԽԽ ZԹ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
nԹe| G gvQ tek k 3 c՛՛KԽZi | Z ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
BZ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ

AԽԹKԻb ր՝ Թi i ր՝ ԽԽ
ր՝ ԽԽ ր՝ ԽԽ | ZvB G gvQ ex
Rj ր՝ ԽԽ e ԽԽ Z ր՝ ԽԽ ր՝ ԽԽ
ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
AegԹ Kiv DԽPZ nԹe
ր՝ |

mZKԹ

G c՛՛RԽZi ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
cԽԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
e ԽԽ Z ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
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gvQ Ani Y

ր՝ ԽԽ ր՝ ԽԽ 100-120 ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
60-70 ր՝ b ci ր՝ ԽԽ c՛՛Z ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
ր՝ ԽԽ ր՝ ԽԽ | teo Rvj tUtԹ G gvQ aiv ր՝ ԽԽ | ZԹ c՛՛Z ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
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tZj ր՝ ԽԽ ր՝ ԽԽ

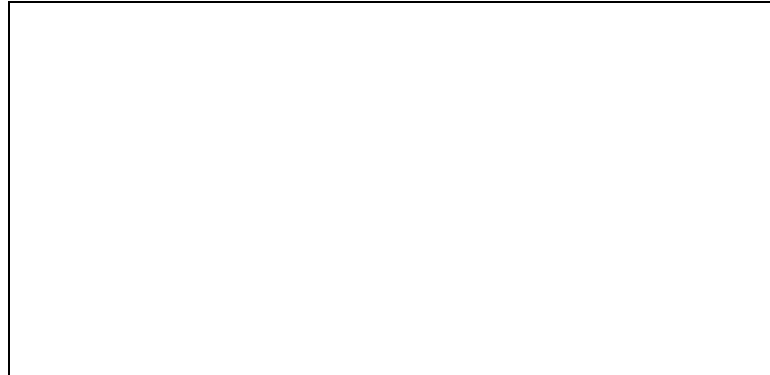
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- tZj ր՝ ԽԽ ր՝ ԽԽ tek k 3 ր՝ ԽԽ ր՝ ԽԽ ր՝ ԽԽ
- ԳԽU AԽaK dj bkj I ր՝ ԽԽ ր՝ ԽԽ

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- Zj bvgj-Kfite Aí mgta `f e`ta mntRB AnaK cwi gvtY G gvQ Pvl Kiv hvq|



uPÍ 66 t tZj mcqv

ckz ubePb I cÜwZ

th tKvb AvqZtbi ckzi G gvQ Pvl Kiv hvq| Zte ckzi i AvqZb 10-20 kZvsk ntj fij nq| G gvQ Pvl i Rb` ckzi i Mfxi Zv t`o ugUvi ntj fij nq| tZj mcqv 3-4 gvtmi gta` evRvi RvZ Kiv hvq| ZvB G gvQ Pvl i Rb` 5 gym cwb _vtK Ggb ckz ubePb Kiv DvPZ|

tmtpi gva`tg ckz i`Ktq iv`m gvQ mvi`tg tdj tZ nte| Zte i`Kv`bv m`e bv ntj Rvj tUtb miv`Z nte| cÜZ kZvstk 30 tm.ug. cwb tZ 30-35 Mlg nvti tiv`Ubb cÜqvm Kij mKj gvQ, Rj R cÜx aYsm nte| iv`m gvQ miv`bvi ci cÜZ kZvstk GK tKvR nvti Pz cÜqvm Kitz nte| cv`ti Pz (Kwl. Pz CaCO₃) cwb tZ , tj ckzi uQuUtg w` tZ nte| Pzbi gvTiv gvUj , Yv, tYi I ci w`fiv` Kti Kg tewk ntZ cvti |

Pz cÜqvtMi GK mBvn cti `Re A`Re mvi cÜqvm Kitz nte| cÜZ kZvstk 3-4 tKvR nvti tMvei mvi, BDwi qv 35 Mlg I uU Gm uc 65 Mlg fij fite gvU tZ uguktq w` tZ nte| Gi ci ckz cwb w`tg cY`Kitz nte| ckzi cwb _vKtj Dij - uLZ cwi gvY mvi cwb tZ , tj uQuUtg cÜqvm Kitz nte| mvi cÜqvtMi 2-3 w` tbi gta` cwb i s nuj Kv meR eY`ntj tZj mcqv Qvovi Dchj` mgq nq| Gi cti I cÜKvZK Lv``i NvUvZ t`Lv w` tj cÜZ kZvstk 50 Mlg BDwi qv I 100 Mlg uUGmuc uQuUtg cÜqvm Kitz nte|

tcvbr gRj

5-7 tm.ug. AvKv`ti i tcvbr cÜZ kZvstk 80 t`K 100 uU nvti gRj Kitz nte|

cvi Ph

tZj mcqv GK uU me`K gvQ| Zte Pvtj i Kzv, Mtgi fvl, mvi lvi `Lj PY`Kti m`u`i`K Lv`` %Zwi Kti Lv`` w`ntmte w` tZ nte| ckzi th cwi gvY gvQ AvtQ Zvt` i kixti i IRtbi kZKiv 4-6 fivM nvti m`u`i`K Lv`` `ÜfivM Kti mKvtj I me`Ktj uQuUtg w` tZ nte| cÜZ mBvtn Rvj tUtb gvQ ati Zvt` i IRtbi Mo Kti Lv``i cwi gvY w`ba`Y Kitz nte|

Kul. I cju Dbq b ˘z

gvfQi ˘r cixŋiKiY

gvfm ASZ ctŋ ˘ŋevi Rvj tUtb gvQi ˘r cixŋi KiŋZ nte| tKubiŋc tivM evj vB ˘Lv
w˘ tj cŋZKvŋi i e˘v ˘vbtZ nte|

AniY

Pvi ˘tK cvB gvŋmi gta˘ G gvQ evRviRvZ Kiv hvq| teo Rvj w˘tq G gvQ mnŋRB aiv
hvq| Zte me gvQ aivi Rb˘ cŋZ i˘Ktq tŋjŋZ nte| GKevŋi Prŋl G gvŋQi Drcv˘b
˘vovq weNv cŋZ 250-300 tKwR| Zte e˘vcbv Dbz Kŋi Drcv˘b Avi l evx Kiv m˘e|

Pvi ˘tK cvB gvŋmi
gta˘ ˘Zj ˘vcqv gvQ
evRviRvZ Kivi
DcŋhMx nq|

cŋŋi wRIj gvŋQi Pvl

cŋŋi wRIj gvŋQi Pvl ˘tK gvŋQi Drcv˘b evx i GKwU beZg D˘ ˘M| iŋ, KivZjv, gŋMj
gvŋQi mŋR Pvl thgb- A_Rix, tZgwbfvte cŋŋi wRIj gvŋQi Pvl l Mŋg AAŋj GKwU
jvFRbK e˘emv nŋZ cvŋi |

wRIj gvQ (Air breathing fishes)

wks, gv, i l KB Avgt˘ i ˘tKi AwZ cwi ˘PZ gvQ| mvariYZ Gme gvQŋK wRIj gvQ ejv
nq| Rxeŋl Ae˘vq Gme gvQ evRvŋi Pov ˘vŋg weŋu nq| wRIj gvQ cŋŋi Ki gvQ| Gme gvŋQ
kixŋi DcŋhMx tjŋn tewk AvŋQ| tm c˘v_ŋK, mnŋR nRg nq| tmRb˘ i ˘vi Zvq tivM
˘fvŋmi cŋi G aitŋi gvŋQi c˘ DcKvix| Avevi tZj gmjvhŋ Gme gvŋQi ivb˘mKŋj i
KvŋQ AwZ wcbŋ|

wks, gv, i l KB gvŋŋK
mvariYZ wRIj gvQ ejv
nq|

wRIj gvŋQi ˘ewkó˘

wRIj gvŋQi AwZwi ˘ kŋmZŋ;AvŋQ| wRIj gvQ evZim ˘tKl kŋmb KiŋZ cvŋi | wRIj gvQ
mvariY gvŋvi Aw ˘Rb ˘tK AŋbK Kg Aw ˘Rb hŋ cwbŋZ evŋŋZ cvŋi | wRIj gvQ AZ˘ŋl
mnbkxj gvQ| Avgt˘ i ˘tK KPrŋi cvbŋZ AveZ AŋbK wej cwiZZ Ae˘vq AvŋQ, ˘fveZB G
aitŋi weŋj i cwbŋZ Aw ˘Rb AZ˘ŋl Kg Ges KveŋwB-A. vBW tewk ˘vŋK| G aitŋi
cwbŋZ iŋ, KivZjv RvZixq gvQ wUKŋZ cvŋi bv, wKŋ GiKg Rjvktŋl wRIj gvQ ˘vŋK|
KvŋRB wRIj gvQ ˘tKi me iKg cŋŋi Pvl Kiv m˘e| weŋkl Kŋi thme cŋŋZ tKib iKg
A_ŋwZK KvŋR Avŋm bv, tm mg˘- cŋŋl wRIj gvQ Prŋli Avl Zvq Gŋb gvŋQi Drcv˘b
evovŋbv m˘e|

wRIj gvŋQi Lv ˘vf˘m

wRIj gvQ mvariYZ Avngl RvZixq Lv ˘ MŋhY Kŋi cŋKwZK cwiŋek ˘tK| cwiZZ Rjvktŋ eu
KvUcZ½ Rjvktŋi ZjŋtK ˘vŋK| G mg˘l KvUcZ½ Qvovl Dvŋŋ˘ i cvZv, Ab˘v˘ AveRŋv
BZ˘w ˘RweK wgvY Avacŋv Ae˘vq ZjŋtK Rgv ˘vŋK| wRIj gvQ G me tLŋq eo nq|
wRIj gvQ cŋŋi Pvl Kivi mgq evBŋi ˘tK cwiŋekb Kiv Lv ˘ MŋhY Kŋi | cŋŋi cwiŋekb
Kiv Lv ˘ MŋhY Gme gvŋQi ˘ewkó˘|

wRIj gvQ cŋŋi Pvl
Kivi mgq evBŋi ˘tK
cwiŋekb Kiv Lv ˘ MŋhY
Kŋi |

cŋŋi wRIj gvŋQi Pvl (Culture of air breathing fishes in pond)

cŋŋi ŋKej gv, i gvQ ev wks gvQ ev KB gvQ GKK Pvl ev gv, i l wks gvŋQi wgvPvl Kiv
hvŋe| iŋ, KivZjv, gŋMj gvŋQi mŋ½ gv, i l wks Pvl Kiv hvŋe|

ckzi bePb

tQvU eo me ckzi B gv, i I mks Pvl Kiv hrte| 5 kZvsk cwi gvY AvqZtbi ckzi t`tK 30 kZvsk AvqZtbi ckzi G gvQi Pvl fuj nte| Zte Mitgi mgq ckzi A`Z 60-70 tm.ug. cwb _vKv`iKvi| ckzi ms`v`ti Rb` LiP KitZ nte bv Zte ckzi i eva fivv _vKtj tQvU LvU tgiugZ Kti tbqv fuj| ckzi i cmbi Dcwi fivM KPzi cvbr Qvov AveZ _vKtj KPzi cvbr DvWtq tdjtZ nte| ckzi gv, i ev mks gvQi tcvbr tcvbr Qvovi AvtM cteP gvQ Rvj w`tq Ztj tdjtZ nte| cteP gvQ webvk Kivi Rb` ti vUbb cUqM Kti me gvQ tgti tdjv hvq|

gv, i gvQi tcvbr Qvovi nvi

gv, i gvQi tcvbr cUz kZvsk 200uU intmte Qvov nq| GK tKvRtZ 100-125 uU nq G i Kg tcvbr ckzi Qvov hrte| tcvbr, tjjv thb vbtivM nq Ges`N`8-12 tm.ug. Gi KvQvKvQ nq| elP cti ckzi gv, i gvQi tcvbr Qvov nq| i agvI mks gvQi tcvbr Qvovtj D³ msL`v nte cUz kZvsk 300-400uU| GK tKvRtZ Gi Kg gvQi tcvbr cUq 150-200uU nq|

ckzi Lv` cwi tekB

gv, i gvQi tcvbr ckzi Qvovi ci Lv` cwi tekB KitZ nte| gv, i gvQ Avngl vcbi gvQ| i Kbv gvQi , av hr vdkugj bvtg cwi vPZ A`ev Kg`v`gi i Kbv gvQ G RvZxq gvQi fuj Lv`| vdkugj ev i Kbv gvQi e`tj tikgti , uU Lv` intmte t`qv hrte| avtbi Kzv, vdkugj ev i Kbv gvQi mtz mgkY Kiv nq| v`v`v vdkugj GK fivM avtbi Kzv GB`tqi mgkY nte gv, i gvQi Lv`| Lv` w`tb`v`v w`tZ nte| mKvtj 1/2 fivM, mU`vq evKx Lv`| Lv` ckzi i cmbi Dcwi fivM Qvovtq t`qv hrte A`ev Lv`, tjjv cmbtZ vngkta tQvU tQvU tMvjv Kti ckzi i tKvYvq evtki Svo i gta` cmbi vFZti i vLv hrte| gv, i gvQi ckzi th Lv` cwi tekB Kiv ntqtQ Zv cvvj Z gvQ Lvq vK bv Zv j`v` i vLtz nte| gv, i gvQi Lv` intmte vdkugj, i Kbv gvQ, avtbi Kzv Qvov mvi lvi `Lj, ev`vg`Lj, b`o ntq hv lqv Pvj, Mtgi , av KvR j vMvbr hrte| Zte vdkugj ev i Kbv gvQ Lv` intmte cwi tekB Kitj G gvQ`Z evto|

gv, i gvQi Lv` intmte vdkugj, i Kbv gvQ, avtbi Kzv Qvov mvi lvi `Lj, ev`vg`Lj, b`o ntq hv lqv Pvj, Mtgi , av KvR j vMvbr hrte|

Lv` i cwi gvY

cwi tekB Kiv Lv` i cwi gvY ckzi Qvov tcvbr gvQi tgvU IRtbi Dci vbfP Kti vK Kiv hvq| Gfite ckzi hZ tcvbr Qvov nq, Zvi IRtbi kZKiv 4 fivM t`tK 5 fivMi gZ cUg gv`mi Lv` i cwi gvY| gvQi IRb mgtaq mtz evote, Lv` i cwi gvY tmfite evovtZ nte|

hZv cwi PhP

ckzi cvvj Z gv, i gvQtK hZvKti eo KitZ nte| ckzi ti vR Lv` w`tq gvQ evotQ vK bv t`Ltz nte| cUz gv`m ckzi Rvj w`tq gvQ Ztj gvQ cix`v Kiv`iKvi| gvQi IRb evotj Lv` i cwi gvY evovtZ nte| thgb- Qvovi mgq cUz uU gvQ`k Mlg vQj, GKgvM cti 20 Mlg ntqtQ| ZLb Lv` vU, Y nte| G fite cUz gv`m gvQ cix`v Kti Lv` i cwi gvY vK Kiv ntq`v`K|

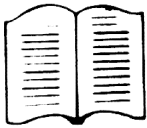
gv, i gvQ ckzi Pvl Kivi mgq cUv t`tK Qq gvM| KvRb GB mgq ati Lv` cwi tekB KitZ nq| tk`li GK gvM Lv` evovei`iKvi nq bv| maviYZ kvZKvtj Ab`vb` gvQi gZ ev`x Kg nq, vKŠ Mitgi mgq gvP`gvM t`tK`Z ev`x nq| cUz w`tb`v`v 1 Mlg ev`x cvq|

Kul. I cj. Dbaqb փ

Mitgi mgta gvtQi cKzi me^ov j Գ¹ ivLtz nte| gvtQi tKvbl Amyeav gtb ntj Lv¹ i
cwi gvY KgtZ nte| cu^o gvtm gv₃ i evRvti ¹ Dch^o nte| 10-11 gvtm 1 tKvR փvavq|
cKzi gv₃ i gvtQi Pvl Kvj xb Գ¹ Kz Kg| G c^ovZtz c^oq Avnk FvM gvQ vU¹K _v¹K|

gvQ AniY

cKzi eo gv₃ i gvQ tLc^ov Rvj, Uvbr Rvj փ¹q aiv hvte| gvQ m^ouY^ofc ntj cKziW
cvt^oui m^ov^oth^o iKvtZ nte| cKz₃ t^ov c^oqB t^ovU GRb^o cv^ou j vM^otq el^o Av^oM K^otqK
N^oUvi g^ota^o iKbr Ki^otZ Amyeav tbB| Gf^ovte gvQ aivi LiP, Rvj փ¹q gvQ aivi LiP t^oփK
Kg n^otZ cv^oti| P^otl i cKz₃ t^oփK gv₃ i gvQ AniY tKvbl mgm^ovi KvR bq| 25 kZvsk
AvqZ^obi GKvU cKzi 400 tKvR gvQ Drcv^o b n^otZ cv^oti| t^o kx gv₃ tii Pvl c^ovZ Abv^oY
K^oti c^o K c^o Kf^ovte ev GK m^ot^o vks I KB gvQ Pvl Kiv hvq|



mvi gg^o _vB mic^ovi ev ivRcv^o GKvU փ^oea^oBk^ovj m^oY^o ygvQ| t^ovU eo me i Ktgi tW^oev,
cKz₃ փ^oW I cwi Z^ov^o Rj v^oktq G gvQ Pvl Kiv m^oe^o| c^oz kZvst^oki cKzi 5-7 tm.ig.
AvKvt^oii 70-80vU _vB mic^ovi tcvbr gR^oz Kiv hvq| 5-6 gvm mg^otqi g^ota^o c^ozW ivRcv^o
150-200 M^og IR^obi nq| Av^odK^ov gv₃ i me^oPK gvQ| GvU փ^oea^oBk^ovj Ges փ^o RvM^ovq
Av^oaK m^oL^oK Pvl Kiv hvq| m^ov^oY e^ove^o v^ocbvq c^oz kZvst^ok 5-6 tm.ig. AvKvt^oii 100-
125vU tcvbr gR^oz Kiv hvq| Av^odK^ov gv₃ tii Lv^o ASZ 36-40% c^ovYR Av^ogl _vKv
c^oq^oRb| m^ov^oYZ 100-120 փ^obi P^otl G gvtQi Mo IRb c^oq 300-500 M^og nq|
evs^ojt^o փ^oki Av^oevl qvq t^ovU tW^oev ev cKzi tZj v^ocqv Pvl Kiv m^oe^o| 4-5 gvtmi g^ota^o G gvQ
evRvi RvZ Kiv hvq| vks, gv₃ i I KB gvQ^oK vR^oij gvQ ejv nq| G^oti t^o փ^o փ^o n^o c^o v^o K^o
_v^oփK Ges m^ot^oR nRg nq| vR^oij gvQ cv^oKi| vR^oij gvtQi AvZ^o v^o k^oYmZ^oš; v^o v^ogvb|
A^oփ^o Գ^o v^oKZ. v^o v^o N^obt^o vR^oij gvQ Pvl Kiv m^oe^o|



cvfVvEi gj`vqb 8.1

mWk DEti i cvk UK Pý (✓) w b|

1/ cZ kZvst`k _vB mi cvw ev i vRcwi t`civr KZw Qvov DvPZ?

- K) 170-180 wU
- L) 70-80 wU
- M) 7-10 wU
- N) 700-800 wU

2/ iv`zm gvQ ev Ab`vb` AemAZ cWx gvivi Rb` cZ kZvst`k Kx cwi gvY tivfUbb cWvM Ki`Z nte?

- K) 30-35 Mlg
- L) 15 20 Mlg
- M) 5-10 Mlg
- N) 75-80 Mlg

3/ tKvbw AvvdKvb gv, i Pvl i Rb` Amjeavi mwó Ki`Z cvti?

- K) Lv`i Afve ntj eo gv, i tQvU gv, i tK tLtg tdtj
- L) Avngl tfrRx
- M) t`wk msL`K wlg avi Y Kti
- N) t`L`Z tZgb my`i bq|

4/ tKvbw wRI j gvQ bq?

- K) gv, i
- L) wks
- M) KB
- N) Kizjv

cW 8.2 tǝb gvQ Pvl I e'e ǝcbv, Bwǝ k gvQ Dbaqb I e'e ǝcbv



G cW tkǝl Avǝb –

- tǝb ǝZwi cǝwZ eYǝv KiǝZ cviǝb|
- tǝb gvQ Pvl Kǝ Kǝ Ki Yǝq Zv e'vL ǝ KiǝZ cviǝb|
- Bwǝ k gvǝQi cǝRbb I wǝPi Y tǝǝtǝi eYǝv wǝ ǝZ cviǝb|
- Bwǝ k gvǝQi e'e ǝcbv Kǝfǝtǝ Kiv thǝZ cviǝ Zv Avǝj wǝPbv KiǝZ cviǝb|



tǝb gvQ Pvl I e'e ǝcbv

evsǝj ǝt ǝki cǝq me Aǝtǝ B wǝwfbǝcKvǝti i AmsL ǝ Dbaǝ Ges Aveǝ Rǝjvkq i tǝqǝQ| thǝb-
 tmP cǝKǝi, iv ǝli cvk, ǝl Lǝj, tǝvU eo b ǝx, eb ǝv cǝwZ wǝwǝRǝjvǝfǝg, nvl o, evl o BZ ǝw
 thLǝtb mǝgǝqKfǝtǝ A_ev ǝvǝfǝtǝ cǝwb ǝtǝK| G mg ǝRǝjvkq ǝǝǝwǝK Dcǝtǝ gvQ Pvl
 Kǝi Drcǝb evǝtǝbv mǝǝl wǝKǝ' Gme Rǝjvkq wǝwfbǝAmǝǝvǝi Kǝiǝ Y wǝwǝo gvQ Pvl i
 Avl Zǝq Avǝb mǝǝe nq bv| thǝb Gme Rǝjvkqǝi Pvl wǝtǝKi cvo gReǝ ǝtǝK bv| Avevǝ tǝKvb
 tǝKvb mgq cvo ǝtǝK bv| Zǝv G ǝj ǝtǝZ gvQ I gvǝQi cǝw tǝkǝtǝK wǝbqǝǝ' ivLv hǝq bv| Zǝv G
 tǝǝtǝ Rǝjvkq tǝb gvQ Pvl Kiv thǝZ cviǝ| tǝb gvQ Pvl cǝwǝ tǝwǝ wǝtǝbi bq| Rǝcǝtǝ
 cǝg G cǝwǝ cǝhvi j ǝvǝ Kǝi| Gici wǝwǝj cǝBb, Bǝ ǝtǝwǝkǝv, ǝBj ǝvU, Pǝb I gvǝ tǝwǝkǝv G
 cǝwǝ e'envi KiǝQ|

Rǝcǝtǝ cǝg tǝb gvQ
 Pvl cǝwǝ cǝhvi j ǝvǝ
 Kǝi|

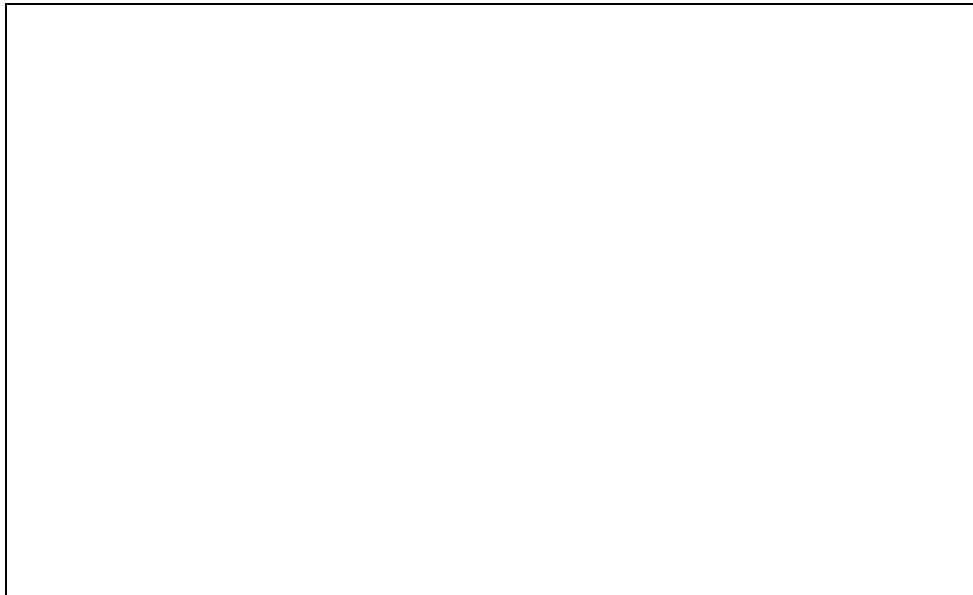
ǝw wǝwǝ

thme eǝr Rǝjvkq mǝvǝi Yfǝtǝ wǝwǝo Pvl i Avl Zǝq Avǝb mǝǝe bq tmme RǝjvkqǝK tǝb gvQ
 Pvl i Rb ǝwǝwǝ Kiv cǝqǝRb|

tǝb ǝZwi

evkǝ, MǝtǝQi Wǝj BZ ǝw ǝvǝv DcKi Y wǝtǝq ǝZwi teov wǝKsev Rǝj wǝtǝq tǝb ǝZwi Kiv nǝq|
 Rǝjvkqǝi cǝtǝKg nǝj Dnvi GK cvk t ǝtǝK Avǝi K cvk chǝǝAvǝvǝwǝfǝtǝ Lǝj cǝtǝZ teov
 wǝtǝq mnǝtǝRB tǝb ǝZwi Kiv hǝq| Rǝj wǝtǝq teov t ǝqvi mgq j ǝ ǝvLǝZ nǝtǝ hǝtǝZ Rǝtǝj i Ni
 1 tmwǝwǝgǝvǝ Gi tǝwǝk bv nǝq| KW ǝv cǝw w_b Rǝj e'envi Kiv DǝpZ|

evkǝ, MǝtǝQi Wǝj BZ ǝw
 ǝvǝv DcKi Y wǝtǝq ǝZwi
 teov wǝKsev Rǝj wǝtǝq tǝb
 ǝZwi Kiv nǝq|



¶P 67 t tctb gvQ Pvl

iv¶jzn ev AewAZ gvQ `gb

tcb`Zwi i ci Rivj tUt b hZ`i mæe iv¶jzn gvQ thgb- tkvj, tevqvj, MRvi, AvBi, UmK, dij BZ`w` Ges tetj, `vomKbv, Pwncjv, Pw`v BZ`w` AewAZ gvQ mwi tq tdjvi e`e`v Ki tZ nte|

tcbvi AvKvi I msL`v

tctb weifbecRwzi gvQ QvotZ nte thb cwbi mKj `t`ii Lvef`ii mWk e`envi nq I hvt`i tcbv mnRj f` Ges hvt`i Af mg tq Pvl Kti evRvti weµq Kiv hq| iB, KvZjv, g¶Mj, wj fvi Kvc`ivRcv BZ`w` cRwzi gvQ tctb Pvl Kiv mæe| Awak dj tbi Rb` mÿ` mej tcbv wv`e nvti gRz` ivLv DvPZ| tcbvi AvKvi tKvb µtgB 4 BwAi Kg thb br nq| KviY tQvU tcbv tctbi teov ev Rvtji duk w` tq tei ntq hvlqvi mæebv `vtK| ZvQvov iv¶jzn gvQ AtbK mgq mæu`p`c mwi tq tdjv AtbK mgq mæe bvl ntZ cvti | ZvB 4 BwAi tQvU tcbv tL tq tdjvi mæebv `vtK| cwbi , Yv, tYi Dci wfiE Kti tñzi cAZ 17500wU t`tK 25000wU tcbv Qvov thtZ cvti | iB, KvZjv, g¶Mj, wj fvi Kvc`I KwncP h_vµtg 30t 20 t 10 t 10 t 30 nvti gRz` Ki tZ nte|

tctb Lv` mieiv

gRz`KZ.gvtQi tgvU IRtbi 1% nvti gvtQi mnRj f` Lv` h_v `Lj, Kæv, fwl BZ`w` cØqvM Kiv thtZ cvti |

gvQ aiv

tctb 6/7 gvtmi gta`B evRvti i Pwv`vgZ weµqthwM` gvQ Drcw` Z nq| Uvov Rivj w` tq tcb t`tK gvQ aiv thtZ cvti |

Bij k gvQ Dbqb I e`e`vcbv

evsj vt` tki RivZiq gvQ Bij k| GKK cRwZ wntmte Bij k me`epr Ges mev`c¶lv , iZcY` grm` mæu` | t` tki tgvU grm` Drcv` tbi kZKiv cØq 20-25 fwl Bij k gvtQi Ae`vb|

iB, KvZjv, g¶Mj, wj fvi Kvc`ivRcv BZ`w` cRwzi gvQ tctb Pvl Kiv mæe| tcbvi AvKvi tKvb µtgB 4 BwAi Kg thb br nq|

tctb 6/7 gvtmi gta`B evRvti i Pwv`vgZ weµqthwM` gvQ Drcw` Z nq|

GQov G t̄tki t̄gv RbmsL̄vi kZKiv c̄q̄ 2 fivMi I tewk t̄jvK RmeKvi Rb̄ c̄Z̄ǰ ev c̄tivǰfite G m̄ut̄`i Dci ubf̄P̄k̄j | Buj k gvt̄Qi c̄c̄Z̄vi c̄wimsL̄v̄tb̄ t̄Lv̄ hvq̄ th, AZx̄Z̄ kZKiv c̄q̄ 95 fivM Buj k gvt̄Q c̄Uv̄ I t̄gn̄bv̄ b̄`mn̄ t̄tki ǰewfbab̄`-b̄`x̄ n̄Z̄ Ges gv̄I kZKiv 5 fivM mḡȳ n̄Z̄ Avni Z̄ n̄Z̄v̄ | ǰK̄S̄` eZ̄ǰv̄tb̄ kZKiv c̄q̄ 64 fivM Buj k gvt̄Q mḡȳ I mḡȳ DcK̄z̄x̄q̄ Ḡjv̄Kv̄ n̄Z̄ Ges gv̄I kZKiv c̄q̄ 36 fivM ǰewfbab̄`-b̄`x̄ n̄Z̄ Avni Z̄ n̄Z̄Q | Buj k gvt̄Qi m̄vḡuM̄K Drcv̄`b̄ AZx̄Z̄i Z̄z̄bv̄q̄ eZ̄ǰv̄tb̄ n̄m̄ bv̄ t̄ct̄j I th̄ m̄vḡub̄` ew̄x̄ t̄ct̄q̄t̄Q Z̄v̄ μgeāǰv̄b̄ RbmsL̄`v̄ ew̄x̄i Z̄z̄bv̄q̄ L̄ǰB̄ b̄MȲ` | eZ̄ǰv̄tb̄ th̄ fite t̄tki ǰewfbab̄`-b̄`xi c̄wīt̄ekM̄Z̄ c̄wīeZ̄B̄ n̄Z̄Q Z̄v̄ Aē`v̄n̄Z̄ _v̄K̄t̄j̄ f̄iel̄ t̄Z̄ Buj k gvt̄Qi c̄R̄bb̄ I ǰePiȲ t̄ǰ̄I Ges c̄wīāḡȲ c̄t̄_ī Av̄i I tewk c̄wīeZ̄B̄ I b̄ó n̄te | R̄v̄UK̄v̄ ubab̄mn̄ Buj k gvt̄Qi Av̄ni Ȳ gv̄Iv̄ Av̄i I ew̄x̄ t̄ct̄Z̄ _v̄K̄t̄j̄ Av̄M̄vḡx̄ eQī , t̄j̄v̄t̄Z̄ Buj k gvt̄Qi m̄nbk̄j̄ Drcv̄`b̄ Av̄ks̄K̄v̄R̄b̄K̄ fite n̄m̄ c̄v̄te | K̄v̄t̄RB̄ Ḡ gvt̄Qi Av̄ni Ȳ gv̄Iv̄ m̄nbk̄j̄ ch̄ǰq̄ eR̄v̄q̄ iv̄L̄v̄mn̄ Drcv̄`b̄ ew̄x̄i j̄t̄ǰ̄ Buj k gvt̄Qi `R̄ieK̄ ē`ē`v̄cb̄v̄i Rb̄` Ḡ gvt̄Qi R̄ieb̄P̄μ̄, ǰē`l̄z̄, c̄R̄bb̄ , ǰK̄t̄k̄vi Buj t̄ki ǰePiȲ t̄ǰ̄I, gR̄z̄ ub̄if̄c̄Ȳ I c̄ǰK̄ūZ̄K̄ gR̄z̄ ub̄if̄c̄Ȳ B̄Z̄`w̄` ǰel̄t̄q̄ mḡ`K̄ av̄i Ȳ _v̄K̄v̄ Av̄ek̄`K̄ | ew̄ȲZ̄ ǰel̄t̄q̄ ub̄t̄`am̄st̄ǰ̄t̄c̄ Av̄t̄j̄ v̄P̄bv̄ K̄iv̄ n̄t̄j̄ v̄ |

Buj k gvt̄Qi t̄f̄S̄m̄j̄ K̄ ǰē`lī

ev̄sj̄v̄t̄`k̄mn̄ c̄v̄K̄f̄v̄iZ̄ Dcgn̄t̄`tki Av̄t̄iv̄ K̄t̄q̄K̄ūI t̄`k̄ th̄gb̄- f̄v̄iZ̄, c̄w̄K̄`l̄b̄ Ges ǰḡq̄v̄b̄gv̄t̄i Ḡ gv̄Q̄ c̄v̄l̄qv̄ hv̄q̄ | GQov̄ c̄v̄im̄` Dcm̄Mi t̄`t̄K̄ t̄j̄v̄n̄Z̄ m̄Mi, Av̄ie m̄Mi, ǰf̄t̄q̄Z̄bv̄ḡ I `ǰ̄ǰ̄Ȳ P̄x̄b̄ m̄Mi ch̄š̄f̄Ḡ gvt̄Qi ǰē`l̄z̄ | Z̄te c̄K̄ūZ̄M̄Z̄ f̄v̄teB̄ ev̄sj̄v̄t̄`k̄, f̄v̄iZ̄ I ǰḡq̄v̄b̄gv̄t̄i B̄ Ḡ gv̄Q̄ m̄ēf̄c̄ǰ̄v̄ tewk̄ c̄v̄l̄qv̄ hv̄q̄ | Gi ḡt̄ā` kZKiv c̄q̄ 75 fivM gv̄Q̄ aiv̄ c̄to |

Buj k gvt̄Qi R̄ieb̄P̄μ̄ I `eik̄ó`

Av̄f̄c̄ǰ̄v̄b̄ (Migration)

Ḡ gvt̄Qi R̄ieb̄ c̄K̄ūZ̄ I `eik̄ó` ē`v̄P̄I`ḡq̄ | Buj k t̄`k̄v̄š̄lī c̄K̄ūZ̄i Ḡ gv̄Q̄ AZ̄`š̄`` Z̄ M̄ūZ̄t̄Z̄ DR̄v̄b̄ t̄m̄t̄Z̄ m̄v̄z̄vi t̄K̄t̄Ū P̄t̄j̄ | Lv̄` I c̄R̄b̄t̄bi Rb̄` Buj k gv̄Q̄ eQ̄t̄i ǰewfb̄em̄ḡt̄q̄ m̄Mi n̄Z̄ b̄`xi t̄gv̄n̄bv̄ t̄et̄q̄ DR̄v̄b̄ t̄m̄t̄Z̄ āti b̄`x̄t̄Z̄ Av̄f̄c̄ǰ̄v̄b̄ K̄t̄i | t̄tki ǰewfbab̄`-b̄`x̄t̄Z̄ ǰW̄ḡ Q̄v̄ori ci Ḡiv̄ Av̄evi mḡȳ` ǰd̄t̄i hv̄q̄ | Ac̄iv̄ t̄K̄ Buj t̄ki ti Ȳv̄R̄v̄UK̄t̄Z̄ c̄wīȲZ̄ n̄l̄qv̄ ch̄š̄f̄ (Ab̄w̄aK̄ 5-6 ḡv̄m̄ eq̄m̄ ch̄š̄f̄) b̄`-b̄`x̄ I t̄gv̄n̄bv̄q̄ Aē`v̄t̄bi ci th̄š̄eb̄ c̄ǰB̄ n̄l̄qv̄i Rb̄` Ḡiv̄l̄ mḡȳ` Av̄f̄c̄ǰ̄v̄b̄ K̄t̄i | c̄wīc̄`Z̄v̄ j̄v̄t̄fi ci ḠKB̄ ub̄q̄t̄q̄ c̄R̄b̄t̄bi Rb̄` Ḡiv̄ c̄ȳiv̄q̄ mḡȳ` t̄`t̄K̄ b̄`-b̄`x̄t̄Z̄ Av̄t̄m̄ |

Lv̄` I c̄R̄b̄t̄bi Rb̄`
Buj k gv̄Q̄ eQ̄t̄i ǰewfb̄e
mḡt̄q̄ m̄Mi n̄Z̄ b̄`xi
t̄gv̄n̄bv̄ t̄et̄q̄ DR̄v̄b̄ t̄m̄t̄Z̄
āti b̄`x̄t̄Z̄ Av̄f̄c̄ǰ̄v̄b̄
K̄t̄i |

Buj k gvt̄Qi c̄wīc̄`Z̄v̄ I c̄R̄bb̄ t̄ḡš̄m̄ȳ

Buj k K̄z̄j̄ `x̄ c̄j̄ȳ Df̄q̄ c̄K̄vi gv̄QB̄ ǰē`ḡv̄b̄ | Z̄te `x̄ gvt̄Qi t̄P̄t̄q̄ c̄j̄ȳ gvt̄Qi m̄SL̄`v̄ tewk̄ | c̄j̄ȳ I `x̄ gvt̄Qi Ab̄s̄v̄Z̄ 1t0.9 | `x̄ Buj k gv̄Q̄ c̄j̄ȳ Buj k gvt̄Qi t̄P̄t̄q̄ `z̄ eāB̄k̄j̄ Ges Av̄K̄v̄t̄i eo n̄q̄ | Buj k m̄v̄avi ȲZ̄ GK̄ eQi eq̄m̄ n̄Z̄ c̄wīc̄`Z̄v̄ j̄v̄f̄ K̄t̄i | Av̄K̄vi t̄f̄t̄` Ḡt̄`i ǰW̄ḡ av̄i Ȳ ǰ̄lḡZ̄vi Z̄vi Z̄ḡ` N̄t̄Ū _v̄t̄K̄ | ḠK̄ūI eo Av̄K̄v̄t̄i i Buj k m̄t̄ǰ̄P̄ 20-30 j̄ ǰ̄ ǰW̄ḡ av̄i Ȳ K̄it̄Z̄ c̄v̄t̄i | eQ̄t̄i i `ǰ̄ ǰēt̄k̄l̄ mḡt̄q̄ h̄_v- t̄m̄t̄P̄`t̄ I Āt̄±vei Ges R̄iv̄s̄v̄ix̄ t̄`t̄K̄ ḡv̄P̄`ḡv̄t̄m̄ c̄wīc̄` Buj t̄ki c̄c̄Z̄v̄i n̄vi m̄ēt̄P̄t̄q̄ tewk̄ | Buj k gvt̄Qi c̄R̄bb̄ K̄v̄j̄ t̄K̄ 2ūI c̄āv̄b̄ f̄v̄t̄M̄ f̄iv̄M̄ K̄iv̄ t̄h̄t̄Z̄ c̄v̄t̄i | h̄_v- M̄īš̄K̄v̄j̄x̄b̄ c̄R̄bb̄ K̄v̄j̄ R̄j̄v̄B̄ t̄`t̄K̄ Āt̄±vei ch̄š̄f̄ Ges k̄x̄Z̄K̄v̄j̄x̄b̄ c̄R̄bb̄ K̄v̄j̄ R̄iv̄s̄v̄ix̄ n̄Z̄ ḡv̄P̄`ch̄š̄f̄ |

Buj k gvt̄Qi c̄R̄bb̄
K̄v̄j̄ t̄K̄ 2ūI c̄āv̄b̄ f̄v̄t̄M̄
f̄iv̄M̄ K̄iv̄ t̄h̄t̄Z̄ c̄v̄t̄i |
h̄_v- M̄īš̄K̄v̄j̄x̄b̄ c̄R̄bb̄
K̄v̄j̄ R̄j̄v̄B̄ t̄`t̄K̄ Āt̄±vei
ch̄š̄f̄ Ges k̄x̄Z̄K̄v̄j̄x̄b̄
c̄R̄bb̄ K̄v̄j̄ R̄iv̄s̄v̄ix̄ n̄Z̄
ḡv̄P̄`ch̄š̄f̄ |

cRbb I wKtkvi Bij tki wePiY tqt

thtnZzBij k GKwU AwfcqvbKvix gvQ (Migratory fish) ZvB mWKFvte Gi cRbb tqt
wbYq Kiv tek KwWb| wefbrZt`i wfiEtZ ersj vt`tki wefbrb`-b`x I tgvnbvq wbrj wLZ
`vbmgn cRbb tqt I wKtkvi Bij tki wePiY tqt wntmte wPvYZ Kiv nq|

1) cUv AeemKv

elPtgSmtg cUv b`xi AwvPv, tMqvj>`, cvKuk, tMv`vMvov, gyMA I tjSnRs Astk cPz
cwi gvY cwi c° Bij k gvQ cvlqv hvq| cUv b`xi gyMA t`tk iiyKti tMqvj>-AwvPv
Astk Rvbgvix ntZ tg gvm chSP2 t`tk 12 tm.ug. AvKvtii wKtkvi Bij k (RvUKv) cPz
cwi gvY aiv cto|

2) tgNbv AeemKv

tgNbv b`xi NvUbj ntZ Pvucj Ges Pvucj ntZ nvrXgviv bij Kvj Astk cUq mivv eQiB
cwi c° Bij k gvQ aiv cto| gvP°Gucj gvtm tgNbv b`xi tgvnbvq, Pvucj, bij Kvj Astk
mwaK RvUKv aiv cto|

3) wPvYZ AAj i b`x I b`xi tgvnbv

hZ`f-mae Rvbr hvq Bij k gvQ mgj`wWg Qvto bv| cUqvLvj xi KqvKvUv mgj`mKZ ntZ
Ljvbi`vj vi Pi chSPmgj`Zxi eZr°Gj vKvK RvUKv Bij tki wePiY tqt wntmte wPvYZ Kiv
ntqtQ| G Gj vKvq RvUKv aiv mgq Kvj btf` t`tk tdeyvi x chSP| GQvov epEi ewi kvj
tRjvi wvLvj x, cvqiv, bqvfvsMj x I Bij k b`x Ges wvRjv, gjw I tgvn`wMA DctRjvi
ga`w`tg cUvntZ tgNbv kvLv b`xmgfn e`vcK nvti RvUKv aZ ntq`vtK|

cUqvLvj xi KqvKvUv mgj`
`mKZ ntZ Ljvbi`vj vi
Pi chSPmgj`Zxi eZr°
Gj vKvK RvUKv Bij tki
wePiY tqt wntmte wPvYZ
Kiv ntqtQ|

Bij tki Lv`

Bij k gvQ gj-Z cUvUbtfvRx| Giv cwbZt we`gvb qjz`qjz` AvYq`wK Rxe thgb DvM°
cUvUbtv gta` bx I meR tkIjv, WvqvUgm&Ges RyvcUvUbtv gta` KwctcW, K`vWvmtiv,
tinvUtdiv, tcvUvRvqv BZ`w` tLtg`vtK|

Bij k gvQ i ÷K ev RvZ wbYq

Bij k gvQ i `RueK e`e`vcvvi Rb` RvZ ev ÷K wbYq AZxe`iZcy°KvR| AvyUv ev
chfe`qjYi gva`tg chS- Bij k gvQ i `Uv ÷K kvv³ Kiv ntqtQ| Zb#a` GKwU b`xi
÷K/im Ges AcivU mgj`i ÷K/im|

Bij k gvQ i e`e`vcv

Dctii Avtj vPbv ntZ t`Lv hvq`Q th, Bij k GKwU AwfcqvbKvix gvQ| Giv Lv`i AtsttY
Ges wWg Qvovi Rb` mgj`ntZ b`xtZ Awfcqvb Kti Ges t`tki wefbrb`-b`xtZ Lv` MhY
Kti| wKtkvi Bij k 5-6 gvm eqm chSPwefbrb`-b`x I tgvnbvq Ae`vbi ci cyivq mgj`
Awfcqvb Kti| mgj`ntZ b`xtZ AwfcqvbKvj xb mgtq, cRbbKvj xb mgtq Ges wKtkvi
Bij tki (RvUKvi) Pvi YKvj xb mgtq ersj vt`tk Bij k I RvUKv aiv nq|

G tcvUvntZ Bij k gvQ i mgz`RueK e`e`vcvvi Rb` wbrwZ c`tqjC MhY Kiv GKvš
Aciv nvh°

(K) Awfcqvb c_ gY ivLv

evsj vt`tk Bij k gvQ aivi mgq newfbabBij tki gY cwi agY c_ eU Kiv nq ev etavi mpoKiv nta _vtK| th mg`l cStq Bij k gvtQi cwi agY c_ gY ivLv thtZ cti Zvi gta` ewYZ cXWZ cAb|

(L) b`xtZ AvovAwofite ˘wcZ eta Rvj evMvov Rvj ibqSYKiY

MteI Yiq t`Lv tMtQ th, eQti i newfbangtq newfbagjvKiv, wetkl fite i`® tgSmjg emi kvj tRjvi tgnw`MA, wRjv I gjw`_vbi newfbab`-b`xtZ, cUv b`xi gvlqv, fvmKz, Ami Pv GjvKiv Ges elP tgSmjg tbiqvLvj x tRjvi ivgMwZ, Kwj MA GjvKiv Ges j`qxcy tRjvi nvrXgvi v GjvKiv w`tq cEwnZ tgnbv b`xtZ GKcSl ntaZ Acic Sl chSP AvovAwo evka I Rvtj i teo w`tq eta Rvj evsMvov Rvj w`tq Bij k aiv nq| Dctiv³ Dcvtaq aivi dtj Bij tki Awfcqvb c_ cUq eU nta hvq| dtj chvB cwi gvtY Bij k b`xi Dcti i Astk Avni tYi cwi gvY w`b w`b Ktg hv`Q| Bij k gvtQi mgye`e`vcbvi Rb` mg`lcKvi eva Rvj ev Mvov Rvj w`tq Bij k aiv eU Kiv Avek`K|

(M) DcKj xq GjvKiv gvQ aivi Rvj I tbSKvi msL`v ibqSYKiY

t`tki newfbab`-b`xi bre`Zv nwm cvl qvi dtj Bij k gvtQi Ae`vb b`-b`xi Dcti i Ask ntaZ tgnbv Ges DcKtj w`b w`b mti hv`Q| dtj AwKvsk tRtj b`xi tgnbv I DcKj xq GjvKiv gvQ aivi Rb` Ae`vb ibt`Q| G tcl`tZ b`xi tgnbv I DcKj xq GjvKiv gvQ aivi tbSKv AwZ `z ewx cvt`Q| Duj mLZ GjvKiv wetkl Kti RjvB ntaZ At`vei gvtm cUz 5-7 wglvi ASli ASli tRtj iv Rvj tctZ _vtK| DcKj xq GjvKiv AwKvsk Bij k gvQ aivi tbSKv hSPwv Z Ges Rvtj i `N® I cU`LgB tenk| D³ GjvKiv mnbkxj gvIvi tPtq AtbK tenk Rvj tdjvi dtj Bij k gvtQi cwi agY c_ gY ivLvi Rb` DcKj xq GjvKiv gvQ aivi tbSKvi msL`v I Rvtj i cwi gvY ibqSY Kiv Avek`K|

(N) DcKj xq GjvKiv I t`tki Af`sti e`euZ Rvtj i dW ibqSYKiY

DcKj xq GjvKiv I newfbab`-b`xtZ 30-47 tm.wg. AvKviti i gvQ mvari YZ tenk aiv cto| D³ AvKvzi (`tN®) gvQ aivi Rb` 9-10.2 tm.wg. dWmi Rvj cUqvRb nq| G tcl`tZ 9 tm.wg. Gi wbaclWmi Rvj Bij k gvQ aivi wbgte`e`envi mgMt`tk wbl x Kiv Avek`K|

(O) t`tki newfbab`-b`xi bre`Zv ibqSYKiY

fvi tZi Mzv b`xi Dci diviv`v bvgK`v t`b evtai dtj cUv b`x I Gi newfbacKvLvi bre`Zv eUj vstK nwm tctqtQ| GQvov Ab`vb` b`-b`xl DRvb ntaZ cEwnZ cuj Rtg b`x, tjv w`b w`b bre`Zv nvi vt`Q| dtj Bij k gvtQi AtbK cRbb t`qI bÓ nta`Q Ges wePi Y t`qI w`b w`b cwi ewZ nta`Q| Bij k gvQ mvari YZ cEj tmtZ I Mfxi b`-b`xtZ Awfcqvb Kti _vtK| Gfite t`tki newfbab`-b`x μgvMZ fivU ntaZ _vKtj Ges cwb cEvn nwm tctZ _vKtj Bij k gvtQi cwi agY c_ I w`b w`b tQvU ntaZ _vKte| Rvbr hvq Bij k gvQ GKmgq b`-b`xi tgnbv ntaZ myi- 1300 wK.wg. `ieZx`Mzv b`xi AvM® Ges w`j` chSP Ges e`cy b`xi tZRcy (evsj vt`k eW® ntaZ 306 wK.wg.) chSP Awfcqvb KiZ| ZvB Bij k gvtQi gY cwi agY c_ eU ntaZ GKw`tk thgb Gi Drcv`b nwm cvl qvi m`vebr AvtQ Ab`w`tk AwKZi bre` Astk (thgb fvi Z ev gvqvbgvti i newfbab`-b`xtZ) G gvtQi Awfcqvtbi m`vebr AvtQ etj msik- ó weAvbx`i avi Yv| ZvB Bij k gvtQi Drcv`b A`q`wv vLv Z_v ewx i j`q` evsj vt`tki newfbab`-b`xi bre`Zv ibqSY Kiv AZxe Rvjtj |

Bij k gvQ mvari YZ cEj tmtZ I Mfxi b`-b`xtZ Awfcqvb Kti _vtK| Gfite t`tki newfbab`-b`x μgvMZ fivU ntaZ _vKtj Ges cwb cEvn nwm tctZ _vKtj Bij k gvtQi cwi agY c_ I w`b w`b tQvU ntaZ _vKte|

(P) mtePP cRbb Kutj Bij k gvQ aiv ubil xKiY

Avgt`i t`tk Bij k gvQi kxZKvj xb Ges M^oSKvj xb`GU c^ovb t^osmg i tqtQ| D³ `GU cRbb t^osmgi gta` tmtP^o I At^ovei gvtm nmZqv, m`xc I gbcjvi Kvj i Pi bvgK`v`b Bij k gvQ mtePP cwi gvty cRbb Kti`vK| uKŠ`Dij - uLZ cRbb Kij xb mgta e`vcK fite Bij k gvQ aivi dtj Zv`i cRbb e`vnZ nq| G tclm^otz Bij k gvQi Avea cRbtbi Rb` eivZ`v`b tmtP^o At^ovei gvtm gvQ aiv ubil x Kiv ntj Bij k gvQi c^oKuZK gRZ` c^oqv Avea I Ae`vnZ`vKte| dj k^oz`tz t`tki Bij k Drcv`b epx`v`te|

(Q) RvUKv ubab tivaKiY

tgNbv b`xi IvUbj ntZ Pu`cj, nvRigvivi bxj Kgj Astk Ges DcKj xq GjvKvq`v`vj vi Pi ntZ KqvKvUv chS^o RvUKv gvQi`GU epr mePiY t^oq^o kv³ Kiv ntqtQ| D³ GjvKvq h`v^otg mltm^oat-tg gvtm Ges mltm^oat-Rvbyvi x gvtm mevfbaRvj`v`tg e`vcK fite RvUKv aiv nq| Bij k gvQi c^oKuZK gRZ` c^oqv Avea I ubi meQbeivLvi Rb` eivZ`v`vj GjvKvq RvUKv aiv eU` Kiv Avek`K| KvhRi fite RvUKv ubab tiva Kivi Rb` D³ GjvKvK RvUKv gvQi Afq-Avkt^o vntmte tNvl Yv Kiv ntj t`tk Bij k gvQi Drcv`b e`vcK fite epx`v`te| Acic^o c^oKuZK gRZ` c^oqv Ae`vnZ`vKte|

Dcmsnvi

cwi tekMZ cwi eZ^obi Kiv tY evsj vt`tki b`-b`x mgtn Bij k gvQi cRbb I mePiY t^oq^o vPi Zti nvi t^oq tmtQ Ges G gvQi Ae`vb mgvMZ mgj`i`v`K mti hv`Q| Acic^o c^oq, Bij k GKvU t`kvli c^oKuZi gvQ meavq mevfbaeb`-b`xtZ AvovAvio evar`v`tg G gvQi`v`vmeK Pj v^otj meNem^oo Kiv nt`Q| GQovov c^oZ eQiB tgNbv b`x I DcKj xq AAj t`K j`j`j` RvUKv aivi dtj Bij k gvQi c^oKuZK gRZ` c^oqv e`vnZ`v`nt`Q| Dch^o c^oqv Ae`vnZ`vKtj AvMqxtZ Bij k gvQi mnbkxj Drcv`b nrm cvl qvi mgr`m^obebr AvtQ| G tclm^otz Bij k gvQi Drcv`b epx`v`i j`j`j` m^oze`e`vcbvL Zvi ev`evqb Kiv Avek`K|

tgNbv b`xi IvUbj ntZ Pu`cj, nvRigvivi bxj Kgj Astk Ges DcKj xq GjvKvq`v`vj vi Pi ntZ KqvKvUv chS^o RvUKv gvQi`GU epr mePiY t^oq^o kv³ Kiv ntqtQ|



mvi gg^ot tctb gvQ Pvl c^oxvZ Rvcvrb c^og c^ohvi jvf Kti| thme epr Rjvkqtk mvari Yfite ubieo gvQ Pvti Avl Ziq Avbr m^oe br tmme Rjvktq tctb gvQ Pvl Kiv m^oe| tctb 6 t`K 7 gvtmi gta`B evRv^o i Pvn`vgZ me^oqthvM` gvQ Drcv`Z nq| Bij k GKvU Avfc^oqvKvix gvQ (migratory fish)| G gvQ gj-Z c^ovUbtFvRv| DcKj xq GjvKvq Ges mevfbaeb`-b`xtZ 30 t`K 47 tmvUingUvi AvKv^o i gvQ mvari YZ teik aiv cti| c^oZ eQi tgNbv b`x I DcKj xq AAj t`K j`j`j` RvUKv aivq c^oKuZK gRZ` e`vnZ`v`nq| mevfbaeb` e`e`vcbv tKŠkj thgb- Avfc^oqv c_ (migratory route) g^ov`ivLv, gvQ aivi Rvj, tbsKv ubqŠy, mtePP cRbbKvtj gvQ aiv ubil xKiY Ges RvUKv ubab tiva Kti Bij tki Drcv`b epx`v` Kiv m^oe|



cuVvEi gj'iqb 8.2

mWk DEti i cuK Wk Py (✓) w b/

- 1/ tctb gvQ Prl ej tZ Wk eSvq?
 - K) tQvU cKzi gvQ Prl
 - L) gi v b`xtZ gvQ Prl
 - M) Lvij gvQ Prl
 - N) epr Rj vktq teov w`tq tNi v RvqMvq gvQ Prl

- 2/ tctb Kgct¶¶ tKvb&AvKvti i tcvbr Qvov DvPZ?
 - K) 5 tm.ug.
 - L) 10 tm.ug.
 - M) 7 tm.ug.
 - N) 8 tm.ug.

- 3/ RvUKv Bvjj tki AbZg epr wPvY t¶¶¶ tKvbuU?
 - K) cvvZb e²cŷ b`
 - L) kvZj ¶¶v b`x
 - M) tgNbr b`x
 - N) Ksk b`x

- 4/ GKvU Bvjj k gvQ m¶¶¶ KZvU WvG w`tZ cvti?
 - K) 20-30 j ¶¶
 - L) 20-30 nvRvi
 - M) 20-30 tKvU
 - N) 40-50 j ¶¶

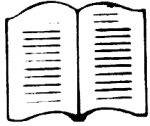
e`enwiK

cW 8.3 cKzi i AvqZb Ablyqx tcvbri cwi gvY I AvbzwZK nvi ubaY



G cW tkfI Avcb -

- cKzi i AvqZb Ablyqx tcvbri cwi gvY I AvbzwZK nvi ubaY KiZ cwi teb|



ckæ 1| hir` cZ kZvsfk 70-80u _vB mi cwi tcvbri Qvor nq| Zvntj GK tn+i AvqZtbi GKiu cKzi KZiu tcvbri Qvor hvte?

mgvaib t

247 kZvsfk 1 tn+i

mzi vs 247 x 70 - 80u tcvbri

A_# 17,290 - 19,760 u tcvbri Qvor hvte|

GKB hvte Avgiv tZj mcqv I gv_ i gvQi tcvbri Qvori nvi nmve KiZ cwi |



Ablyj b (Activity) t tctb cZ tn+i 17,500 - 25,000u tcvbri Qvor thZ cwi thLvrb i B, KvZj v, gMj, mj fvi Kvc^Q Kwic^P gvQi AbzvZ nte h_vutg 30:20:10:10:30| 2 tn+i AvqZb wekó GKiu tctb Duj - uLZ gvQmgfni tKvbwi KZiu QvoZ nte Zv nmte Kti LvZvq ij wce x Ki y Ges mgggZ Avcbri uDUi tK t`uLq` rji vbb|

Povšgjiqob 8



msw7B I i Pbigj-K ckae

- 1/ cki _vB micw ev ivRcyi Pvl cxiZi eYv w`b/
- 2/ cki tZj wvcqv Kxfite Pvl Kiteb eYv Kily/
- 3/ AvcdKvb gv, i Pvl i mjev, tj v wj Lj/
- 4/ wRlj gvQi `ewko, tj v wj Lj/
- 5/ Kxfite wRlj gvQi Pvl Kiteb eYv Kily/
- 6/ tcb gvQ Pvl i Kj v-ikSkj eYv Kily/
- 7/ Bwj k gvQi RxebPw eYv Kily/
- 8/ Bwj k gvQi e`vcbv cxiZi eYv w`b/



DËi gvjv

cW 8.1

1/ L 2/ K 3/ K 4/ N

cW 8.2

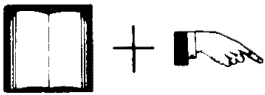
1/ N 2/ L 3/ M 4/ K

BDibU 9 grm" cRbb

cRbb GKIU "RieK cLmuqv hvi gva"tg Rxe wej ʒ nI qv t_ʒK i ʒIv cvl qvi Rb" GKB aiʒbi eskai "Zwi Kʒi | gvtʒi tʒʒtI Gi e"iZµg bq | gvQ thʒb c×iZʒZ cRbb Kʒi _vtK | mdj fite gvQ Pvl Kivi Rb" gvtʒi cRbb m=utK"mʒuó avi Yv _vKv cLqvRb | grm" cRbb m=utK"mʒuó avi Yv _vKʒj mWVK mgtq KwOLZ cRmZi KwLZ AvKvʒi i tcvb cLb ev msMh Kiv mnRZi nq | Awakvʒi KwOLZ AvKvʒi i KwOLZ cRmZi tcvb cvl qvi Rb" gvtʒi cLym Z cRbb NUvʒv cLqvRb | n"vPmi "vcb Kʒi gvtʒi cLym Z cRbb Kiv ntq _vtK | cLym Z cRbb m=uv`ʒbi Rb" cRbbʒg gvQ ubevPb, Gt`i jvj b cvj b c×iZ, ucUBUvix Mš` msMh, msi ʒY, niʒgv BʒRKkb "Zwi I cLqm c×iZ Ges Wvg dʒʒʒvri cLmuqv m=utK"Avb _vKv Avek`K | GQvovl tcvb c"mKs I cwi enʒYi AvaybK chʒʒ m=ʒU avi Yv _vKv cLqvRb |

G BDibU grm" cRbb Kx, cRbʒbi cKvif` Ges Zvi cLqvRbʒZv, cRbbʒg gvQ gRʒ Kivi wbgvejx, ucUBUvix Mš` msMh, msi ʒY Ges niʒgv BʒRKkb "Zwi I cLqm c×iZ, Wvg dʒʒʒvri cLmuqv, dʒʒʒvri cʒveKmgʒ Ges dʒʒʒvri wevfbœcvʒtI e"envi, cLkwZK Dm t_ʒK tcvb msMhni c×iZ, tcvb tUKmBKiy c"mKs cwi enY Ges AvaybK chʒʒ i cLqm BZ"m m=utK"ek` fite Avʒj vPbv Kiv ntqʒ |

cW 9.1 grm" cRbb Kx? cRbʒbi cKvif` Ges Zvi cLqvRbʒZv



G cW tʒtI Avicb –

- grm" cRbb Kx Zv RvʒZ cviteb |
- cLkwZK cwi tʒtK gvQ Kxfite cRbb Kʒi Zv eYv KiʒZ cviteb |
- cLym Z cRbʒbi msAv wj LʒZ cviteb |
- cLym Z cRbʒbi KʒvʒKʒj eYv KiʒZ cviteb |



grm" cRbb Kx?

cRbb GKIU "RieK cLmuqv hvi gva"tg Rxe wej ʒ nI qv t_ʒK i ʒIv cvl qvi Rb" GKB aiʒbi Rxe ev eskai "Zwi Kʒi | gvQ thʒb c×iZʒZ cRbb Kʒi _vtK | cLZiu gvQ GKIU wv" ʒ cRbb Pµ Abʒi Y Kʒi Ges Abʒe Kʒi |

cRbb GKIU "RieK cLmuqv hvi gva"tg Rxe wej ʒ nI qv t_ʒK i ʒIv cvl qvi Rb" GKB aiʒbi Rxe ev eskai "Zwi Kʒi |

mvariYZ gvtʒi gʒa` cʒj I "x` ʒj wj ½ we`"vgv | cRbb tʒʒmʒg cwbʒZ "x gvQ Wvg Ges cʒj gvQ i µvYyʒ Kʒi | dtj gvtʒi Wvg emv`Kfite (t`ʒni evʒti) wvwl³ nq | tenki fiv gvQ eQʒi GKevi cRbb Kʒi _vtK | Zte wKQymKQygvQ AvʒQ thgb KwvcP I tʒj wvcqv, eQʒi GKwaKevi cRbb Kʒi _vtK | gvP`_ʒK i iyKʒi AvM÷ gim chʒcRbbKij we`Z | Zte tg, Rʒj I RʒjvB gim evsʒv`ʒki gvtʒi cLvb cRbb mgq | cwbi ZvcgvIv, Avʒj vi ZxeZv I Kij (w`ʒbi "N), tmʒZ BZ"m cʒveKmgʒ gvtʒi cRbb wqʒʒ Kʒi |

cRbʒbi cKvif`

gvtʒi cRbbʒK cLvbZ "ʒj fivM fivM Kiv hvq | h_v -

- 1 | cLkwZK cRbb (Natural breeding)
- 2 | cLym Z cRbb (Induced breeding)

Kul. I cij Dbqb ˘z

1| gvtQi cKuzK cRbb

iB, KvZjv I gMj gvtQi cKuzK cRbb

K) b`xZ gvtQi cRbb

iB, KvZjv I gMj gvtQi cAvb cKuzK Dm b`x t`K cKzi Pvl Kievi Rb` tcvb mslpxZ nq| elRvtj b`xZ iB, KvZjv, gMj gvQ cRbb Kti _vtK, gvP@gvm t`K cUq tmtp`at gvm chSf b`x t`K tcvb mslpxZ nq|

cRbtbi cKuzK KviYmgp

b`xZ cRbb tKvb wtkl cKuzK KviYi Dci wbfP Kti Zv mWk fite Rvbv hvqub| Zte bvbvi Kg `eAmbK mgvTlv t`K Absvib Kiv nq th elR mgta b`xZ hLb Rj Uuz nq Ges ZLb b`x t`K Rvj w`ta ti Yvtcvb tenk mslpxZ nq| wtkl Kti b`xi cmb hLb KgZ _vtK ZLb ti Yvtcvb tenk aiv cto| elR mgta b`xi Rj tNjv nq, Nb Nb elR dtj b`xi cmbi imvqubK cwi eZB nq| cmbi Zvcgvl, `exfZ Av` tRtbi cwi gvY BZ`w i cwi eZB nq| elvP mgq we`yr PgKvrbv, evRcov Lv NbNb nq| Gme cKuzK NUBvi mgvtek cRbtbi mnvqK nZ cvti | GQov th mg`l gvtQi cKuzK cRbtbi Rb` tmZi `i Kvi nq elvRvtj b`xZ tmZi teM teto hvq| AZGe b`xZ elRvtj xb th cKuzK cwi eZB `vfwefite nq, tm Avenl qv I cwi tek iB, KvZjv, gMj gvtQi cRbtbi Rb` Abkj- nq|

b`xZ elRvtj xb th cKuzK cwi eZB `vfwefite nq, tm Avenl qv I cwi tek iB, KvZjv, gMj gvtQi cRbtbi Rb` Abkj- nq|

L) eda cRbb

`vite eda iB, KvZjv, gMj gvtQi cRbb Kivrbv hvq

mvieQi cwb _vtK GiKg eza

G iKg eda AvtM t`K cRbb DcthvMx iB, KvZjv, gMj gvQ cvj b Kiv nq| elvP mgq we`Z.DPzRvqMv t`K Xj bvtg| eda cwb cletki Ges cwb wv`vkb Rb` gj _vtK| elR mgta edai wFzi cwb Rtg eza cmbtZ fuz`ntq hvq| evowZ cwb wv`vkb Kti t`qv nq| cRbtbi mgq gylU edki teor w`ta AvUvKvrbv _vtK| edai AMfxi Astk cRbb ntq _vtK|

iKtbr eza

iKtbr eda elvP cmbi Xj bvtg| exnU cwb cY`ntj cRbb DcthvMx iB, KvZjv, gMj BZ`w gvQ Qov nq| G iKg eda elR cmb Rgv nI qvi ci cRbb nq| mvavi YZ me edaB cKziUi tgSi weivU MZ`Pvi cvtK, AfbKuv RvqMv _vtK| gvtQi cRbb GiKg AMfxi RvqMv nq| eo eda cRbb cKuzK fite nq| eda Qvoeri ci elR mgta iB, KvZjv, gMj gvQ tRvti cwb Avt`vuj Z Kti | `xgvQ I cijy gvQ tQvUvQv Kti I ci`uti i KvQvKvQ ntq RovRwo Kti | Zvt`i cEj DfERbv t`Lv hvq| gvQt`i thSbmqv AfbKTY ati Pij | Gme cRwzi `xgvQi tctUi wlg thSbmqv cmbtZ tei ntq Avtm| cijy gvtQi i`m I cmbtZ wvMZ nq Ges wlg, tjv cmbtZB i`m 0viv wvwl 3 nq|

2| gvtQi cYw Z cRbb

iB, KvZjv, gMj gvQ ex Rj vktq wlg Qvto bv, hw`l elvRvtj `xgvQi D`i wlg cY`_vtK| cijy gvtQi i`mvbynq, wKŠ` GB cwi tek cRbb nq bv| gvtQi wCUBUvix MŠi wvhw ev nitgvb cRbb DcthvMx `x I cijy gvQtK BbtRKkb t`evi cti `x gvQ wlg Qvto I cijy

gvtQi wUBUvix Mšiši
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gvQtk BbtRkKb t`eri
cti x gvQ wlg Qvto l
cjtj gvQ i muYybtjlc
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Kti | G fite ni tgvb
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cRbb etj |

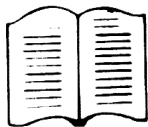
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nq ZvtK cYw Z cRbb etj |

ni tgvb BbtRkKb mrvth` Avgt`i t`tk mePB GLb iB, KvZjv, gMj gvtQi Kwlg
cRbb NUvtrv nq| me`kx KvcRvZiq gvtQi gta` Kwcp gvQ (Cyprinus carpio) ex
Rjvktq eskwe`-vi KitZ cvti | tmRb` G gvtQi cYw Z cRbtbi cQvRb nq bv| wKŠ
wvj fvi KvcRl Mhm Kvtp eskwe`-vi m`uYvte cYw Z cRbb cxwzi lci wbfkxj |
eZgvtb wRlj gvQ mekl Kti gv, i gvQ Pttli chvi Y NtUtQ| GtjtTl cYw Z cRbtbi
KjtKŠkj cQvM Kti tcvb Drcv`b Kiv nt`Q| cKwZK cwitetki evBti cYw Z cRbb
m`e |

cRbtbi cQvRbxZv

- cRbb GKw Rwek cluqv| cZw Rvte b`vq gvQl esk i qv Kivi Rb` rfmek
wbqtg cRbb Kti _vtK |
- gvQ Pvl KitZ ntj cktzi cQvRbxq cwi gvtY tcvb gRy KitZ nq| Avgt`i t`tki
iB KvZjv RvZiq gvQ tkej gvT tmZkxj b`xZ cRbb Kti _vtK | Gme gvQ Pvl
KitZ ntj b`x t`tk tcvb mslm` KitZ nq| wwfbaKvi tY KvcRvZiq Gme gvtQi
cRbb tjt webó nt`Q| dtj cKwZKfite tcvb Drcv`b AtbK Ktg tmTQ| chfB
cwi gvtY tcvb tctZ ntj iB-KvZjv RvZiq gvQtk ZvB cYw Z cRbb KivZ nq |
- b`x t`tk mslm`xZ tcvb Amberh`Kvi tYB wK` cRwzi ntq _vtK, AtbK mgq tKvb
tKvb AemAZ mekl Kti ivjtzm gvtQi tcvb GKb mvt_ aiv cto th, tjv gvQ Pttl
qWZKi cFve dtjt | tmRb` KwOŁZ cRwzi tcvb tctZ ntj Aek`B cYw Z
cRbtbi cQvRb itqtQ |
- iB-KvZjv gvQ hZ eob tnvK bv tKb ex cktzi cRbb Kti bv| cRbb qvg gvQ cktzi
gRy titL cRbb tgsmtg th tKvb mgta cQvRb gmdK tcvb cvl qvi Rb` cYw Z
cRbb cQvRb |
- b`x t`tk mslm`xZ tcvb clqkB wK` AvKvti ntq _vtK | gvQ Pttl Awk mglj tctZ
ntj tKvb ubw` cktzi GKb AvKvti tcvb Qvov DvPZ | GKb eqtmi l GKb
AvKvti tcvb cvl qvi Rb` l cYw Z cRbb `i Kvi |
- wks, gv, i, KB, cve`v BZ`w` AZ`šl mYr` yvQ Pvl GLb jvFRBk wntmte wetePZ |
wKŠ` Gme gvtQi tcvb cKwZtZ Lg KGB cvl qv hvq | KvtrB G RvZiq AZ`šl i žcY`
gvQ Pttl chvi NUvZ ntj Aek`B cYw Z cRbb cQvRb |
- gby` mP l Ab`vb` wwfbaKvi tY `emi cwitetki Rb` Avtk gvQ wejB nl qvi ct_
thgb- gvtkij gvQ | gvtQi wejB ni vZ ntZ i qv Kivi Rb` cRbb cQvRb |

KwLZ cRwzi GKB
AvKvti i, GKB eqtmi
Dbzgvbtbi tcvb mgqgZ
cvl qvi Rb` cYw Z
cRbb cQvRb |



mvigg` cRbb GKw Rwek cluqv hvi gva`tg Rxe wejB nl qv t`tk i qv cvl qvi Rb`
GKB aiBti Rxe ev eskai `Zwi Kti | gvtQi cRbb `gaitbi h_v- cKwZK cRbb l
cYw Z cRbb | gvtQi wUBUvix Mšiši ubhfm ev ni tgvb cRbb Dcthm x l cjtj gvQtk
BbtRkKb t`qvi cti x gvQ wlg Qvto l cjtj gvQ i muYybtjlc Kti wlg, tjv ubw³
Kti | Gfite ni tgvb BbtRkKb w tq th cRbb Kiv nq ZvtK cYw Z cRbb etj | KwLZ
cRwzi, GKB AvKvi l GKb eqtmi cQvRbxq cwi gvtY Dbzgvbtbi tcvb h_vmgta cvl qvi
Rb` cYw Z cRbb cQvRb |



cvVvEi gj'iqb 9.1

mwK DEti i cvk UK Pý (✓) w b |

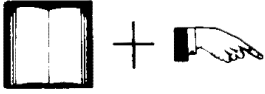
- 1/ cYw Z cRbibi mear tKvbu?
 - K) mviv eQi cRbb Kivtbr hvq
 - L) th tKvb gvtQi mvt_ th tKvb gvtQi cRbb Kivtbr hvq
 - M) rfwek evm vibi evBti cQ`gZ gvtQi cRbb Kivtbr hvq
 - N) thSb Acwi c° gvtQi cRbb Kivtbr hvq

- 2/ cYw Z cRbb Kiv nq tKvbu Ovi v?
 - K) ucUBUvi x Mš'i ubhfm
 - L) Bbmj b
 - M) tcvbmj b
 - N) vBi tqW Mš'

- 3/ cYw Z cRbb tKškj `i Kvi nq br tKvb&gvtQi tTtT?
 - K) KvZj v
 - L) mj fvi Kvc°
 - M) KvcP
 - N) gv, i

- 4/ iB, KvZj v gvtQi tTtT tKvbu mwK?
 - K) cKzi mvavi YZ wWg w tZ cvti
 - L) cKzi wWg t`q br Kvi Y thSb cwi c° Zv j vf Kti br
 - M) Awak epocvZ ntj cKzi wWg t`q
 - N) ni tgvb BbRKkb cQvM Kiti j wWg w tZ cvti

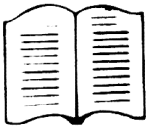
cW 9.2 cRbbŋlg gvQ gRZ Kivi wbgvej x



G cW tkłl Avcwb –

- cRbbŋlg gvQ i Rb` Kxfvte cKz wberPb Kiv nq Zv Avtj vPbv Ki tZ cvi teb|
- cRbbŋlg gvQ Kxfvte wberPb Kiv nq tm m`u`K`e`vL`v Ki tZ cvi teb|
- cRbbŋlg gvQ i cKzi Kxfvte mvi cŋqM Kiv nq Zv RvbtZ cvi teb|
- cKzi i cwb Kxfvte i ŋYvteŋY Kiv nq eYv Ki tZ cvi teb|
- cRbbŋlg gvQ tK Kxfvte m`u`i-K Lv` t`qv nq Zv e`vL`v Ki tZ cvi teb|
- cRbbŋlg gvQ i cwi c`Zv Kxfvte Zj wS`Z Kiv hvq eYv Ki tZ cvi teb|

cRbbŋlg gvQ gRZ Kivi wbgvej x



th tKvb gvQ we`kl Kti Kvc`RvZxq gvQ cRbtbi Rb` chw msL`K cRbbŋlg ev eY gvQ gRZ Kiv AZ`vek`K| Dbz Dcvtq gvQ Pvl Kiv Kwl g cRbtbi KgmP ev`evqtbi ceRZ` mWk ev fij vte Pvl Kiti eY gvQ Atc`ŋvKZ.AvtMB thsb cwi c`Zv jvf Kti, cRbbKvj `xN`vqx nq Ges AtbK mg`q GKB cRbb FZ`z GKwaKevi cRbb Kiv`bv hvq| mWk e`e`vcbv MhY Kiti t`kv Ges PvBubR KvtcP wKQy wKQygvQ Zuvor cwi c`Zv jvf Kti Ges tde`vix NgvP`gv`mB cRbb Kiv`bv hvq | H GKB gvQ tK 2N2.5 gym ci tg`NR`b Ges 3q evi AvM`-Ntm`b`v`ti cRbb Kiv`bv m`e| eY gvQ e`e`vcbv ej tZ w`v`j wLZ Kiv`v`xi mgw` eSvq |

th tKvb gvQ we`kl Kti
Kvc`RvZxq gvQ cRbtbi
Rb` chw msL`K
cRbbŋlg ev eYgvQ
gRZ Kiv AZ`vek`K|

- 1| cKz wberPb I cŋZKiY
- 2| gvQ i cRwZ wberPb, gRZKiY I i ŋYvteŋY
- 3| mvi cŋqM
- 4| m`u`i-K Lv` cŋqM
- 5| ni tgvb Bb`Rkktbi gva`tg cwi c`Zv Zj wS`ZKiY
- 6| cRbtb e`e`vZ gvQ cvj b|

cKz wberPb

ga`g AvKv`ti i cKz (0.5-1.0 tn±i) hvi Mfxi Zv 1.5-2.0 wgvUvi Ges AvqZvKvi Ges hvi cvo mg-Xvj Zv m`ube(2:1/3:2) cRbbKvix gvQ gRZ Kivi Rb` fij | cKzi i Zj t`ki gvu GtUj ev t`vAvk Ges Kv`vi cwi gvY 10-15 tm.wg. nI qv DvPZ| cKz tK m`u`Y`f`c i`Kv`bvi Rb` Dbz cvBwcs e`e`v`vKtZ nte| cKzi AS`Mvix I ein:Mvix cvBtci e`e`v`vKtZ nte hv`Z cKzi cwb t`qv hvq Ges cŋqvRtb Kgv`bv hvq| cKz eb`v I Liv t`tK i`ŋv cvl qvi e`e`v`vKtZ nte| cKz Ggb RvqMvq nZ nte thLv`b chw Avtjv evZv`mi e`e`v`vKtZ nte| cKzi i cwb i Zvcgv`v 27-32`tm. ntj fij nq| Dcti`vtj wLZ kZmgn`ci-Y Ki tZ cvi tj gvQ i thsbv`v`i ev` Zj wS`Z nq|

eY gvQ i cKzi i cwb i
Zvcgv`v 27-32`tm.
ntj fij nq|

eY gvQ wberPb, gRZ I i ŋYvteŋY

2-4 eQi eq`mi 1-5 tKwR I R`bi mY`v`m`ube`l wbtivM i`B, KvZjv, gtMj, wnj fvi Kvc` Ges Mm Kvc`m`vavi YZ eY gvQ wntmte wberPb Kiv nq| Zte KvZjvi t`ŋt`l 3-4 eQi eq`mi`x gvQ Ges 2-3 eQi eq`mi c`jy gvQ wberPb Kiti fij dj cvl qv hvq| c`jy Ges`x gvQ wfbw`v`b`e`Dr`mi nI qv D`Eg| m`vavi YZ At`v`vei gv`m eY gvQ gRZ i`i`ynq| wj 1/2 c`K Kiv m`e` ntj gRZ`KZ.gvQ`x I c`jy gvQ i Av`v`vZ 1t1 nI qv DvPZ| c`jy I`x gvQ tK wfb`e`

cRbbŋlg`x I c`jy
gvQ tK eY gvQ etj |

Kul. I cj. Dbqb ĩđ

wfbrečkzi ivLĭZ nte Ggb tKvb K_v tbB| Zte Gfite c_uK Kti ivLĭj cRbb cixŃvi mgq Gĭ i GĭK Acti i cĭZ AvKIŃ teŃo hĭq|

cĭZ tn±ĭi 1500-2000 tKwR eŃv gvQ gRĭZ KiĭZ nte| tKwR eŃv gvQ gRĭZ KiĭZ nte|

cĭZ tn±ĭi 1500-2000 tKwR eŃv gvQ gRĭZ KiĭZ nte| GKB cĭkzi wfbrečkzicRvZixq gvQ gRĭZ Kivi tŃŃĭ cmbi Dcwi ĩĭi Lv ĩ ĩhYKvix gvQ 40% (KvZjv 30-20; wnj fvi Kvc^o 10-20) + ga ĩ GĭvKvi Lv ĩ ĩhYKvix 30% (iĭ 20 I ĩhYKvix 10) + Zjĭĭki Lv ĩ ĩhYKvix 30% (gĭMj 20 I KwicŃ 10) nĭti gRĭZ KiĭZ nte| cĭkzi AvKw LZ cRwZi dvBĭUvc- vĭUĭbi NbZjhw tenk _vtK Zintj wnj fvi KvĭcŃ cwi gvY AvbĭwZK nĭti 10-20 fĭtM evovĭbv thĭZ cĭti Ges tmB mĭĭ_ KvZjvi cwi gvY 30 t_ĭK Kugĭq 20 fĭtM KgvĭZ nte| Avĭvĭ ĩ t_ĭki Rb ĩ Dcĭtĭj m LZ gvQ wbeŃŃb KiĭZ nte| GĭZ cĭkzi i cmbi wfbrečkz ĩĭi Lv ĩ eĭeÜZ nte I dj ĩĭĭc gvĭQi Rbbĭĭi eŃv ZiwsZ nte| cĭZ mBĭtn ev ĩ mBĭtn cĭkzi Rĭj tUĭb ĩĭZ nte| dtj gvĭQi kixi PPP nte Ges gvĭQi ĩĭfmeK ĩĭĭ Ges tMbvĭWi eŃv cixŃvi Kiv hĭte| tMbvĭWi eŃv I ci ĩĭĭ Kĭi gvQĭK wfbrečkz fĭM Kĭi wfbrečkz ĩĭvĭĭi Kiĭj fĭj dj cvlqv hĭq| Rĭj Urvvi mgq LĭB mZKZv Aej ĩb KiĭZ nte hĭZ tKvb fĭteB gvQ AvNvZ bv cvq| Rĭtj i dĭmi AvKvi nte 1x1 eMĭm.ig. | hw tKvb KvĭĭY gvĭQ ŃZ ĩ Lv hĭq Zintj 1 ĩc.ĩc.Gg. cUwKqig cvĭg vĭĭĭtĭU Ava NbUvi Rb ĩ tMvj Kwĭĭq Avei cĭkzi QvotZ nte|



Abĭj b (Activity) t aĭj, Avcĭb GKwU nĭvPwi ĩvcb Kivi K_v fĭvĭQb| H nĭvPwi i Rb 0.5 tn±ĭi GKwU cĭkzi eŃv gvQ gRĭZ Kivi Rb ĩ Pĭĭi KiĭQb| tmĭŃĭĭ tKvb&gvQ Kx cwi gvĭY gRĭZ Kiĭeb Zv ĩj Lĭj|

Re mvi I Pĭ cĭqM

eŃv gvĭQi cĭkzi gvQ gRĭZi wZb mBĭn cĭeĭtn±i cĭZ 20,000 tKwR tMvei ev tn±i cĭZ 10000 tKwR Kĭĭvĭ (Rĭgi ev Rj R AvMvQv I cĭYxi DĭvQo 1t1 AbĭvĭZ Ges kZKiv 1 fĭM Pĭ) mvi cĭqM KiĭZ nte| cĭwĭG mvi ĩ qvi GK mBĭn cĭeĭ200 tKwR/tn±i wnmĭte Pĭ cĭqM KiĭZ nte| GQvor cĭZgvĭm cĭZ tn±i 2000 tKwR tMvei cĭqM KiĭZ nte|

cmbi ĩ Yv, Y i ŃŃvĭteŃŃ

eŃv gvĭQi cĭkzi thĭnZabqwgZ tMvei mvi I mĭĭĭK Lv ĩ cĭqM Kiv nq tmRb ĩ Kvi I Kvi I gĭZ cmbi ĩ Yv, Y ĩwKgz iŃŃvĭteŃŃ KiĭZ bv cvĭĭj cĭkzi ŃwZKi Aeĭvi mĭo nĭZ cĭti hvi dtj tmLvĭb ĩwG Drcvĭb/eŃv cĭĭqv eĭvZ nĭZ cĭti| GB Aeĭvi Avĭ I AebĭZ nĭZ cĭti hLb cĭkzi i Zjĭĭk mĭĭZ AvZwi ĩ Re I A%Re cĭv_Ńmĭĭbv bv nq| Aeĭv Abĭvĭq cĭkzi i cmb cĭZ mBĭtn/ymBĭtn/gvĭm cwĭeZĭ Kĭi bZb cwĭvi I Av ĩRb mgx cmb cĭkzi cĭZ ĩvcb Kĭi GB Amĭear ĩ Kiv hĭq| mĭavi YZ cĭZevĭi cĭkzi i 1/8 nĭZ 1/4 fĭM cmb eĭjĭbv nq| Gfĭte cmb cwĭeZĭ Kĭi cĭkzi i cmbi Av ĩRb ĩĭZv ĩnq| cĭkzi i cĭjĭbv cmb tĭtj ĩĭq bZb fMf^o vĭUv cmb thĭM Kivi mgq j Ńĭ ĩvLĭZ nte hĭZ cĭkzi i cmbi Zvcgĭvi thb eĭvcK cwĭeZĭ bv nq| cĭkzi i cmb cwĭeZĭ GKw ĩK thgb cmbi AvĭcĭŃĭK cwĭevnĭZv Kugĭq ĩ q AbĭĭĭK cmbĭZ gŃ Avq b thgbĭ Na⁺, K⁺, Ca⁺⁺ I Cĭ Gi cwi gvY emotq ĩ q dtj tMbvĭWi cmb/Avq b mĭei v eŃv cvq hvi dtj tMbvĭWi eŃv ZiwsZ nq|

Wgl qjv gvtQi cKzi cZw b mbqgZ myg Lvevi w`tZ nte| Lvevti mbw`0 cwi gvY Dw`c I cYx tcUub, KvevBtWU I PveRvZxq Dcv`vb _vKtZ nte|

m=úíK Lv` cÓqM (Supplemental feeding)

Wgl qjv gvtQi cKzi cZw b mbqgZ myg Lvevi w`tZ nte| Lvevti mbw`0 cwi gvY Dw`c I cYx tcUub, KvevBtWU I PveRvZxq Dcv`vb _vKtZ nte| iB, KvZjv I gMj gvtQi cKzi Avav Kt=úv÷ Lvevi hvZ AaInx Pij I KjvB (1t1) 50%, %Lj-20%, tMvei- 20% I gvtQi _ov ev tikg tcvKvi KxU A_ev KmvBLvbi Dw`Qó- 10% w`tZ nte| Wgl Qvovi cti gym t_tK t`tni IRtbi 3-4% Lvevi w`tZ nte Ges Wgl Qvovi GK gym ce`ntZ 1-2% nvti Lvevi w`tZ nte| Zte cRbb Kivtvi GK mBvn AvtM t_tK Lvevi t`qv eU Kti w`tZ nte| Mm KvcPK Dnv`i t`tni IRtbi 1.5-2 _b ZvRv RjR Dw`c thgb nvBwJv, F`vuj mtbcqv, bvRim BZ`w` A_ev tbcqv Nvm Lvevi wntmte w`tZ nte| Wgl Qvovi cieZP gym t_tK Avevi Wgl t`qvi GK mBvn ce`chS Lvevi w`tZ nte| dvBtUvcwUub thgb w`úiybv, Avmtj Uviqv I tKvtjv Pvl Kti wnj fvi KvcPK t`qv thZ cvti| Wgl Qvovi cieZP gym ntZ cUg w`tK D`P nvti Lvevi t`qv nq hvZ gvQ `Z nvi vtv `f` wdti cvq Ges tMbvW ewx jvf KitZ _vtK| tMbvWi cwi c`Zvi mt_ mt_ gvtQi Lvevti cZ AvMh Ktg hvq ZvB tkfli w`tK Kg cwi gvY Lvevi w`tZ nq| Wgl Qvovi GK mBvn AvtM t_tK Lvevi mieiv eU Kti t`qv nq kixti PveKgvbvi Rb` hvZ gvQ Kulg cRbth fvj fite mvov t`q| AvZwi³ PveAfzjkb ev Wgl gy` ntZ cZeUKZvi mwj KitZ cvti| mwi lvi `Lj ev avtbi Kavi PvBtZ Zjvi weipi _ovi minZ wUvngb B thvM Kti Lvl qvtj tMbvWi cwi c`Zv fij nq| Kvi I Kvi I gZ KvZjv gvQtK`i ayavtbi Kav Lvl qvtj nitgvb BbtRkkbi cZ fvj mvov t`q| Zte myg Lvevi w`tj me mgqB fvj dj cvl qv hvq|

eY gvtQi cwi c`Zv ZjmsZKiY

Y eW gvtQi tMbvWi cwi c`Zv ZjmsZ Kivi Rb` uc.R. A_ev GBP, w, wR (H.C.G.) `eb mgq mgq BbtRkkb t`qv nq|

Y eY gvtQi tMbvWi cwi c`Zv ZjmsZ Kivi Rb` uc.R. A_ev GBP, w, wR (Human Chorionic Gonadotropin) `eY mgq mgq BbtRkkb t`qv nq| cwi c`Zv NUvtvi Rb` KvZjv gvQtK 3-4 ug. Mh/tKwR, iB, gMj I Mm KvtcP Rb` 2-3 ug. Mh/tKwR wntmte uc.R. Wtm=ft, Rvgyix I tdeyix grfm GKevi Kti BbtRkkb t`qv nq| GBP, w, wR, KvZjv gvtQi Rb` 5 ug. Mh/tKwR Ges iB I gMj i Rb` 4 ugij Mh/tKwR wntmte Wtm=ft, Rvgyix I tdeiyix grfmi cUg mBvtn GKevi Kti BbtRkkb t`qv nq| Zte wnj fvi KvtcP cUwZ ev cwi c`Zv NUvtvi Rb` tKvb BbtRkkb t`qvi cUqvRb tbB| nitgvb cUqvMKZ. gvQ webv BbtRkkb cwi Z gvtQi tPtq AtbK AvtMB cwi c`Zv jvf Kti| Dtj- LthvM` msL`K eY gvQ tdeyix grfmi tkfli mBvn ntZ gvP`grfmi gvSigwS chS- mgtqi gta` cwi c`Zv jvf Kti| ZvB cUg e`vtpi cRbb G mgtq Kivtvi thZ cvti|



Ablyj b (Activity) t aiy, Avcbvi GKwU n`vPmi AvtQ thLvtb 4 tKwR IRtbi 5wU KvZjv I 3 tKwR IRtbi 4wU iB Gi Y eY gvQ AvtQ| Gt`i tMbvWi cwi c`Zvi Rb` tKvb& aitbi nitgvb Kx cwi gvY e`envi Kitb Zv hvj` mnKvti wj Lly|



mvi gg` th me cyj I Y gvQ cRbb KitZ mYlg Zv`i tK cRbbYlg ev eY gvQ ejv nq| cRbbYlg gvQ cRbb Kvtj i AvtMB gRZ I jvj b cvj b KitZ nq| eY gvQ e`ve`vcvri tYtI cKz wePb I cU`ZKiY, gvtQi cRwZ wePb, gRZKiY I iYvteY, mvi cÓqM, m=úíK Lv` cÓqM BZ`w` Kvhfejx m=úv` b KitZ nq|



cuVvEi gj'iqb 9.2

mMK DEti i cuK MK Py (✓) w b|

1/ cRbb7lg gvQ gRz cKzi i Mfxi Zv KZ nI qv DWPZ?

K) 0.5-0.75 ug.

L) 1.5-2 ug.

M) 3.5-4 ug.

N) 5- 10 ug.

2/ gRz cKzi tn±i cZ Kx cwi gvY eW gvQ gRz Kiv DWPZ?

K) 3000-4000 tKwR

L) 4000-5000 tKwR

M) 1500-2000 tKwR

N) 500-1000 tKwR

3/ cRbb7lg gvQoi cKzi gvQ Qvovi cte°cZ tn±ti Kx cwi gvY tMvei mvi w tZ nte?

K) 20000 tKwR

L) 15000 tKwR

M) 10000 tKwR

N) 5000 tKwR

4/ Kwi g cRbtbi ev wWg Qvovi KZw b AvtM gRz cKzi m±ui-K Lveri t`qv eU Kiv nq?

K) 2 w`b

L) 7 w`b

M) 15 w`b

N) 21 w`b

5/ KvZjv gvQoi cwi c°Zv Zi wšZ Kivi Rb` cRbb mgtqi wZb gvm AvtM cZ gvfm KZUKzic.wR. BbtRKkb w tZ nq?

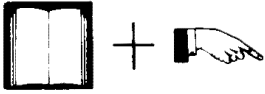
K) 1-2 ug. Mg/ tKwR

L) 5-6 ug. Mg/ tKwR

M) 7-8 ug. Mg/ tKwR

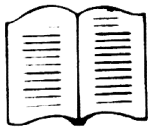
N) 3-4 ug. Mg/ tKwR

cW 9.3 **ucUBUvix MŠ' mSMā, msi ԴY Ges niṭgvb BbṭRKkb ˆZvi I cōqum CxvZ**



G cW tkṭI Avicb –

- ucUBUvix MŠ' Kx Ges tKv_vq _vṭK Zv Dṭj և KiṭZ cviṭeb/
- Kxfiṭe ucUBUvix MŠ' (uc.ՊR.) mSMā Kiv nq Zv eYṅv KiṭZ cviṭeb/
- Kxfiṭe uc.ՊR. msi ԴY Kiv nq Zv eYṅv KiṭZ cviṭeb/
- Kxfiṭe uc.ՊR. t_ṭK niṭgvb ˆeY ˆZvi Kiv nq Zv eYṅv KiṭZ cviṭeb/
- Kxfiṭe uc.ՊR. ˆeY gvṭQ BbṭRKkb t`qv nq Zv RivṭZ cviṭeb/



ucUBUvix MŠ' (Pituitary gland)

ucUBUvix MŠ' ev uc.ՊR. (P.G.) cōYṭ` i GKuL LṅB , iṅcYṑMŠ' | GuU GKaitbi AšṭԴiv MŠ' | GuU nṭZ ub:mZ niṭgvb Ab'vb` G RivZxq MŠ' Kvhṅg ubqšY Kṭi | GRb` ucUBUvix MŠ'ṭK cṭf, MŠ' ej v nq | ucUBUvix MŠ' nṭZ hZ niṭgvb ub:mZ nq Zvi ḡṭa` tMō_ niṭgvb (growth hormone) Ges tMvbtWvUicb (gonadotropin) LṅB , iṅcYṑ tMō_ niṭgvb t`ṭni mmeR epx ubqšY Kṭi Ges tMvbtWvUicb niṭgvb tMvbtW ev thšb AšṭMi epx I Kvhṅj ṭK cṭfveZ Kṭi _vṭK | Avi tm Rb` uc.ՊR. Kūg cṂbṭbi Rb` cṭfveK ev BbṂWDums ḡṭR:U inṭmte e`eüZ nq | uc.ՊR. gvṭ`i vbtP Aev`Z |

ucUBUvix MŠ' cōYṭ` i GKuL LṅB , iṅcYṑ MŠ' | GuU GKaitbi AšṭԴiv MŠ' | GuU nṭZ ub:mZ niṭgvb Ab'vb` G RivZxq MŠ' Kvhṅg ubqšY Kṭi | GRb` ucUBUvix MŠ'ṭK cṭf, MŠ' ej v nq |

ucUBUvix MŠ' mSMā

ucUBUvix MŠ' mSMāni cṭeṑth gvQ t_ṭK mSMā Kiv nṭe tm gvQ mṑṭU ևKQyևKQyZ` tRṭb vbtZ nṭe |

ˆvZv gvṭQi ˆenkó`

th gvQ t_ṭK ucUBUvix MŠ' mSMā Kiv nq ZvṭK ˆvZv gvQ etj | eY gvQṭK cṂbṭb cōYw`Z Kivi ԴlgZv AṭbKvṭk ˆvZv gvQ vbeṑṭbi I ci vbfṑkxj | Avi tm KviṭYB ˆvZv gvQ mṑṭK ևbṑj ևLZ Z` RivṭZ nṭe |

(K) ˆvZv gvṭQi cwi c° Zvi aic (Stage of maturity of the donor fish)

Kūg cṂbṭbi Rb` mṑṭYṑthšb cwi c° gvQ t_ṭK uc.ՊR. mSMā KiṭZ nṭe KviY cṂbb FZṭZ GKuL cṂbbԴg gvṭQi uc.ՊR. me PvbṭZ tenk KivRix ev KgԴg | cṂbṭbi cṭi uc.ՊR. օi KivԴlgZv Kṭg hvq | th gvQ ևWg tQto ևṭṭq ev th gvṭQi thšbZv cwi c° bq tm gvṭQi uc.ՊR. i ԴlgZv LṅB Kg | t`kx KvcṑRivZxq gvQ thgb iṅ, KivZjv, ḡṭMj BZ`w` i uc.ՊR. ḡṂRjvB gvṭmi ḡṭa` mSMā Kiṭj AwaK kiv³kijx uc.ՊR. cvl qv hvq | Kgb Kvcṑ Kvcṑ gvQ GKuL Dṭj ևṭhM` ˆvZv gvQ KviY Giv cōq miv eQiB thšb cwi c° _vṭK | G gvṭQi uc.ՊR. i AvKvi I Zṅbvḡj-Kfiṭe eo |

Kgb Kvcṑ Kvcṑ gvQ GKuL Dṭj ևṭhM` ˆvZv gvQ KviY Giv cōq miv eQiB thšb cwi c° _vṭK | G gvṭQi uc.ՊR. i AvKvi I Zṅbvḡj-Kfiṭe eo |

(L) ˆvZv gvṭQi Ae`v (Condition of donor fish)

RmeZ ev m` ḡṭi ṭdjv nṭṭq GiKg gvQ t_ṭK uc.ՊR. mSMā Kiv AwaK fij | ZvRv/ RmeZ gvQ AchṑB nṭj th mKj gvQ ZvRv Ae`vq tKvi t`vṭiṭR ivLv nṭṭqj tm i Kg gvQ t_ṭK I uc.ՊR. mSMā Kiv hvṭe | th ḡZ gvQṭK 1-30tm. Zvcgvṭvq 24NvUv ivLv nṭṭqj tm ifc gvQ t_ṭK KvhԴlg uc.ՊR. mSMā Kiv hvq |

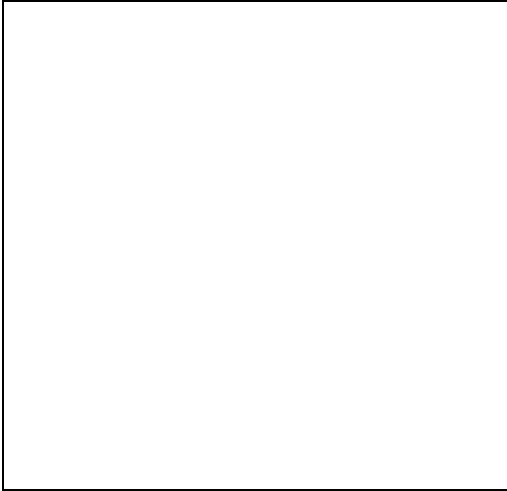
(M) Խ.Ռ.Օի Drm (Source of pituitary gland)

cjyA_ev չ th tKvb gvQ t_ձKB Խ.Ռ. mslMh Kiv hvq| th gvQ Խ.Ռ. e`envi Kiv nte H GKB cRvzi gvQ t_ձK mslMpxZ Խ.Ռ. tewk KvhRix| GKB cRvzi bv ntj l mgMvixq th tKvb gvQ t_ձK Խ.Ռ. mslMh Kiv thZ cvti GgbwK gvQ Qvovl Ab`vb` kxZj i³ wekó c0Yxi Խ.Ռ. l gvQ cRbibi Rb` e`envi Kiv thZ cvti | K`Uwdk ev gv_i RvZiq gvQi Խ.Ռ. KvcRvZiq gvQi cRbibi e`envi Kiv thZ cvti Avevi Zvi necixZfiteI m`e| `i m`uRixq gvQ t_ձK mslMpxZ Խ.Ռ. i BbtRkkibi tWvR ev gvIv GKUzemoq w` tZ nq|

cjyA_ev չ th tKvb gvQ t_ձKB Խ.Ռ. mslMh Kiv hvq| th gvQ Խ.Ռ. e`envi Kiv nte H GKB cRvzi gvQ t_ձK mslMpxZ Խ.Ռ. tewk KvhRix| GKB cRvzi bv ntj l mgMvixq th tKvb gvQ t_ձK Խ.Ռ. mslMh Kiv thZ cvti GgbwK gvQ Qvovl Ab`vb` kxZj i³ wekó c0Yxi Խ.Ռ. l gvQ cRbibi Rb` e`envi Kiv thZ cvti | K`Uwdk ev gv_i RvZiq gvQi Խ.Ռ. KvcRvZiq gvQi cRbibi e`envi Kiv thZ cvti Avevi Zvi necixZfiteI m`e| `i m`uRixq gvQ t_ձK mslMpxZ Խ.Ռ. i BbtRkkibi tWvR ev gvIv GKUzemoq w` tZ nq|

gv_vi Lyj AcmiY Kti Խ.Ռ.mslMh

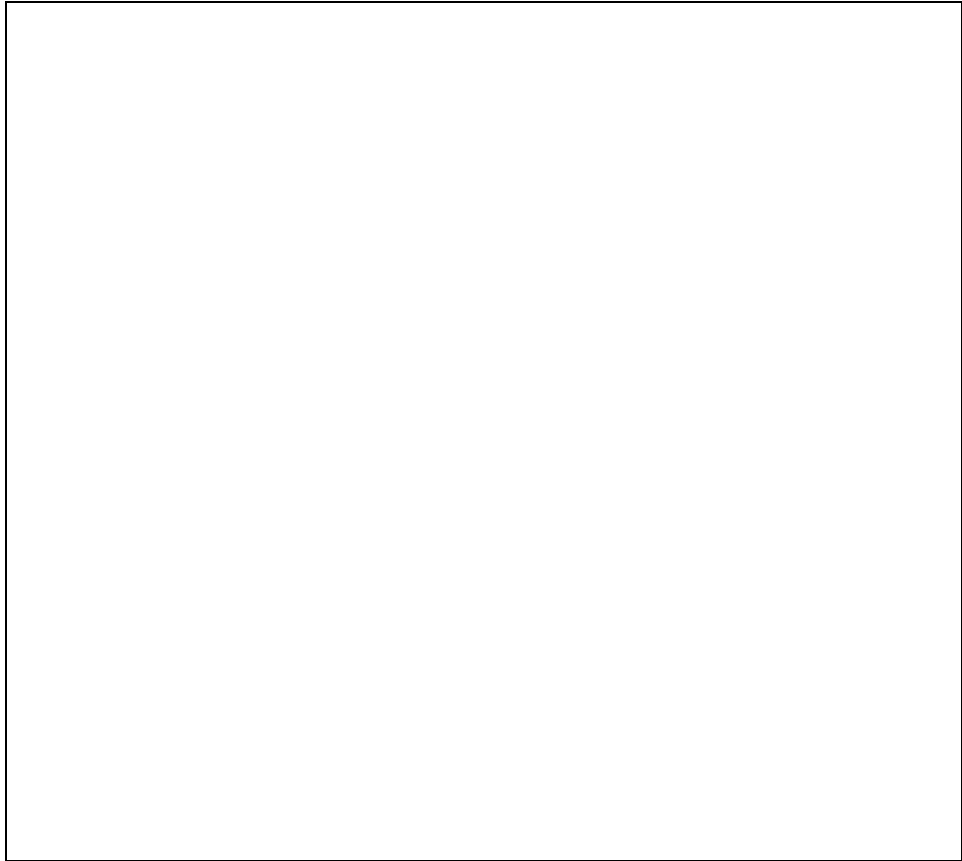
gv_vi Lyj i ԽQyAsk Dci t_ձK niv KivZ w` tq tKtU tdj tZ nte (ԽՒ-68) | tQvU gvQi t`t` nvo KivUvi (bone cutter) w` tql Lyj Ztj tdjv hvq| Lyj Ztj tdj tZB gw`i Dci ami PveRvZiq c`v` Lv hvte| Ztjv w` tq ami c`v` cwi`vi Ki tZ nte| BnvZ gw`i Dci c`p cwi`vi fite t`Lv hvte| gw`i mvgtbi w` tK Aew`Z Aj d`vKUiX (bwmKv) brf` I AcuUK (P`jz brf`Pglv w` tq Խto tdj tZ nq| GLb gw`U`K DvMq ԽQtb i w` tK tdj w` tZ nte| Խ.Ռ. gw`i ԽtPi AcuUK KivRgvi (ԽU P`jzqyGtK Acti i necixZ w` tK P`j hvq dtj Dniv GK RvqMvq Խgij Z nq hvK AcuUK KivRgv etj) ԽQtb Aew`Z|



ԽՒ 68 t gvQi gv_v| gvQi gv_vi Lyj i th Ask tKtU mwi tq tdj tZ nte Zv m`v ti Lvi gva`tg t` Lv`bv ntqQ|

KvcRvZiq gvQi t`t` Խ.Ռ. GKU cvZj v c`P 0viv gw`i t_ձK c`K _vK|

tKvb tKvb gvQi t`t` Խ.Ռ. gw`i mvt_ tj tM _vK dtj gw`i DVtbi mgq teBtbi mvt_ Խ.Ռ. l Dtv Avtm| Zte tewki fvm t`t`B gw`i DVtj Խ.Ռ. Dniv Ae`v`B t_ձK hvq| KvcRvZiq gvQi t`t` Խ.Ռ. GKU cvZj v c`P 0viv gw`i t_ձK c`K _vK| mveavZv Ae j`b Ki tZ nq hvZ gw`i DVtbi mgq c`m Խ.Ռ. teBtbi mvt_ Խg`k bv hvq| Խglv w` tq c`U mveavb ԽQtb i w` tK mwi tq tdj tZ nte| Gi dtj Խ.Ռ. Dgy` nte (ԽՒ-69) | Խ.Ռ. ԽtK m` Խglv ev m`Pi mivth` Ly mveavb MZ`t_ձK Ztj tKvb t`Uw`k 100% B_vbtj ivL tZ nte| Խ.Ռ. ԽtK A`jZ ti tL Dniv Mvtq tj tM _vKv gvsm`ckx ev i³ cwi`vi Ki tZ nte| ԳZc0B Խ.Ռ.Օի Kvh`gZv nwm cvq|



uP 69 t gvtQi gv_vq gw~i i ubtP MtZ^Aew^Z ucUBUvi x MÖS' t` Lvrbv ntqtQ/

(3) uc.uR. msi qY

uc.uR. A_er uc.uR.Öi ubhfm KvhRvvi Zv mn weifbæmg tqi Rb" msi qY Kiv hvq/ uc.uR.

msi qYi Rb" uZbuU câvb c^uZ ubt^æwY^Z ntj v t

(K) Gebmwj DU A`vj tKvtj msi qY

(L) GmvtUvfb msi qY

(M) Zvor uchwRs Gi gva`tg msi qY

(K) Gebmwj DU (100%) A`vj tKvtj uc.uR.msi qY

uc.uR. msMöni mvf_ mvf_ Zv Gebmwj DU A`vj tKvtj ivLtz nq/ cÖZuU MÖS' kbr^3Kvi x

uPy mn Avj v`v Avj w`v fvqvj (vial) G ivLtz cvi tj fij nq/ Zte tenk fvqvj br_vKtj

GKmvf_I ivLv hvq/ 24 NöUv ci MÖS' Gebmwj DU A`vj tKvtj a`q Avevi bZb A`vj tKvtj

tKvb VvÜv Ges Övqhÿ RvqMvq Kq Zvcgvvq A_er ti udrviti Ut i e`envi Kivi ce^chS

ivLtz nte/ fvqvj i gly Aek`B ubw`r`fvte eÜ Kti w`tz nte/ fvqvj i A`vj tKvtj mgq

mgq cwi eZB Kti GKBFvte ti tL w`tz nte/ fvqvj Rj Kbr cÖek ti va Ktí Dnit`i GKw

tWmvtKUti (desiccator) ivLv hvq thLvfb cwbMönx c`v`^thgb K`vj imqvq tKvi vBW AvtQ/

tWmvtKUi tKvb VvÜv Ktq A_er ti udrviti Ut i ivLvB DEg/

uc.uR. msMöni mvf_ mvf_
Zv Gebmwj DU
A`vj tKvtj ivLtz nq/

Getmij DU A`ij tKvj uc. r. tK cmb`b` I Pwe`b` Kti | 100% wei x A`ij tKvj e`envi
Ki tZ nte Kiv ni tgvb cmb tZ `eYxq| `xN`mg tqi Rb` uc. r. msi qY Ki tZ tM tj
A`ij tKvj gvtS gta` cwi eZ` Kti bZb A`ij tKvj w` tZ nte|

(L) Gim tUrb uc. r. msi qY

Gim tUrb uc. r. msi qY Kiv t tZ cti Zte G tZ ti wdRv ti Uti i c`qvRb nh| ZvB thLv b
ti wdRv ti Ui tbB tmLv b G c`xZ e`envi Kiv hvq br|

gvtQi gv_v t` tK uc. r. msl`ni mvt_ mvt_ B DnvtK wei x Gim tUrb ev eidkxZj Gim tUrb
ivLv nq| fvqj `tj vtK Gi ci tKvb ti wdRv ti Uti 36-48 NvUv Rb` ivLv nq| m`uY`cwb
i`b` I d`vU i`b` Kivi Rb` G mg tqi gta` 8-12 NvUv ci ci Gim tUrb cwi eZ` Ki tZ nte|
Gici uc. r. tK fvqj t` tK tei Kti wd`vi KvM tR i`Kv tbr nq Ges I Rb Kti Ab` GK u
toivBj fvq tj Gim tUrb w` t q `vbr`li Kiv nq| fvqj u tK cti ti wdRv ti Uti e`envi ce`
ch`msi qY Kiv hvq|

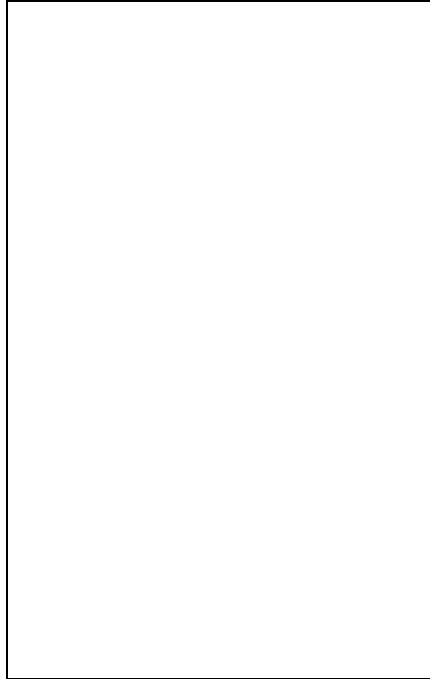
(M) ZvR vcl`Rs Gi gva`tg uc. r. msi qY

m` msMpxZ uc. r. mi vmi w/cwd`R msi qY Kiv t tZ cti |

4| ni tgvb Bb tRk kb `Zwi (Preparation of solution for injection)

gvtQ Bb tRk kb t` qvi wK ce`gy tZ` uc. r. n tZ ni tgvb `eY `Zwi Ki tZ nq| c` t g eY
gvtQi I Rb AbzvtZ wK cwi gvY uc. r. `iKvi nte Zv wmi e Ki tZ nte| c`qvRbxq
cwi gvY/msL`K uc. r. fvqj t` tK tei Kti GK u wd`vi KvM tRi Dci 1-2 wgvU ivLv nq
hv tZ A`ij tKvj i`K t q hvq| mvgv` cwiZZ cwb ev 0.3 % mvari Y j eY `eYmn uc. r. tK
GK u wUmy tnvgtRbvBRv ti tbqv nq| Zte Gim tUrb msi qY uc. r. mi vmi fvqj t` tK
wUmy tnvgtRbvBRv ti `vbr`li Kiv nq (wP t -70)|

gvtQ Bb tRk kb t` qvi
wK ce`gy tZ` uc. r. n tZ
ni tgvb `eY `Zwi Ki tZ
nq|

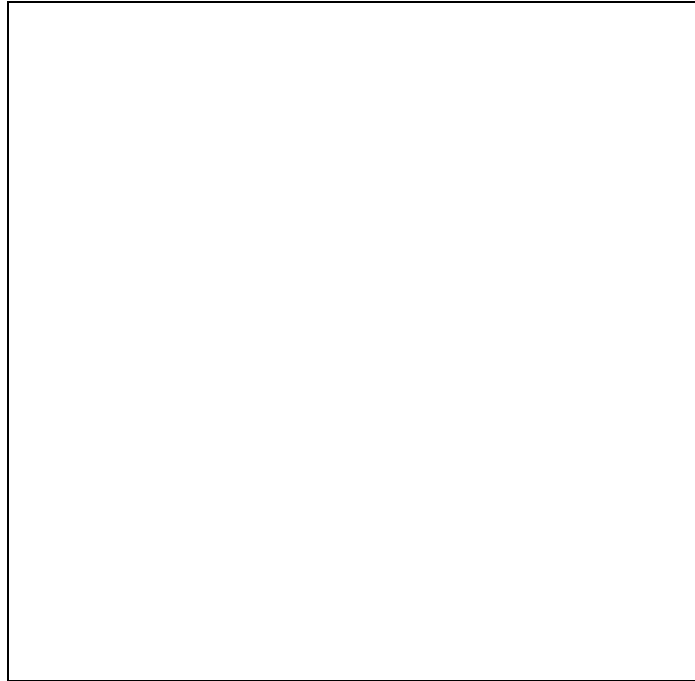


70 t UmytnvgnRbvBRvi

cwi®vi b`x ev cKzi i cwb hvi uc. GBP ubDUtj (7) Zv gva`g intmte e`envi Kiv thtZ cvti | UmytnvgnRbvBRvi uc. uR. tK GKU `tUi mnvth` tciY Kiv nq hvntZ uc. uR. hZUKzm=e e`euZ gva`tg ugtk hvq| tclbKZ. uc. uR. tZ c@qvRbxq NbZj cvl qvi Rb` `iKvi ntj Avil cwb/`eY thvM Ki tZ ntZ cvti | Kx cwi gY gvQtK BbtRkKb t`qv nte Zvi DciB ubfP Ki te KZUKz`teK e`envi Ki tZ nte| gtb ivL tZ nte `eY thb LpB Nb ev LpB cvZj v br nq|

mvaviYZ 2-3 ug. Mlg uc. uR. 0.1 ugij `eY `exfZ Kiv nq| A_@ c@Z ugij `eY 20-30 ug: Mlg uc. uR. i `eY `Zvi Kiv nq| G grv c@qvRtb Kgvtrv ev evovtrv thtZ cvti | gvQi AvKvii Ici ubfP Kti mteP 1 ugij Ges mebae 0.1 ugij `eY BbtRkKb t`qv thtZ cvti | D`vniY`fc GKU cRbbKvix gvQtK 45 ugij Mlg uc. uR. BbtRkKb w`tZ nte| hv` c@Z 0.1 ugij ij Uvti 3 ugij Mlg uc. uR. `exfZ Kiv nq Zvntj 45 ugij uc. uR. i Rb` 1.5 ugij `teKi c@qvRb nte | uKs` thtnZzc`ejv ntqtQ th GKU gvQi Rb` mteP 1 ug. ij. Mlg `eY e`envi Kiv DvPZ tm`t`t` c@Z 0.1 ugij -G 5 ugij Mlg uc. uR. i `eY `Zvi Ki tZ nte| dj `fc tgvU ni tgvb `eYi cwi gY nte 0.9 ugij |

uc. uR. oi mmtcbmb tnvtgnRbvBRvi t`tK GKU tmvUtdDR tgvktbi uJDe `vbsi Kiv nq| Xjvi cte®tnvtgnRbvBRvi fij fvte tStK ubtZ nte hv tZ Kti t`Zvtrv M@SKYv fij fvte `eY ugtk thtZ cvti | Gici `eYmn uJDev GKU n`Pvj Z A`ev we`y Pvj Z tmvUtdDR tgvktb `vcb Kiv nq (71-71) | tgvktb Pjv br Kij A`eYxq Kbv uJDei Zjvq Rgv nte Ges cwi®vi `eY Dvni Dc`i Ae`vb Ki te| BbtRkKb t`qvi Rb` GKU cwi®vi mnvth` uJDei Dvni fvMi `^Q `eY tmvUtdDR uJDe ntZ Zj tbqv nq|



IP1 71 t n` Pwj Z tmwUtdDR tgnkb

uc. uR. BbtRKKtbi tWwR ev gvIv

ni tgvubi gvIv ubafl bx th
me AbYUK me`gvb Zvi
gta` gvtQi eqm, AvKvi
Ges thsb cwi c°Zvi
Ae`v metPtq teuk
iZcYp

uc. uR. `etYi mWk tWwR ubafl Y Kiv KuIg cRbtbi Rb` LgB iZcYp` f gvIv tKvb
tKvb mgq Avt`S KvhRix bv nZ cvti Avevi Awak gvIv AcU3 Wlg QvotZ eva` Kti hvi
dtj Wlg cwi Ubttbi AbgvZ Dvj - LthvM` nvti Ktg hvq| nitgvubi gvIv ubafl bx th me
AbYUK me`gvb Zvi gta` gvtQi eqm, AvKvi Ges thsb cwi c°Zvi Ae`v metPtq teuk
iZcYp` GuU mWk fite ubafl Y Kiv LgB KuWb KviY AtbK mgq f`Lv hvq th GKB
cRwZi, GKB eqtmi Ges GKB AvKvti i gvtQi gta`I thsb cwi c°Zvi Zvi Zg` cwi j WJZ
nq| Avevi th mg`uc. uR. e`envi Kiv nte tm, tjvi KvhRix Zvi gta`I cv`R` _vKtZ cvti
ev _vKvB` fweK|

AtbK mgq thsb
cwi c°Zvi gta`
Zvi Zg` tnZzGKB
AvKvti i gvQK GKB
cwi gvY BbtRKKb
w` tj I dj vdtj i gta`
cv`R` f` Lv hvq|

th cRbbKvix gvQK BbtRKKb f`qv nte Zvi IRtbi Dci wfmE KtiB BbtRKKtbi/
uc. uR. oi cwi gvY wntme Kiv nq| AtbK mgq thsb cwi c°Zvi gta` Zvi Zg` tnZzGKB
AvKvti i gvQK GKB cwi gvY BbtRKKb w` tj I dj vdtj i gta` cv`R` f` Lv hvq|

Wlg hw` cwi c° bv nq A`ev Wlg hw` Ww^uj tZ wgtk hvl qvi Ae`vq tcstQ Zvntj Awak
gvIvq BbtRKKb w` tj I fij dj cvl qv hvq bv ev gvQ Avt`S Wlg Qvto bv| AwfAZvi
Avtj vtK eYvgvQ ubePb Kti GKwU wbr` 8 gvIvq BbtRKKb w` tj 60-70% t`jtI gvQ cRbb
Kti _vtK| f` Lv tMtQ th hw` cU`wgK chq GKwU` f` gvIvi BbtRKKb Ges 4-6 NvUv ci
Atc`jvKZ. Awak gvIvi BbtRKKb w` tj fij dj cvl qv hvq| i agvI` x gvtQ 2wU BbtRKKb
f`qv nq| Zte cjtj gvtQ Zj tctU Pvc w` tj hw` fij wge` (i`mYy) bv tei nq Zvntj cjtj i
t`jtI 2wU BbtRKKb w` tZ nte| mvi wY-1 G KtqKwU iZcYp` gvtQi uc. uR. BbtRKKtbi
gvIv cU`E ntj v|

mvavi YZ t KtqKul , iZcygvtQi uc.ՊR. BbtRkktbi gvTvl

gvTQi bvg	uc.ՊR. i cwi gvY (cՃZ tKwR gvTQ)		tgW
	cՂg BbtRkktb	ՊZԻq BbtRkktb	
KvZjv	2-4 ւցւյj Mձg	7-8 ւցւյj Mձg	9-12 ւցւյj Mձg
iԹ I gtMj	2-3 ւցւյj Mձg	5-6 ւցւյj Mձg	7-9 ւցւյj Mձg
ււյj fvi Kvc©	2-4 ւցւյj Mձg	8-10 ւցւյj Mձg	10-14 ւցւյj Mձg
Mձm Kvc©	2-4 ւցւյj Mձg	7-9 ւցւյj Mձg	9-13 ւցւյj Mձg

hԻ՝ uc.ՊR. IRb Kivi Rb՝ tKvb յԵԼԻ e՛ւյj Y՛ bv յԵԿ Zvntj msL՛v ւււմիել uc.ՊR. BbtRkktb t՛ qv thZ cvti | Gt՛Պt՛T GKB cՔււՅi GKB AvKvti i cwi c° gvQ t՛ԷԿ msMpxZ 1-3ւU uc.ՊR. GKtRvov eՅ gvQտK BbtRkktb t՛ qv nq |



Ablyj b (Activity) t aily, Avcbvi GKul n՛vPwi tZ 4 tKwR IRtbi 10ւU KvZjv, 4 tKwR IRtbi 5ւU iԹ I 3 tKwR IRtbi 5ւU gtMj gvQ AvtQ | 1g I 2q BbtRkktb cՂqvTmi t՛Պt՛T KvZjv, iԹ I gtMj gvTQi Rb՝ Kx cwi gvY uc.ՊR. i cՂqvRb hԻ՝ mnKvti vj Lly |

ni tgvb BbtRkktb cՂqvM c×ւZ (Method of hormone injection)

mvavi YZ Aճtgvsmtckxq (intramuscular) BbtRkktb ծviv ni tgvb eՅ gvTQ cՂqvM Kiv nq | GQvov AճtMnei xq (intraperitoneal) BbtRkktbi gva՛tgI ni tgvb cՂqvM Kiv thZ cvti | BvUտcwi tUmbqvj BbtRkktb tktbx cvLbv ev eՊ cvLbvi tMvovq t՛ qv nq | Zte G c×ւZ tZ gvTQi Af՛ճի xY AճtMi ՊւՅi m՝ժebv յԵԿ | յեճկl Kti hLb ֆx gvTQi ււՄ՝ժkq AvZւի՝ cwi c° ււՅg avitbi Rb՝ ewaZ nq | GQvov ci ci cՂqvMKZ. BvUտcwi tUmbqvj BbtRkktb յեճկl Kti hLb uc.ՊR. ՛եY QւKv nq bv, ՊւՅKի c՛ի ve tdj tZ cvti |

mvavi YZ
Aճtgvsmtckxq
(Intramuscular)
BbtRkktb ծviv ni tgvb
eՅ gvTQ cՂqvM Kiv
nq |

Ab՛ւ՛ ԷԿ BbUտgvmkzvi BbtRkktb cՂqvM c×ւZ mnRZi I տեճ KvhՔix | G BbtRkktb mvavi YZ tj tRi AĀtj A_ ev cā. cvLbvi ւտ՛P Ges cvkՔի Lvi Dc՛ii Aճt cՂqvM Kiv nq | Նյւ BbtRkktbi t՛Պt՛T DfqcvtkՔիւU Kti t՛ qv nq | BbUտgvmkzvi BbtRkktbi Rb՝ GKul AvBճki ւտ՛P cՂg t՛ ճni mgvճի vj Ges c՛ti 45° tKvtY mP cՂek Kivtvb nq (ւՄT-72) | 2 ււ.ււ. gvTci ni BճcvWngՔ ււււi Ā ni tgvb BbtRkktb t՛ qvi Rb՝ mnRZi/Dc՛thvMx | B.D.H. (eՅJk WMM ni Dm) mP bs 22 ծviv 1-3 tKwR IRtbi gvQտK, tQiv AvKvti i gvQտK 19 bs mP ւ՛ tգ mnտRB BbtRkktb t՛ qv thZ cvti |



cuVvEi gj'iqb 9.3

mW/K DEti i cuK W/K WPy (✓)w b/

1/ ucUBUvi x Mš' ej tZ Kx eSvq?

- K) GK ai tbi ein: qiv Mš'
- L) gw-t®i GKw Ask
- M) GKw AwZ , iZcYAsť qiv (bij xrx) Mš'
- N) GbRvBg Drcv`bKvix Mš'

2/ Kx ai tbi gvQ t_ tK uc. wR. msMh Kiv DvPZ?

- K) gZ Ges cPb m=ubantq tQ Ggb
- L) thšb cwi c° gvQ
- M) GKB cRwZi th tKvb gvQ
- N) mg tMv t xq th tKvb gvQ

3/ uc. wR. msi q tY e" eüZ me tPtq DEg i vmvqubK `e" tKvbuU?

- K) Gum tUvb
- L) Getmvij DU B_vbj
- M) di gvij b
- N) mvj wcdwii K GumW

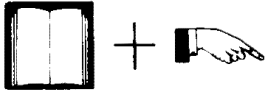
4. ucUBUvi x Mš' tKv_vq Aew`Z?

- K) gw-t®i w tP
- L) gw-t®i Dc ti
- M) gw-t®i m=švfi tM
- N) gw-t®i wfZ ti

5/ cšZ wgvij wj Uvi `e tY Kx cwi gvY uc. wR. `exfZ Kiv DvPZ?

- K) 5-10 wgvij Mšg
- L) 10-12 wgvij Mšg
- M) 15-18 wgvij Mšg
- N) 20-30 wgvij Mšg

cW 9.4 Wlg dɛɛtɔvɪ cɔɔqv, dɛɛtɔvɪ cɔɛvɛK mɔn Ges dɛɛtɔvɪ ɛɛfɔɛ cɔɛɛi eˈenvi



G cW tɛɛɛ Avɛɛɔ –

- Wlg dɛɛtɔvɪ Kj vɛKɔskj eˈvLˈv KiɛɛZ cviɛɛb|
- Wlg dɛɛtɔvɪ cɔɛvɛK mɔn mˈuɛɛtKˈAvɛɛj vPbv KiɛɛZ cviɛɛb|
- Wlg dɛɛtɔvɪ ɛɛfɔɛɛKɔskj /cɔɛɛi eˈenvi Kɛɛfɛɛ KiɛɛZ nq Zv eYɔv KiɛɛZ cviɛɛb|

Wlg dɛɛtɔvɪ cɔɔqv



cɔɛɛb cɔKvɔ t_ɛɛK Wlg mɔMɔ I cwi ɛɛɛb cɔKvɔ ˈvɛɛɛɛ

Wtgi wɛɛZi ɔɛ hLb tɔvPovɛɛv ɛɛPj b (twisting movement) i iYKɛi ZLbB WgtɛK dɛɛtɔvɪ cɔKvɔ ˈvɛɛɛɛi i Rbˈ mɔMɔ Kiv DɛɛZ KviY G mgq Wlg tɛɛk k³ nq hvi dtj ZɛɛvɔjKɛɛv tɛɛk aKj mˈnˈ KiɛɛZ cɔɛi | cɔɛɛb nvcv t_ɛɛK Wlg mɔMɔ Kivi Rbˈ cɔɛɛg nvcvi Zjɛɛɛi evɛɛb Lɛɛj Lɛɛj t_ɛɛK Avjvˈv Kɛi Avɛɛˉ Avɛɛˉ Dɛɛi DVɛɛZ nq hvɛɛZ Wlg ɛɛj nvcvi tLj vɔɛɛɛ Pɛɛj hvq | cɔɛɛbKvix gvQɛɛK Wlg mɔMɔni cɛi nvcv t_ɛɛK mivɛɛv nq | ɛɛRbˈ Ah_v bɛɛvPɛɛv Kɛi WgtɛK Qvɔtq bv wˈɛɛ tɛɛvɛɛv gvZɛɛZv gvQɛɛK Abˈ ˈvɛɛ mivɛɛv Rbˈ cɔɛɛv Z Kiv nq | GLb WgtɛK GKɛɛ Kvc, tɛɛqjv ev ɛɛKvɛi i mɛɛvɛɛˈ nvcv t_ɛɛK Zɛɛj tɔv nq Ges GKɛɛ evj wɛɛZɛɛ wKQɛɛv wˈɛɛ tɛɛLɛɛv ivLv nq |

cɔɛɛbKvix gvQɛɛK Wlg mɔMɔni cɛi nvcv t_ɛɛK mivɛɛv nq |

Wtgi ɛɛYv Y I cwi gvɛɛ ɛɛvɛɛY

Wlg ɛɛj vɛɛK AvqZvKivi gkwi i Rij A_ ev big ɛɛɛ³ dɛɛk mˈuɛɛvɛKvɛɛtɔ tɔv nq | GgZvɛˉvq ˈɛɛb tj vɛɛK KivcɛɛɛɛɛK ˈɛɛvɛɛɛ K nvcv wˈɛɛ cɛɛvɛɛZ ɛɛi ivLɛɛZ nɛɛ | Kivcɛɛɛ Gi ci Avɛɛˉ Avɛɛˉ DVɛɛKɛɛZ nɛɛ hvɛɛZ Kɛi mgˉɛɛv i wKɛɛq hvq | AZ:ci Wlg ɛɛj vɛɛK GKɛɛ ɛɛKvi, Kvc ev gɛɛM ɛɛtq AvqZb tɛɛc ɛɛtq dɛɛtɔvɪ cɔKvɔ ɛɛ nvcv ˈvɛɛɛɛ KiɛɛZ nɛɛ |

bgɛɛvq mɔMɔvɛɛ Wtgi AvqZb I mɔLˈvi mɛɛvɛɛˈ Avɛɛ mɛɛɛRB Wtgi tɔvU AvqZb I mɔLˈv ɛɛmve Kiv hvq | tɛɛk ɛɛfɛɛ ɛɛmɛɛvɛi Rbˈ wɛɛɛvU bgɛɛv mɔMɔ Kiv nq | wɛɛɛvU bgɛɛvɛi Wtgi MɔmɔLˈv cɛɛZ ɛɛKvɛi i Wtgi Mɔ mɔLˈv ɛɛtˈɛɛ Kɛi | ɛɛtˈPɛi mˈɛɛ Avɛɛvɛi Lɛɛ mɛɛɛRB tɔvU Wtgi mɔLˈv ɛɛmve Kiv hvq |

tɔvU Wtgi mɔLˈv = cɛɛZvU ɛɛKvɛi Wtgi MɔmɔLˈv × tɔvU ɛɛKvɛi i mɔLˈv | Wtgi tɔvU mɔLˈv Rivvɛi mɛɛˉ mɛɛˉ Wlg ɛɛvɛɛɛ³ i I cwi ɛɛɛɛɛvɛi nvi ɛɛtɛi mˈɛɛ Avɛɛvɛi tɛi Kiv hvq |

$$\text{Wlg ɛɛvɛɛɛ}^3 \text{ kZKiv nvi} = \frac{\text{ɛɛvɛɛ}^3 \text{ Wtgi mɔL}^v}{\text{GKɛɛ bgɛɛvq Wtgi mɔL}^v}$$

Wlg dɛɛtɔvɪ cɔɛvɛK mɔn

Wlg dɛɛtɔvɪ cixɛɛɛɛɛ dj vɛɛj Aɛɛ ɛɛj v cɔɛvɛK ɔvɛv ɛɛvɛɛɛZ nq | tɛɛgɛ t

Wtgi cwi c°Zv

Wlg cɛɛvɛɛvɛi cwi c° bv nɛɛj cwi ɛɛɛɛɛvɛi nvi Kg nɛɛ | ni tɛɛvɛ BbɛɛRkɛb wˈɛɛ Kwɛɛg cɛɛRbɛɛv mgq ni tɛɛvɛvɛi gvɛɛv AvɛɛK nɛɛj AɛɛK Avɛɛ c° Wlg ɛɛvɛɛ nq - ɛɛ ɛɛj v dɛɛɛ bv |

Kul. I cju Dbqbb`z

cmbtZ`exfZ Aw tRb

Wlg dltvbi Rb`
cmbtZ chfB Aw tRb
_vKv`iKvi|

th cmbtZ Wlg dltvbi Rb` ivLv nq, tmLvtb chfB Aw tRb _vKv c@qvRb| thtnZzGKwU
cvfT ev nvcvq AfbK Wlg GKmvf_ ivLv nq tmRb` Aw tRtbi c@qvRb nq| Aw tRtbi
cwi givY Kg ntj AfbK Wlg givv hvq| Avevi gZ Wlg cBtbi dtj cmbtZ Aw tRtbi cwi givY
Avfiv Ktg hvq|

cubi Ab`ib` tfSZ I ivmqubK _Yv_Y

th cKzi nvcv`vcb Kiv nq, A_er th cub Wlg dltvbi veifbocvT e`envi Kiv nq, Dnvi
tfSZ I ivmqubK _Yv_Y thgb uc.GBP, `exfZ KwB c`v_© bviBUiBU, Gtgvbqv BZ`w
cwi ugZ Ae`vq _vKv DvPZ |

ZvcgvT

Wlg dltvbi tqtT ZvcgvT Ab`Zg cfveK| ZvcgvT Kg ntj Wtgi mBZvi Kvj `xWqZ nq,
Avi teik ntj mBZvi Kvj WQlyv Ktg hvq| Zte Gi GKwU mn`mxgv itqtQ|

cubi cEn

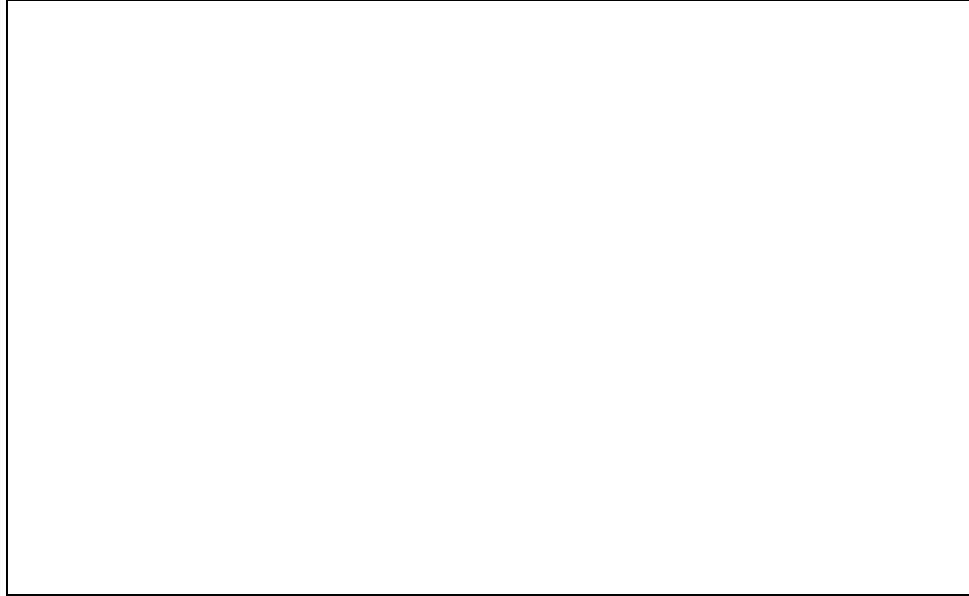
eFvKvi n`vPvvtZ fij fite Wlg dltvbi Rb` Aveivg cubi cEn eRvq ivLtz nq| Zv bv
ntj Wlg givv hvte|

Wlg dltvbi Rb` veifbocvT/hšcwzi e`envi

n`wPs nvcv

ti Yyfcvbi tdlUvevi nvcv ev n`wPsnvcv cRbb nvcvi gZ cvZjv gwK® Kvcv tmj vB Kti `Zwi
Kiv nq| cRbb nvcvi gZ Dcti Kvcto i XivKbv _vKv bv | WKS`GLvtb `yJ nvcv _vKv, GKUv
evBtii nvcv AvKvi 2x1x1 Nb ugUvi gwK® Kvcto tmj vB Kti `Zwi Kiv| Aci GKwU
wfZtii nvcv AvKvi 1.5 ug. x 75 tm.ug. x 75 tm.ug. (wP-73)| Kvcto i `Zwi wfZtii
nvcvUv evBtii nvcvi gta` wdZvi mivvth` teta ivLv nq | cRbb nvcvi gZ n`wPs nvcv
cKzi i cmbtZ Ges b`x I Lvji i Wkvfi Pvi w`K evk w`tg LvUvtr nq| wfZtii nvcvZ 2-
3 wj Uvi (c@q 40,000-75,000wU) Wlg fij fite Rti gta` Qwotq ivLv nq| nvcvZ
ivLevi 10/12 NÈv cti Wtgi tLvjm gŷ ntq ti Yyfcvbi tMvj dvk w`tg evBtii Kvcto
nvcvZ Rgv nq| Wtgi tLvjm, tjj wfZtii nvcvZ AvUtK _vKv | wfZtii nvcv Lvj mwi tg
ivLv nq| evBtii nvcvZ ti Yyfcvbi wZb w`b chSf ivLv nq| ti Yyfcvbi Kzgy _w (yolk
sac) t`K Lv` cvq| Ab` tKvb Lv` G mgq c@qvRb nq bv| Wgtcvb `k ugij wj Uvi
AvqZtbi Kvc ev Ab` tQvU cvfT tgc Absv Kiv nq KZ Wlg tcvb Drcv`b ntjv Ges
Wlg t`K ti Yyfcvbi chfB AvvtZ KZ mgq j Wtj v|

cRbb nvcvi gZ
n`wPsnvcv cKzi i cmbtZ
Ges b`x I Lvji i Wkvfi
Pvi w`K evk w`tg LvUvtr
nq|



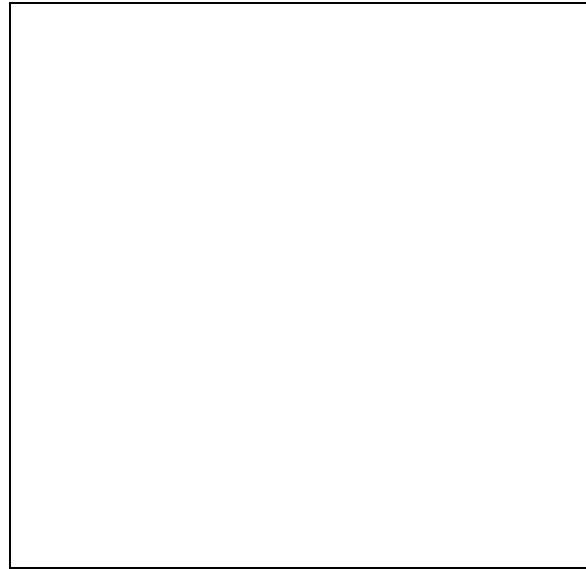
IPĪ 73 t n`mPs nıcv

MamRvi n`Pwi

MamRvi n`Pwi tZ wWg cĪŁtbi KivR cte`ewWZ Kivtoi n`mPs nıcv t`K A tK Dbz cwi t`k fij fivte m`ubakiv hvq |

G n`Pwi i cĀvb Ask wmwte vKte (1) cwb mieivni Rb` cKz ev fzMF` cwb DtĒvj tbi Rb` wDe Itqj cıvú mn (2) DĒZ ĩmcZ Rjvavi (water reservoir) (AvqZb 5500 wj Uvi) (3) cĪRbb cKz ev Rjvavi (breeding unit) (4) KvtPi ĩZwi wWg cĪŁtbi Rvi (incubation and hatching jars) (cĪZıU 6.35 wj Uvi) | KvtPi Rvi wj t`L tZ DtĒv tbi tevZ tji gZ, Dcti i Ask tguUv, wbtPi Ask μgk: miy (5) ti Yytcıv mĀq ivLevi Rjvavi (spawnery) (IPĪ-74) | 50,000 gıfQi wWg cĪZ KvtPi Rvı i vLv nq | KvtPi Rvı i gta` cwb btji mıvıth` wbtPi gly w` t`q cĒvıvZ Kiv nq | cĪZ wıgb tU 600-1000 wıwj . cwb GB Rvi t` tZ cĒvıvZ Kiv nq | wıj fvi Kvc` (silver carp) gıfQi wWg t` t` vi Rb` cwb cĒvıv wıgb tU 800-1000 wıg : wıj : cĪqvRb nq | wWg cĪŁtbi cti R tji cĒvıv mıgıv` ewx Kti m` RıvZ ti Yytcıv KvtPi Rvı i Dcti i tLıv gly w` t`q GKıU tLıv btji mıvıth` cwbı mtı Rjvavı cĒvıvZ Kiv nq | b` wWg l eR` Ask Rvı i gta` v`K | KvtPi Rvi n`Pwi tZ wWg t` t` t` ti Yytcıv tZ wKıv n tZ mgq cĪqvRb nq 15 NĒvi gZ | ti Yytcıv mĀq Kivi Rjvavı i Dci Svııı i mıvıth` cwb el` Kiv n t`q v`K | ti Yytcıv wZbıv b Rjvavı mıvıvZ ivLevi cti bıvııı cKzı vıvıııZ Kiv nq | GiKg 40ıU KvtPi Rvi hı n`Pwi tZ cte`ıj wLZ Abıv` miĀvg l e`e`ıv mn cĪq 20 j ı | ti Yytcıv GKıvı Drcıv b m`e |

KvtPi Rvi n`Pwi tZ wWg t` t` t` ti Yytcıv tZ wKıv n tZ mgq cĪqvRb nq 15 NĒvi gZ | ti Yytcıv wZbıv b Rjvavı mıvıvZ ivLevi cti bıvııı cKzı vıvıııZ Kiv nq |



¶T 75 t eĒvKvi n`vPwi

cġ `kj ¶ ¶Wg cġZ
NbwgUvi Rjvavti cġZbb
Kiv hvq/

¶Wg cġZbbi Rjvavi eĒvKvi, GKtKw`K (concentric), Dfq Ask hš | Rjvavi BU I
¶mgtbUi `Zwi, wfZti e`m 3-4 ¶gUvi, Mfxi Zv 1 ¶gUvi | Rjvavti cwb cġvnnZ Kievi
bj `tjv Zjt`tkl cik̄t`tk mshš Kiv nq, hvfZ cwb eĒct_ ¶mgtbUi `Zwi Rjvavti
¶bi ¶vQbæfvte cġvnnZ nq | cġ `kj ¶ ¶Wg cġZ NbwgUvi Rjvavti cġZbb Kiv hvq | ¶Wg
cġZbbi eĒvKvi Rjvavti i wfZti tjvvi cvfZi `Zwi eĒvKvi K¶ ¶mcZ nq Ges tjvvi
K¶U bi Bj tbi `Zwi c`Pvivi AveZ Kti | GBfvte GKB Rjvavti i gta` Avi GKU AŠR¶
(inner chamber) ivLv nq | cwb i Mfxi Zv eRvq ivLevi Rb` cwb ¶:mi tYi btji e`v
_vtK/

GB n`vPwi tZ cwi Kí bv Kti gvftQi cRbb I ¶v`š cwi gvY ti Yytcvbi Drcv`b mæe/

n`vPwi i cġj t̄b m̄gamgn-

gvftQi ¶fmeK cRbb el¶ I ci ¶bf¶kij | ¶KŠ`AvaybK n`vPwi tZ ¶bqisZ cwi tetk ni tgvb
(hormone) cġq¶M el¶ cteB cġYw`Z cRbb mntR m`úbæ Kiv hvq | ¶WDetqt̄ji
(tubewell) kxZj Rtj cġYw`Z cRbb gvP¶t`K cġq t̄m̄t̄¶¶t̄ chš ¶N`Qq gym chš
¶Z. ¶¶t̄`kx gvQ ¶mj fvi Kvc, Mm̄m Kvc`Avi I ce¶t`K cRbb KivR mdj ntqt̄Q etj
Dtj - L AvftQ/

cte`Dtj ¶LZ ntqt̄Q c¶v̄j Z e`v`vq ¶Wg bó ntZv, dtj ti Yytcvbi Drcv`t̄bi msL`vi Kg
ntZv | ¶KŠ`AvaybK n`vPwi tZ ¶Wg t`K ti Yytcvbi DEit̄Yi ¶nmve cġq kZKiv 75-80% |
n`vPwi cġZbbi dtj cwi Kí bv Kti gvftQi ti Yytcvbi Drcv`b mæe nte/



mvusk t cRbbKvix gvQžK wWg msMžni cži nvcv t_žK mivžbv nq| wWg džižbvi Rb“
cmbžZ chžB Aw žRb _vKv cžqvRb| wWg džižbvi Rb“ wWgžK wewfbžaitžbi cvĭ thgb-
n“wPs nvcv, MwmRvi n“vPwi, eživKvi n“vPwi, BZ“w`žZ `vbišli Kiv nq| wWgži cwic°Zv,
cmbžZ `žxfZ Aw žRb, Zvcgvĭv, cmbi cžvvn Gme cživeK žvvn wWg džižbvi cžqv
cživevšZ nq| gvžQi žfimeK cRbb elž Ici wbfžkij| AvayžK n“vPwi žZ wqvišZ
cwi žžk ni žvib cžqvžM elž cžvB cžYw`Z cRbb mžúbaKiv mžvž|



cuVvEi gj`iqb 9.4

mWk DEti i cuK Wk iPy (✓) i b|

1| n`iPs nvcvZ e`eüZ evBti i nvcvLi AvKvi mvavi YZ KZ?

K) $2 \times 1 \times 1$ Nb ugUvi

L) $2 \times 2 \times 2$ Nb ugUvi

M) $2 \times 1 \times 3$ Nb ugUvi

N) $4 \times 2 \times 2$ Nb ugUvi

2| KvPi Rvi n`iPwi tZ Wvg t`k ti Yjcvbv weKvk tZ mvavi YZ KZ mgq j vtM?

K) 25 NbUv

L) 15 NbUv

M) 30 NbUv

N) 10 NbUv

3| eEvKvi n`iPwi i Mfxi Zv KZ?

K) 4 ugUvi

L) 2 ugUvi

M) 5 ugUvi

N) 1 ugUvi

4| MmRvi n`iPwi i cZiU (AvbgnbK 6.35 ij Uvi) Rvti KqW Wvg i vLv thZ cvti?

K) 50000 uJ

L) 5000 uJ

M) 105000 uJ

N) 150000 uJ

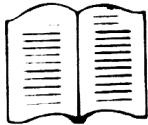
cW 9.5 cǂKwZK Dm t_ǂK tcvb mSMǂ c×vZ, tcvb tUKmBKiy, c`wks, cni enb Ges AvǂK chǂ cǂqM



G cW tǂI Avǂb –

- tcvbi cǂKwZK Dm mǂuǂK eYǂv KiǂZ cviǂeb|
- cǂKwZK Dm t_ǂK Kxfǂte ǂi Yǂtcvb mSMǂ Kiv hvq Zv RvǂǂZ cviǂeb|
- tcvb tUKmBKiyi msǂv w`ǂZ cviǂeb|
- Kxfǂte tcvb c`wks Kiv nq Zv eYǂv KiǂZ cviǂeb|
- tcvb c`wks Gi ǂKǂkj eYǂv KiǂZ cviǂeb|
- Dbǂ c×vZǂZ Kxfǂte tcvb `i-`hǂǂmi ei v n Kiv nq Zvi c×vZ eYǂv KiǂZ cviǂeb|

tcvbi cǂKwZK Dm



Kiv RvZixq gvQ Z_v iǂ, KvZjv, gǂMj BZ`w` gvQ, tjv cǂǂi Pvl Kievi Rb` mgqgZ tcvb mSMǂ Kiv nq| ǂKbbv Gme gvQ cǂǂi ex cmbǂZ wWg t`qbr| mǂZivs Gme gǂQi tcvb cǂKwZKfǂte t`qv wbr` ǂ `vb t_ǂK mSMǂ Kiv nq|

tcvbi mSMǂni Rb` PǂEMǂgi KYǂǂx b`xi Dcb`x nij`v Ges hgǂv b`xi big wǂkl fǂte Dǂj - LǂhvM`|

Avǂvǂi t`ǂk b`xi thme `vǂb gǂQi wWg I ti Yǂtcvb cǂKwZKfǂte cvl qv hvq tm, ǂjvi cǂvb KǂqKwUj big wǂwǂǂ E nǂjv t

nij`v b`xt PǂEMǂg, g`vbNvU, mvNvUvi ivg`vm nvl I bqvi nvl|

hgǂv b`xt isǂǂi dǂevox Nvl, gmbKMǂǂi Avvi PvlNvl, e, ori mmi qvKiv`x, tmvbnZjv Ges hgǂvi cvkǂZǂ evnir` yev` Nvl, dǂQw Nvl, wmi vRMǂ Nvl I Zrmsj MǂGj vKv|

epcǂb` t gqgbmsn knǂi i cvkǂZǂcǂwZb epcǂb`|

cǂvb`xt ivRkvnx tRjvi tMv`vMvnx Nvl, dmi`cǂj tRjvi w Gb we Nvl, cvebvi cvKkv Nvl, Kǂqv i vqUv Nvl, PrcvBbeveMǂǂi wKv`cǂv|

MovB b`xt Kǂqv I Kǂvi Lvj x|

gǂwZ b`xt dmi`cǂj i Kǂvi Lvj x I hǂkvǂi i kǂcǂj I tjv`vcvov|

Avovqj Lvcb`xt dmi`cǂj i KieviRcǂj, gmbKMǂ tRjvi Ziv Nvl t_ǂK tkL Nvl chǂ msj MǂGj vKv|

eoij b`xt eoij b`x thLvǂb cǂvi mǂ_ wǂj Z nǂqǂQ tmLvǂ t_ǂK ivRkvnx tRjvi Pvl Nvl `vbi AǂMǂ Avovbx ǂj t`kb chǂ|

dwi`ctji tUtKi nvtUi nbKU` Kzvi b`xtZI tcvbvgvQ aiv ntaq _vtK| gqgbwmstni DEti te, bevox tij t=kctbi cvk@ZiGjvKv t_tK i iyKti `wjtj Kuj xi evRvi tij t=kctbi cvk@ZiGjvKvq avbx tcvbv cvl qv hvq| GQovov wZ`i, Ksm, tmvtgkji x, Kvj xMsmv, Kzvi Luj x b`xl tcvbv c@Bsi Rb` i zcyq

tcubv mslm c xwz

b`xgvZK.evsj vt`tki b`x, tjvB Kvc RvZxq gvtQi ti Yytcubvri c@vb Drm| el@Kvtj (tg-AvM=) t`tki c@vb c@vb b`x, tjv t_tK tKwU tKwU ti Yytcubvri aiv nq| b`x t_tK ti Yy tcubvri aivi KvR KtqKRb tRtj wgtj GKwU `j Mvb Kti _vtK| tcvbv aivi Rb` metkl GK ai tbi Rvj e`envi Kiv nq hvtk mrvvi Rvj etj | Rvtji `N°300-360 tm.wg., Rvtji gly t_tK tkl c@sl chsl c@q 240-300 tm.wg., tktli tLijv gjt 15-22 tm.wg. Gi gZ tMjvKvi A½jv _vtK Ges metktl 75-90 tmwUngUvi gvtci GKwU MvgQv _vtK| `wjtj evtku Lwjtj mivith` Rvj LvUvtbv nq| wQtb `wjtj evtki Lwjtj _vtK| MvgQvi tkl Astk `wjtj evtku Lwjtj _vtK| Rvtji eo gly tmktzi w`tk _vtK| cwbi tmktzi mit_ wWgtcvbv Rvtji gta` Avtm, cwbi tewitq hvq, ti Yytcubvri Ave x nq| Rvtji tktli w`tk tQvU tMjvKvi tLijv gly _vtK, ZvtZ evtki ev tetzi `Zwi GKwU tMjv ai tbi A½jv _vtK Ges ti Yytcubvri ati ivLeri Rb` MvgQwU PZ`vY Kti mivRvtbv nq hvtk A½jv i ga` w`tk ti Yytcubvri Gtm MvgQvq Rgv nq Ges tetp _vtK| MvgQv Dwtq gvtS gvtS ti Yytcubvri tZijv nq Ges GKwU evtki `Zwi QvKubi Dci Xijv nq| GtZ ti Yytcubvri mit_ hiv` Ab`vb` tQvU gvtQ ev gqjv _vtK Zv QvKub w`tk ev` t`qv hvq| Zvici Rxeštji Yytcubvri nvcitZ mvgwqKfite Rgv Kiv nq|

b`xi wKviti i w`tk thLvtb ti Yytcubvri aiv coevi m@tebv tevk tmLvtb Gi Kg AtbK Rvj cici LvUvtbv nq Ges ti Yytcubvri mslm x nq| eU tRtj mvgwqKfite b`x t_tK ti Yytcubvri aivi KvR Kti RweKv ubein Kti _vtK|

tcubv cwi enb

gvQ Pvtl tcvbv cwi enb L@B i zcyq fvgKv cvj b Kti | Kvi Y GKgvI mY` I mej tcvbv gvQPvtl mdj Zv AvbtZ cvti | ZvB tcvbv cwi enb e`vcvti i zj t`qv c@qvRb| tcvbv cwi enb mgq `jlv wRvtli c@z j q` ivLtz nte Av tRtbi Afite tcvbv thb cwbi Dcti tftm bv Dtv Ges cwi enb mgq thb tcvbv AvNvZ c@B bv nq|

tcubv cwi enb cte@wQvMkQvmbqgvej x tgbt Pjv DvPZ| tKbbv `i` i`stl tcvbv cwi enb GKwU Kómva` KvR| Kvi b tcvbv Pvjv t`qvi mgq av°vaw°, hibeivtbi Amjev, nimo tftz hvl qv, cwbi e`tj i Amjev cfvz. Kvi tY eU tcvbv gviv hvq| ZvB tcvbv cwi enb Kvtj ht_ó mveavbZv Aejev Kivi c@qvRbqvZv itqtQ| GRb` tcvbv cwi enb cte@tcubvtK KivKubs ev tUKmB Kitz nte|

tcubv tUKmBK i Y (Conditioning of fry)

tcubv cwi enb mgq hvtkZ gviv bv hvq A_er Kg gviv hvq tmRb` tcvbv tK tUKmB Kti wbtZ nq| cwi enb mgqUv hiv` L@ Kg nq A_@ KvQvKwQ tKub` vtb cwi enb Kitz nq Zintj Rvtji gta` tcvbv titL Pvi w`K t_tK cwbi c@v w`tz nq| GtZ tcvbv Av RvqMvq _vKtZ Af`Inte Avi cwbi c@v Av tRtbi mieivn nI qvi mit_ mit_ tcvbv fq tctq ZvovZvmo gj gF` Z`vM Kti I emg Kti tCu tek Luj x Kti tdj te| GtZ cwi enb Kvtj tcvbv gj gF` Z`vM Kti cwbi bó Kite bv|

b`xgvZK.evsj vt`tki b`x, tjvB Kvc RvZxq gvtQi ti Yytcubvri c@vb Drm|

b`xi wKviti i w`tk thLvtb ti Yytcubvri aiv coevi m@tebv tevk tmLvtb AtbK mrvvi Rvj cici LvUvtbv nq Ges ti Yytcubvri mslm nq|

tcubv cwi enb mgq `jlv wRvtli c@z j q` ivLtz nte Av tRtbi Afite tcvbv thb cwbi Dcti tftm bv Dtv Ges cwi enb mgq thb tcvbv AvNvZ c@B bv nq|

tcubv cwi enb mgq hvtkZ gviv bv hvq A_er Kg gviv hvq tmRb` tcvbv tK tUKmB Kti wbtZ nq|

hw` cwi enb mgqUv`xN⁶
nq Zte tcvbtk Avi I
tUKmB Ki tZ nte|
GRb` tcvbtk cKzi
nvcvq ti tL A_ev
tPŠev`Pvq Aí cmbi
cĕvtn ti tL GKir b
Dcevtm ivL tZ nte|

hw` cwi enb mgqUv`xN⁶ nq Zte tcvbtk Avi I tUKmB Ki tZ nte| GRb` tcvbtk cKzi nvcvq ti tL A_ev tPŠev`Pvq Aí cmbi cĕvtn ti tL GKir b Dcevtm ivL tZ nte| tcvb₃ t₃v nvcvq tQvUvQ₃ Ki tZ _vtK Ges G tZ cĕq tcl m⁶úY⁹Lwj nq hvte hvi dtj cwi enbKvj xb S⁶mK tZ ewg ev gj Z⁶vM br Kivi Kvi tY cwi enb cvtĪi cmb bó n tZ cvti br Ges tcvbri Aí RvqMvq Ae`v tbi Af`im Mto DVte|

tcvbr cwi entbi cjuZb c xwZ

A t b K Av t M t_ t K Avgv t` i t` t k tcvbr gvQ gvU_i cvtĪ cwi enb Kiv nq Avm t Q| eZ₃gv t B Aek` avZe cvĪ thgb- tK t i v m t b i ũ b, Kiv v ev A`ij vgv b qv t gi c w Z j I GK v t R e`eüZ n t` Q| Zte th t n Z z a v Ze cvtĪi cmb Z v o v Z m o Mig n t q h v q d t j t c v b r g v i v t h t Z c v t i | t m t` q t Ī t f R v K v c o ev P U c m b t Z v f i R t q c v t Ī i M r t q R v o t q i v L t j c v Ī m n t R B M i g n q b v | G K R b v e t` m Z v G K m s t M` ũ b n m o K v t a e n b K i e v i R b` ũ o i ũ k` o v m n e t k i` Z v i G K i U e v k i e` e n v i K t i _ v t K | G K i U c v t Ī 30-35 v j U v i c m b a i t Z c v t i | ũ b n m o t Z b` x i ev c k z i i c m b A v a v A m a g Z b f i u Z` K t i ũ K Q j v j g m U ũ g v k t q A v b g v m b K 40000-60000 ũ U t i Y y t c v b r i c Ī Z n m o t Z ũ b t q h v i v i i y n q | n m o i g t L M v g Q v _ v t K m s t M t Q v e v t k i S ũ | G f i t e B t i t j, e v t m, j i x t Z e n b K i v n q | t h L v t b t K v b c w i e n b t b B, g v b t j i K v t a m e P ũ e Z i b K i v n q | n m o i c m b t K m e m g q S v K v t Z G e s g v t S g v t S _ v c o v t Z n q | g v t S g v t S n m o i g t a` b r i t K t j i` ũ o ũ t q t c v b t q g i v t i Y y t c v b r t d t j ũ t Z n q | M Š e` v t b t c Š Q e v i A v M c h Š i m e m g q B g t b v t h v M m n K v t i G m e K v R K i t Z n q |

nmo tZ tcvbr cwi enbKvtj v b a j v L Z m e a v b Z v A e j` b K i v D i P Z

tcvbr cwi enb Kvtj
nmo tZ teik teik Ges
Lg tRvti SvKvbx t`qv
ũ/K bq| Kvi Y ZvtZ
A t b K t c v b r n m o i M r t q
a v` v t L t q R L g n t Z
c v t i |

1| tcvbr cwi enb Kvtj nmo tZ teik teik Ges Lg tRvti SvKvbx t`qv ũ/K bq| Kvi Y ZvtZ A t b K t c v b r n m o i M r t q a v` v t L t q R L g n t Z c v t i |

2| tcvbr cwi enbKvtj cmb e`j v t b v i R b` e v j ũ Z, g M I M v g Q v c f ũ Z. m i A v g m s t M i v L v` i K v i |

3| kn t i i t U c ev K t j i c m b ũ t q n m o i c m b e` j v t b v D i P Z b q, K v i Y Z v t Z t K w i b M` v m _ v t K G e s t c v b r g v i v h v q |

4| c m b m e` v B a x t i m t j` e` j v t b v D i P Z | n m o i c m b i Z v c g v Ī v I b Z b c m b i Z v c g v Ī v i ũ e v f b ũ Z v t c v b r m n` K i t Z c v t i b v | Z i B b Z b c m b c` Y` K i v i A v t M h Z` j y m` e b Z b I c j v Z b c m b i Z v i Z g` j` q` K t i t b q v D i P Z |

5| c w i e n b K v t j h w` t K v b t c v b r R L g n q ev g v i v h v q Z v n t j D n v t K m e a v t b n m o t_ t K D i v t q t d j t Z n t e |

6| t c v b r _ t j v i g a` t_ t K i v` q t m g v t Q i t c v b r I t c v K v g v K o m i i t q t d j t Z n t e |

k v i v i K c w i k g, ũ b o v I m e a v b Z v m t E j l c j v Z b c x w Z t Z t c v b r c w i e n t b t c v b r i m g r` q ũ Z n l q v i m` e b v _ v t K | t m R b` ũ K Q v i A ũ b o q Z v G e` e m v q m e m g q _ v t K | Z i B t c v b r A v i I m g` v i t e I ũ b i v c t` t c Š Q e v i e` e` v i K _ v f i e v` i K v i h v t Z t c v b r i q ũ Z L g m g v b` B n q |

tcvbr cwi entbi Dbz (AvanbK) cxiZ

G cxiZtZ tcvbr cij_w_b e`vM Aw tRb w`tq cwi enb Kiv nq| G cxiZ LyB ubivc` I Srtgj vgy| Gfite tcvbr cZ`šl AAtj cwi enb Kiv mae| AvanbK cxiZtZ tcvbr cwi entbi Rb`ub`mj LZ mi Avtgi cDqvRb nq

- 1| cmóK ev cij_w_b e`vM
- 2| Aw tRb umij Úvi
- 3| ivertii bj
- 4| tevW`KvMR
- 5| nij Kv KvtVi ev , Pti _tj BZ`w` |

AvanbK cxiZtZ cij_w_b e`vM Aw tRb w`tq tcvbr cwi enb Kiv nq|



Ablyj b (Activity) t aily, Avcub Avcbri cktzi 2 nvrvi tcvbr Qvoteb| D³ tcvbr `fi i tKvb n`vPwi t`tk Kxfite cwi enY Kti Avbteb Zv hy³mnKvti wj Lly|

tcvbr c`wKs

1| mvari YZ cDZu c`vtKtUi Rb `wD Kti cij_w_b e`vM e`envi Kiv DvPZ Kvi Y``eµtg hwi GKwU e`vM uQ`antq hvq Zvntj uDZxqU cwb I Aw tRb mn tcvbrtK i qv Ki tZ m`lg nte|

2| mgvb AvKvtii `gU cij_w_tbi e`vM GKwU AvtiKuUi wFZi XwKtq w`tq GKwU e`vM cwi bZ Ki tZ nte Ges ubtPi Ask KZwKtq w`tq k³ Kti iwk w`tq evatZ nte hvfZ cij_w_tbi tRvov uQto wltq cwb cto bv hvq| cij_w_tbi e`vM wevfbaeAvKvtii ntZ cti | cwi entbi mjev Ablyvqx GuU `Zwi Kiv thtZ cvti |

3| c`wKs cte³tcvbr th cwb tZ ivLv nq mvari YZ t tmB cwb tZ tcvbr cwi enb Kiv DvPZ| ZvB GKB Dm ntZ GKB Zvcgrvvi cwb Geri cij_w_b e`vM XKvtZ nte Ges e`vMi 1/3 Ask cwb tZ fivZ³Ki tZ nte|

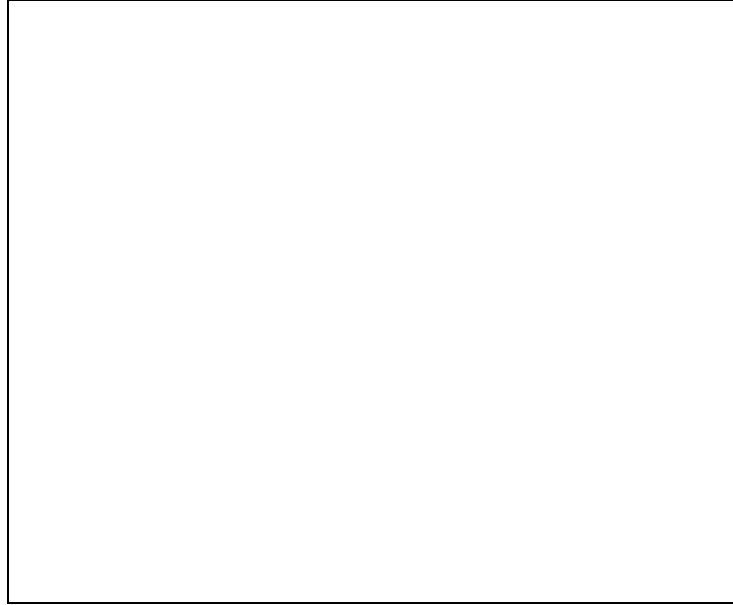
4| cwb fivZ³Kivi ci e`vMi Dcwi fivM nVZ w`tq gDvotq GK nvtZ ai tZ nte Gs ubtPi Ask AvtiK nVZ w`tq ati e`vM uD tK Dv`etq I Nvj tq t`L tZ nte tKvb uQ`a c`_ cwb tewi tq hvq wKbv| uQ`ah³ e`vM cwi nvi Ki tZ nte|

5| cwb fivZ³e`vM tcvbr fi tZ nte| KZ_tjv tcvbr GKwU e`vM fi tZ nte Zv ct_i `tZi Ges eM³tcvbrvi AvKvtii Dci wbfP Kti | 36x24 BwA AvKvtii e`vM `g w`tbi hvvq 1/2 t`tk 2 BwA AvKvtii h_vµtg 3000 t`tk 1000 tcvbr cwi enb Kiv Pti | cwi enb `tZi tewk ntj tcvbrvi msL`v Kgte Ges `tZi Kg ntj tcvbrvi msL`v tewk nte|

cwi enb `iZi tewk ntj e`vM tcvbrvi msL`v Kg nte Ges `tZi Kg ntj tcvbrvi msL`v tewk nte|

6| cij_w_b e`vM tcvbr XKvtbri ci Aw tRb umij Úvi t`tk btj i mivvth` mZKZvi mvt_ e`vM Aw tRb XKvtZ nte Ges e`vMi 2/3 Ask Aw tRb w`tq cY³Ki tZ nte| Aw tRb t`qvi mvt_ mvt_ e`vMi gly k³ Kti teta w`tZ nte hvfZ Aw tRb tewi tq bv hvq| GLvth Dti - L` th, Aw tRb mi ei vtni AvtM e`vMi glyu Avj tZv fite gDvotq ubtZ nte (wP`-76)|





76 t tcvb cwi enb | (1) Lwj Ub (2) Aw tRb wmwj Uvi (3) Aw tRb Mvimi bj (4) cwb I tcvbmn cij w_b e'vM (5) Ub eU Kievi XvKbv |

7 | Pti e'vM I Kuv e'envi

tcvbm tcvPKv evav cij w_b e'vMU cwi entbi mjevav Pti e'vM, Ub A_ev Kuvbi wFZi XvKtq wbtZ nte | Pti e'vM A_ev Kuvbi cij w_b e'vMUtK w b i v c t` i v L t Z m n v q Z v K t i | Pti e'vM e'envi Kij Dnv gvtS gvtS cwb w tq w f i R t q w t q e'vM i c w b i Z v c g v i v e p x t i v a K i v h v q | G t Z t c v b v f v j _ v t K (w P T - 7 6) |

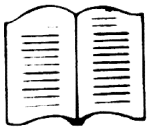
mZKZv

(1) hvZvqtZi mgq j 7 i v L t Z n t e h v t Z t c v b r i e v m e m g q Q v q v G e s w b i v c ` v t b _ v t K | t K v b f v t e h v t Z e'vM w Q ` b v n q e v t d t U b v h v q t m w t K w e t k l ` w o i v L t Z n t e |

(2) MSe'v b t c s t Q e v e v P t i _ t j t _ t K e'v M u L t j c k z i i c w b t Z w g u b U c v t P K t d t j t i t L e'v M i g l y L t j t d j t Z n t e |

e'vMi gly tLjvi mgq AwZ mZKZvi mwnZ axti axti Ljy tdj tZ nte |

(3) e'vMi gly tLjvi mgq AwZ mZKZvi mwnZ axti axti Ljy tdj tZ nte | Kvi Y Aw tRtbi Pvc axti axti bv Kvgtq nViv Kti gly Ljy tdj tj cwi tetki AvKwSK cwi eZtbi Rb tcvbvi 7wZ nI qvi mtebr_vtK |



mvusk t c0KwZK Drm t_tK cRbb Kvtj wevfbab`x t_tK mrvivi Rvj bvgK GK ai tYi w e t k l R v j O v i v t c v b v m s M h K i v n q | t c v b v c w i e n Y K v t j h v t Z g v i v b v h v q t m R b t c v b v t U K m B K i Y K i t Z n q | c j v Z b c x w Z t Z n w o t Z G e s A v a n b K c x w Z t Z A w t R b c Y c i j w _ b e'vM t c v b v c w i e n Y K i v n q |



cuVvEi gj`iqb 9.5

mW/K DEti i cuK uJK iPy (✓)w b|

1/ tKv_v t_tK iB, KvZjv l gMti i tiYjcvbv msMh Kiv nq bv?

- K) PAMtgi nvj`v b`x
- L) gqgbwstni cijvZb epcy`b`
- M) Ki tZvqv b`x
- N) hgbr b`x

2/ tKvbW nmo tZ tcvbv cwi entbi mgm`v bq?

- K) cmb tZ O₂ `f Zv t`Lv t`q
- L) cmb tZ CO₂ Gi cwi gvY tefo hvq
- M) cmbi uc GBP Ktg hvq
- N) Lv`i Afve cwi j wZ nq

3/ mvfvi Rvtj i `N`mvavi YZ KZ tmwUngUvi ?

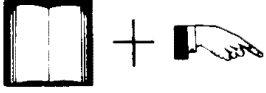
- K) 300-360 tmwUngUvi
- L) 130-260 tmwUngUvi
- M) 120-240 tmwUngUvi
- N) 100-150 tmwUngUvi

4/ cij w_b e`vM tcvbv cwi entbi Rb` cij w_b e`vMi KZ Ask cmb tZ fivZ`Ki tZ nq?

- K) 2/3 Ask
- L) 1/3 Ask
- M) 3/4 Ask
- N) 1/2 Ask

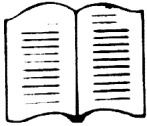
e'enwi K

cw 9.6 ucUBUvi x Mš' msMā, msi ųY Ges ni tġub BbġRkKb cġqM c×vZ



G cw tkġI Avcġb –

■ ucUBUvi x Mš' msMā, msi ųY Ges ni tġub BbġRkKb cġqM c×vZ m=utK[©]e'enwi K Avb j vF Ki tZ cvi teb|



uc.ųR. msMā

- 1| gv_{vi} L_{ij} i ųKQyAsk Dci t_ġK n_vZ KivZ ų_ġ tKġU tġj ġ|
- 2| L_{ij} mi v_tb_{vi} ci th ami P_{ie}RvZ_{iq} c_vġ_ġ L_v h_ġte Z_v Z_j v_ġ ų_ġ m_{ii} t_ġ tġj ġ|
- 3| gv_ġ P_ġK Av_ġ ġAv_ġ ġD_ġK_ġ i ųC_Qt_ġbi ų_ġK tġt_ġ ų_ġb|
- 4| GL_b t_Qv_U GK_ųU M_ġZ_ġuc.ųR. t_ġ L_v h_ġte| m_P ev ųP_gU_v ų_ġ t_ġ L_ġ m_{ve}av_tb uc.ųR. M_Zġ_ġ t_ġK Z_ġ ų_{bb}|

uc.ųR. msi ųY

- 1| msM_ġxZ uc.ųR. GK_ųU f_vq_vt_ġ Gem_{ij} DU A_ġv_ġ t_ġK_vn_tġ i v_Lġ|
- 2| 24 N_vU_v ci A_ġv_ġ t_ġK_vn_ġ c_{ii} e_Zġ K_ġ b_Zġ A_ġv_ġ t_ġK_vn_ġ ų_ġb| G Ae_ġv_q Q_vq_{ih}ġ_ġ V_ųų_vġ_ġ A_ġev t_i ų_dR_vt_i U_ti e_ġen_vt_i i ce_ġch_ġs_ġf_{msi} ųY Ki tZ cvi teb|

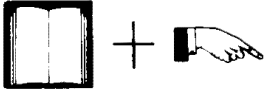
uc.ųR. ħY ħZii

- 1| gv_ġQ BbġRkKb t_ġq_{vi} ųK ce_ġġy tZ_ġuc.ųR. ħY ħZii Ki ġ|
- 2| c_ġt_ġgv_ġQ_i m_vB_ġR_i I ci ųf_ġġ_ġ K_ġ i uc.ųR. i c_{ii} gv_Y ev ms_Lġ_v ų_{bb} ħ_ġ Ki ġ|
- 3| A_ġv_ġ t_ġK_vn_ġ t_ġġ_ġ tei K_ġ i uc.ųR. t_ġK GK_ųU ų_dġ_{vi} K_vM_ġR_i Dci 1-2 ųġ_{ub}U i v_Lġ|
- 4| i_ġK_ġt_ġv_ġ uc.ųR. t_ġK m_vġ_{ub} c_{ii} m_ZZ_ġ c_{ii}b ev 0.3% m_var_{ib} je_ġY_i ħ_ġY_{mn} GK_ųU ų_Um_ġt_ġų_ġgv_ġR_{bi}BR_vt_i ų_{bb}|
- 5| GL_b GK_ųU ħ_ġų_i m_vn_vt_ġ uc.ųR. t_ġK t_ġġY Ki ġ|
- 6| c_ġq_vR_ġx_q N_bt_ġZ_ġ ħ_ġY c_{vi} h_{ri} R_b t_ġġYKZ. uc.ųR. t_ġZ c_ġq_vR_tb Av_tiv c_{ii}b ev je_Y ħ_ġY th_ųM Ki ġ|
- 7| uc.ųR. i m_vm_tcb_{kb} t_ġv_tgv_ġR_{bi}BR_{vi} t_ġġ_ġ ų_{UD}t_ġ K_ġ i GK_ųU t_ġm_ųU_ġd_{DR} t_ġġ_ġt_ġ ħ_ġv_ġš_ġ Ki ġ|
- 8| ų_ġġ_ġ P_vġj Z t_ġm_ųU_ġd_{DR} t_ġġ_ġt_ġ 3000-4000 Av_i uc G_g-G 5-10 ųġ_{ub}U t_ġm_ųU_ġd_{DR} Ki ġ|
- 9| D_ġt_ġ i c_{ii} ħ_ġY BbġRkKb t_ġq_{vi} R_b ų_{ii} t_ġġ_ġ D_ųW_tq ų_{bb}|

BbġRkKb cġqM c×vZ

- 1| gv_ġQ_i c_ġR_vZ I Av_Kvi Ab_ġv_qx BbġRkK_tbi t_Wv_R ev gv_ġv_ġ ų_{ii}m_{ve} K_ġ i ų_{bb}|
- 2| A_ġv_ġk_ġh_ġ gv_ġQ n_tġ t_ġġ_ġR_i A_ġġ_ġ ev c_ġ c_{vi}L_{br}i ų_{bb}t_ġP Ges c_ġv_ġġ_ġi L_{vi} Dci GK_ųU A_ġv_ġt_ġki ų_{bb}t_ġP c_ġt_ġ t_ġġ_ġ m_{gv}š_ġġ_ġ t_ġġ_ġ Ges c_ġt_ġ 45⁰ t_ġK_ġY m_ġc_ġġ_{ek} Ki v_ġ|

cw 9.7 tcvb/`iYyUKmBKiy, c`wks I cwi enb cxvZ tkLv



G cw tk`I Avcb –

- tcvb tUKmBKiy m`utK`e`enwi K Avb jvf Kitz cvi`eb|
- tcvb c`wks I cwi enY m`utK`ej tZ I wj LtZ cvi`eb|



tUKmBKiy

- 1| Rv`j i gta` tcvb ti`L Pvi`w K t`_tK cwi c`evn w`b|
- 2| tcvb tK c`kzi nvcvq ti`L A_ev tP`sev`Piq Aí cwi c`evn tKvb Lvevi bv w`tq GKw`b ivLy|
- 3| Dch`y cxvZ Avcbri e`enwi K LvZvq wj w`ce`x Kily Ges Avcbri tUDUi`K t`_wL`tq `v`ji wbb|

c`wks I cwi enb

- 1| m`y`avgZ AvKv`i i `w`j cvj w`_b e`vM GKwU Avi GKwUi w`fZi XwK`tq w`b Ges w`b`Pi Ask K`v`wK`tq w`tq k`³ Kti i`w`k w`tq ev`aly|
- 2| tcvb th cwi b`tZ ivLv w`Qj tm GKB cwi w`tq e`v`M 1/3 Ask c`Y`Kily |
- 3| ct`_i `t`_Zj I tcvbri AvKvi Ab`jv`qx w`bw`_`m`L`K/cwi gvY tcvbri e`v`M fivZ`Kily |
- 4| Av` tRb w`w`ij Uvi t`_tK b`tj i m`v`v`th` mZ`R`Zvi m`v`_ e`v`M Av` tRb XwK`tq e`v`M Lw`j 2/3 Ask c`Y`Kily Ges e`v`M gly k`³ Kti i`w`k w`tq ev`aly|
- 5| tcvb fivZ`c`w`j w`_b e`v`M tKvb P`t`Ui e`v`M, KvU`y A_ev w`Ut`bi ev`t. `v`cb Kily |
- 6| cwi enYKv`tj tcvbri e`v`M w`U`Qv`q`h`y `v`tb ivLy| P`t`Ui e`v`M n`tj Zv cwi w`tq gv`S gv`S w`f`w`R`tq w`b|
- 7| Dch`y Kvh`e`j`x aviv`w`n`K`f`ite Av`y`i`Y Kti e`enwi K LvZvq wj Lly Ges Avcbri w`UDUi`K t`_wL`tq `v`ji wbb|



Povšgji`iqb

msw`jB I iPbigj-K c`kæ

- 1| grm` cRbb Kx?
- 2| c`Yw` Z cRb`b Ki Yxq Kx Zv mst`jtc wj Lj|
- 3| cRbb`jg gvQ cij `bi Rb` Kxfite c`kz c`Z Ki`eb?
- 4| cRbb`jg gvQ wbe`p`bi `emkó` , tj v wj Lj?
- 5| cRbb`jg gvQi c`kzi m`ú`i-K Lv` c`qvm c`wZ eY`v Kij |
- 6| cRbb`jg gvQi cwi c` Zv Zij m`SZ Kivi Kji`K`Kj eY`v Kij |
- 7| w.c.wR. mSM`ni c`wZ eY`v Kij
- 8| Kxfite w.c.wR. msi`jY Kiv nq Ges Bb`R`Kkb `èY c`Z Kiv nq eY`v Kij |
- 9| gvQ Kxfite w.c.wR. `èY Bb`R`Kkb t`qv nq Zv wj Lj|
- 10| wWg d`b`bvi c`fveKmg`ni eY`v w`b|
- 11| wWg d`b`bvi w`fba`c`f`i msw`jB eY`v w`b|
- 12| c`Kw`Z`K Drm t`_`tK Kxfite ti Yj`c`v mSM`h Kiv nq eY`v Kij |
- 13| evsj v``ki t`Kv&t`Kv&`vb t`_`tK i`j, KvZj v I g`Mj gvQi t`c`v mSM`h Kiv nq Zv wj Lj|
- 14| AvaybK c`wZ`Z Kxfite t`c`v cwi`enb Kiv nq Zv eY`v Kij |



D`i`gji v

cW 9.1

- | | | | |
|------|------|------|------|
| 1 M | 2 K | 3 M | 4 N |
|------|------|------|------|

cW 9.2

- | | | | | |
|------|------|------|------|------|
| 1 L | 2 M | 3 K | 4 L | 5 N |
|------|------|------|------|------|

cW 9.3

- | | | | | |
|------|------|------|------|------|
| 1 M | 2 L | 3 L | 4 K | 5 N |
|------|------|------|------|------|

cW 9.4

- | | | | |
|------|------|------|------|
| 1 K | 2 L | 3 N | 4 K |
|------|------|------|------|

cW 9.5

- | | | | |
|------|------|------|------|
| 1 M | 2 N | 3 K | 4 L |
|------|------|------|------|

G Avtbi cãb`enkómgã

1. G Avtbi gvQ ej tZ mKj Kuvj Rbvm, tevbx wdk, cã, wk`ú, Ggwdieqvb, Ui UtqR, Uvi Uj m, μv÷vmqvb, G`vbtgj m, tgvj v`m Ges BKvBtbrWig©Gi RiebPtμi mKj avc`K eSvte|

2. G Avtbi wdkvni ej tZ mKj cKvi Rj vkq, cãKwZK ev Kuv g, gS ev Ave×, tmiZ`x ev w`i, thLv`b gvQ Drcv`b, msi`Y, cãkã, cãRbb, Avni Y BZ`w` KgRvU RwoZ; Zte Kuv g AvKqvmi qvg D³ Avtbi Avl Zvf` nte bv|

3. b`x-bvj v, Lvj -wetj`vqx`vcvri gva`tg (wd· W BwAb) grm` Avni Y Kiv hvte bv, Gifc t`q`I`vqx`vcvri mxR Acvni Y I ev`RqvB Kiv hvte|

4. Rj tmP, eb`v wqS`Y ev b`gvi D`i`k` e`ZxZ b`x- bvj v, Lvj wetj` A`vqx ev`vqx, evel BZ`w` ev tKvb ifc AeKvWtgv wbg`Y Kiv hvte bv|

5. Af`si`xY ev DcKj xq Rj vfiqtZ wet`vri K, e`x` ev Zxi abk` e`envi Kti grm` Avni Y ev Avni tYi c`t`q`c MhY Kiv hvte bv|

6. Af`si`xY Rj vfiqtZ wcl`cãqvm, cj`ykb, emv`w`K eR`ev Ab`nea Dcv`tq gvQ a`sm ev a`stmi c`t`q`c MhY Kiv hvte bv|

7. P`v`li D`i`k` e`ZxZ mvavi Yfvte b`x-bvj v, Lvj I wetj` msthvM AvtQ Gifc Rj vk`tg cãZ eQi 1j v Gucj` t`tK 31 tk AvM÷ chS`mg`tg tkvj, MRvi, UvK gvtQi tcvvri SxK ev`v`wZ gvQ aiv ev a`sm Kivi c`t`q`c MhY Kiv hvte bv|

8. P`v`li D`i`k` aivi Rb`h_vh_ KZet`ji w`bKU t`tK (eZg`vb msukw` tRj v grm` KgRZ`Þ) w`baf`i Z w`d`i w`vbg`tg j`vB`tm`Y cãB bv ntj w`væ× 27w b`x, Lvj BZ`w` tZ w`baf`i Z mg`tg th tKvb AvKwZi i`B, KvZj v, g`tMj, Kuvj evDm Ges Nibqv Avni Y ev Avni tYi c`t`q`c MhY Kiv hvte bv|

9. P`v`li D`i`k` e`ZxZ tKvb e`ir³

K. cãZ eQi RjvB-w`tm`v` mg`tg 23 tm.wg. Gi w`b`Pi AvKv`ti KivZj v, i`B, g`tMj, Kuvj evDm, Nibqv;

L. cãZ eQi b`tf`v`-Gucj` mg`tg 23 tm.wg. Gi w`b`Pi AvKv`ti i`B, KvZj v, g`tMj, Kuvj evDm, Nibqv, Buj k, cisMvm aiv AvBbZ`Übxq Aciva|

M. cãZ eQi b`tf`v`-Gucj` mg`tg 23 tm.wg. Gi w`b`Pi AvKv`ti cisMvm

N. cãZ eQi tde`v`vix-Rly mg`tg 30 tm.wg. Gi w`b`Pi AvKv`ti w`kjs

O. cãZ eQi tde`v`vix-Rly mg`tg 30 tm.wg. Gi w`b`Pi AvKv`ti tevqj

23 tm.wg. Gi w`b`Pi AvKv`ti Buj k gvQ`K RvUKv etj |

23 tm.wg. Gi w`b`Pi AvKv`ti i`B, KvZj v, g`tMj, Kuvj evDm, Nibqv, Buj k, cisMvm aiv AvBbZ`Übxq Aciva|

Kul. I cju Dbqbb ֆ

P. cūZ eQi tdebrix-Ry mgtq 30 tm.ug. Gi wbtPi AvKviti i AvBi aitZ, cwienb
KitZ, cūvb KitZ ev wbr[~]GLwZqtii i vLtz cwi te br|

10. evRqvBKZ.gvQ wbj vtg wep q Kiv hite|

11. RweZ ev gZ e'v0 aiv, enb Kiv, cwienb Kiv ev GLwZqtii i vLv wbl x|

12. gvQ aivi tqt 4.5 tm.ug. ev Z`vtcqv Kg e'vm ev `tN⁹ dwn wekó dwn Rivj
(cPvj Z bvg Kviti>U Rivj) Gi e'envi wbl x|

13. K. cūgevi AvBb f½Kvixi kw`li cwi gvY nte Kgctq 1 gvm ntZ mtv⁹ 6 gv⁹mi mkt
Kiv v`U Ges mte⁹P 1000/- UvKv Rwi gvbr|

L. cieZr^{cū}Zevi AvBb fstMi Rb` Kg ctq 2 gvm ntZ 1 eQi mkt Kiv v`U Ges mte⁹P
2000/- UvKv Rwi gvbr |

14. AvBb f½KvixiK tqt wek⁹l webr l qvti >U G`viti ÷ Kiv hite|

15. AvBtbi qgZv cūqMKvix

K. mKj wZxq tkYxi g`vRt ÷ U

L. cju k wefv⁹mi mve-BYtc±i c`gh⁹vi wbtP bq Ggb KgRZ⁹

M. eb wefv⁹mi mxi eb wefv⁹mi tWc⁹ti Avti i c`gh⁹vi wbtP bq Ggb KgRZ⁹

N. grm` wefv⁹mi wdkwi Awdmvi (eZ⁹vtb _vbr grm` KgRZ⁹) Gi c`gh⁹vi wbtP bq
Ggb KgRZ⁹

16. GB AvBtbi Avl Zvq mij wek⁹tm MpxZ tkvb c`tqtci weix e'e`v MhY Kiv hite br|



Ablyj b (Activity) t Avcbvi GjuKvq grm` msi qY AvBb (1950) f½Kvix th mKj
KgRvU we`gvb tm.tjv wj Lly Ges Zv cūZtiva Kivi Rb` Avcbvi mýúó gZvgZ
h⁹mnKviti Dc`vcb Kily|

L. w tguib wdkwi R AvB vY 1984 (AvB vY bs-35. 1983)t

mvavi Yfvte GuU mgy⁹K gvrn` AvBb, 1983 brtg cwi wPZ| D³ Aa`vt`tki Avl Zvq
cieZr⁹Z Avl l wQv⁹earb Rvix Kiv ntqtQ|

G AvBtbi cūvb `enkó mgn

1. G AvBtbi Dtíkvejxi h_vh_ cūqM, mgy⁹K gvrn` m⁹ú` e'e`vcbv, msi qY,
mzv⁹v⁹fkb l Dbq⁹tbi mweR` vq-`wqZj GKRB cwi Pj K (eZ⁹vtb Dc-cwi Pj K, mgy⁹K
gvrn`, PUM⁹) Gi Dci b`v`l|

2. cūZw gvrn` tbShvb (Uj vi Ges hwiš K grm` tbShvb) Gi Rb` wba⁹ti Z w d cūvb mvtc⁹q
(tqt wek⁹l 200/00- 18000/00 UvKv) evrmwi K wcliks jvB⁹tmY (Rivgyvix-wl⁹tm⁹
tgqv⁹) MhY eva`Zvgj-K|

BDwbU-10

gvQ aivi tqt 4.5
tm.ug. ev Zvi tqt Kg
e'vm ev `tN⁹ dwn
wekó dwn Rivj (cPvj Z
bvg Kviti>U Rivj) Gi
e'envi wbl x|

cūZw gvrn` tbShvb (Uj vi
Ges hwišK grm` tbShvb)
Gi Rb` wba⁹ti Z w d cūvb
mvtc⁹q (tqt wek⁹l
200/00-18000/00
UvKv) evrmwi K wcliks
jvB⁹tmY (Rivgyvix-wl⁹tm⁹
tgqv⁹) MhY

3. jvBtmYavixi Rb` AvniYKZ. I weμqKZ.grm` m=umKZ Z_w` cwi Pj K-Gi ubKU mieivn Kiv eva`Zigj-K|

4. jvBtmYKZ.grm` tbsHvb-Rvnr Pj vPj ct_ weNamió KitZ cvi te br|

5. jvBtmYavixi wKsev wec`M0' ev AvBvbvM c0qvRb e`ZxZ evsj vt`tki grm` Rj mXgVq tKvb wef`kx grm` tbsHvtbi AvMgb ubw x|

A%ea Abz@ekKvi x wef`kx grm` tbsHvb mi Kvti i Abjtj evfRqvB nte|

6. A%ea Abz@ekKvi x wef`kx grm` tbsHvb mi Kvti i Abjtj evfRqvB nte|

7. miKvi th tKvb tbsRvnrR ev e`w3tK evsj vt`tki Rj mXgVq `eAvmbK MteIYvi Rb` kZmctf AbgnZ c0vtbi GLwZqvi msi qY Ktib|

8. A_ivBRW Avdmvi grm` tbsHvb _vgvfv, cixqv Kiv, AsMtB c0ek Kiv, tbsRvnrR evfRqvBKiY BZ`w` c`fjc M0Y KitZ cvi tib|

9. mXRKZ.tfjmj I μztK ubKUeZx`ti tbqv hvte|

10. Aa`vt`tki aviv c0qvMti Dti`tk` webr I qvti`U AvUKKZ.e`w3tK ubKUeZx`_vbrq n`vsi KiZ nte|

11. cBbkxj `e`w` weμqthvM|

12. A_ivBRW Avdmvi ev Zvi AbMgx KZR Aa`vt`tki c0vZ weavbrej x c0qvMti Dti`tk` mij wekvtm MpxZ c`fjcti wei`x tKvb ifc e`e`v M0Y Kiv hvte br|

13. Rvtj i dvtmi AvKvi nte ub=efc -

wPsw aivi Uj vti i Rvtj i KW c0tSli dvtmi AvKvi nte Kgctq 45 wgvj wgvli |

- K. wPsw aivi Uj vti i Rvtj i KW c0tSli dvtmi AvKvi nte Kgctq 45 wgvj wgvli |
- L. gvQ aivi Uj vti i Rvtj i KW c0tSli dvtmi AvKvi nte Kgctq 60 wgvj wgvli |
- M. eo dwhj fmvb Rvtj i dvtmi AvKvi nte Kgctq 200 wgvj wgvli |
- N. tQvU dwhj fmvb Rvtj i dvtmi AvKvi nte Kgctq 100 wgvj wgvli |
- O.teu`x Rvtj i KW c0tSli dvtmi AvKvi nte Kgctq 30 wgvj wgvli |

mtePp tRvqvti teu`x Rvj, eokx, tQvU I eo dvtmi fmvb Rvj 0viv 40 wgvli Mfxi Zv chSf grm` Avni Y Gj vKv mXgve x|

14. evfRqvBKZ.tbsHvb Dnvi mg`q AvblywzKmn mi Kvi KZR.ub`umE`thvM|

- 15. grm` Avni Y Gj vKv
 - K. mtePp tRvqvti teu`x Rvj, eokx, tQvU I eo dvtmi fmvb Rvj 0viv 40 wgvli Mfxi Zv chSf grm` Avni Y Gj vKv mXgve x
 - L. mtePp tRvqvti 40 wgvli Mfxi Zvi evBti Uj vi 0viv grm` wPsw Avni Y Gj vKv ubavf Z|

16. th me cXwZtZ gvQ Avni Y ubw x

wf`vvi K, weI Ges Ab`vb` AekKvi x `e`w` e`envi ubw x|

K. wevae x wevb`R Gi Kg dwh wek0 Rvtj i e`envi gvQvi Pvl I e`e`vcbv

Kul. I c j D b q b ̄ ǵ

L. Ƶeʃuvi K, Ƶel Ges Ab'vb' AekKvix ̄ ̄'w' e' envi
M. th tKvb mvgv'K grm' m'au' Avni tYi Rb' Ƶe' Ƶvqb c'Ƶuqv' e' envi |

17. evsj v' tki mvgv'K Rj mvgvq grm' Avni tYi Rb' c'ƵqvRbt

K. Ƶclwks j vBtmY
L. c'ƵqvRbxq mb' cT (thgb grm' tbshtvbi ti ƵRt'okb, B'YtcKkb mvmU'cltKU BZ'w')
M. RvZxqZv c'Ƶ k'ƵKvix cZvKv I Ƶ'w'ŵ'ŵ' cwi ƵPvZ ƵP'Y
N. mvgv'K grm' m'au' Avni YiZ c'ƵZ' tKi Rb' mvgv'K grm' ƵBi KZ' Rvi xKZ. cwi Pq
cT |

18. ƵPsw Uj vti i Rb' 30% m' vgvQ Avni Y I AeZi Y eva' Zvg j K |

19. grm' AeZi Yi U'vY' Ƶc' t' g' t' Ui mgq A_ i vBRW A'wclmvti i Dcw' wZ eva' Zvg j K |

20. Uj vti i Rb' c'ƵZ Ƶ'w'c Mg' tbi c' t' e' Ƶ' c' Ƶ' m' Bj s c' vi Ƶ' g' kb M' h' Y Ki v eva' Zvg j K |

21. ƵclRvi Uj vti i t' m' Bj s c' vi Ƶ' g' kb n' t' e' m' t' e' P' P 30 w' t' bi Ges bb ƵclRvi Uj vti i t' Ƶ' t' t' t' m' t' e' P' P 15 w' t' bi Rb' |

22. mvgv'K m' v' t' f' B' t' j Y t' P' K t' c' v' o' ev Ab' T Ae' v' b' i Z A_ i vBRW A'wclmvti i Ƶb' t' Ƶ' k' m' v' o' v' t' Ƶ' qv c'ƵZ' w' g' v' r' m' t' b' s' h' v' t' b' i Rb' eva' Zvg j K |

23. K. c'ƵZ' w' Uj vti t' g' w' i b Ƶclkw' i GKv' t' W' g' x t' Ƶ' K c' v' k' KZ. 3 Rb' t' K Ƶb' t' q' v' m' RZ Ki v eva' Zvg j K |

L. c'ƵZ' w' g' v' r' m' t' b' s' h' v' t' b' i (Uj vi e' Z' i Z) mi Kvi Ab' t' g' w' i Z t' g' w' i b Ƶclw' t' Rj ̄ ǵ KZ' R mb' c' Ƶ' B' GKRB' t' K Ƶb' t' q' v' m' RZ Ki v eva' Zvg j K |

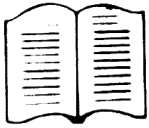
24. D³ Av' t' bi Ƶe' a' r' b' r' e' j xi j O' N' b' grm' ev' t' R' q' v' B' Ki Ymn kw' Ƶ' h' v' M' Ac' i va |

grm' msi ƵY Av' t' bi eZ' g' b Ae' v

evsj v' t' k' i grm' m' au' Avni Y mnbk' j ch' v' q' i v' L' vi Rb' A' t' b' K h' v' Ƶ' h' y' Av' Bb c' Ƶ' q' b Ki v n' t' q' t' q' | Ƶe' w' f' b' e' K' v' i' t' Y t' h' g' b- m' v' a' v' i' Y R' b' M' t' Y' i A' m' t' P' Z' b' Z' v' I A' A' Z' v' Ges Av' Bb c' Ƶ' q' v' M' K' v' i' x m' s' v' ev m' s' v' m' g' n' i m' x' g' v' e' x' Z' v' i K' v' i' t' Y h' v' h' f' v' t' e' G Av' Bb K' v' h' R' i n' t' q' b' r' | Z' e' y' G' m' e Av' Bb f' t' z' i K' v' i' t' Y c' Ƶ' Z' e' Q' i mi K' v' i KZ' R A' t' b' K g' v' g' j v' Ƶ' v' t' q' i Ki v n' t' q' | Av' g' v' t' i f' i' e' l' Z' c' R' t' b' i Rb' g' v' Q' m' i' e' i' v' n' m' P' j i v' L' t' Z' n' t' j h' t' M' v' c' t' h' v' M' x grm' Av' Bb c' Ƶ' q' b I c' Ƶ' q' v' M' Ac' i v' i n' v' h' Ƶ'

ƵclRvi Uj vti i t' m' Bj s c' vi Ƶ' g' kb n' t' e' m' t' e' P' P 30 w' t' bi Ges bb ƵclRvi Uj vti i t' Ƶ' t' t' t' m' t' e' P' P 15 w' t' bi Rb' |

Av' g' v' t' i f' i' e' l' Z' c' R' t' b' i Rb' g' v' Q' m' i' e' i' v' n' m' P' j i v' L' t' Z' n' t' j h' t' M' v' c' t' h' v' M' x grm' Av' Bb c' Ƶ' q' b I c' Ƶ' q' v' M' Ac' i v' i n' v' h' Ƶ'



mvigg evsj vř`ki grm" mřúř`i Dbřb I mřVK e`enřii Rb" hřMřcřhvMř grm" AvBb
 cřqb I ev`ėvqb Kiv Avek`K| mřřřI RbK nři grm" AvniY Kiv řbqggřdK grm"
 Drcv`b mřúřbřKiv, gvQřK řejřZvi nřZ ř_řK i řřv Kiv grm" AvBřbi DřřK`| G j řřB
 1950 mřřj cřg grm" mři řřY AvBb cřqb Kiv nq| G AvBřbi DřřLřhvM" `evkó` řřv
 nřřv 23 řm.řg. Gi řbřPi AvKřii i řř, KvZřv, gřřMj, Křřj evDm, Nřřbqv, Břřj k, cvřMřm I
 řřgI qřřv gvQ aiv, cřřenb Kiv I řřřř Kiv Ges 4-5 řm.řg. Gi řbřPi AvKřii dřřř Rřřj
 (Křřřřřř Rřřj) Gi e`enři řbřřřř

μgvs̄tq DRzntq hrt"Q Ges bZb f ug Mvb KitQ | Avevi cPž tgšmgn epócvZ ašsmvZK NwšSo, mvgv̄K tX D cFwZ KviŸY DcKj xq fLÜ mbqZ 9m̄qòž dtj Gt̄tki DcKj AZ"šl AnbqmgZ I A"lqx hv ZUti Lv ubaŸŸYi t9t̄Ÿ Rulj Zvi m̄pó KtiQ |

evsj vt`k Zvi fZwZK Ae`tk meŸePbr Kti `k d`v`g mgv̄m̄tgvb̄Z ti Lvtk wfiEti Lv inm̄te ŸNvl Yv Kti |

Dcwi D³ fZwZK KviŸY mgv̄ AvBb Kbtfbk̄bi m̄vaviY wfiE tiLv b̄m̄Zi tKvbwUB evsj vt`ki wfiE tiLv ubaŸŸYi t9t̄Ÿ c0hvR" bq | GRb" evsj vt`k Mfxi Zvi wfiE tZ wfiEti Lv ubaŸŸYi K_v etj | 1982 m̄tj i mgv̄ AvBb Kbtfbk̄bi Mfxi Zvi c×wZtK "Kvi Kiv ntj I tm m̄pótk̄m̄yúó e`vL`v t`qv nqub | Zte evsj vt`k Zvi fZwZK Ae`tk meŸePbr Kti `k d`v`g mgv̄m̄tgvb̄Z ti Lvtk wfiEti Lv inm̄te ŸNvl Yv Kti | G wfiEti Lv evsj vt`ki DcKj ntZ `vb tft` 16 ntZ 30 b̄wUK`vj gvBj AMfxi mgv̄`Aew`Z |

DcKj ti Lvtk hv` wfiEti Lv aiv ntZv Zte msj M̄eivómḡt̄ni m̄t_ evsj vt`ki G m̄p̄všl tKvb meŸivaB t`Lv w`Z br | tKbbv GtZ AvĀw̄j K mgv̄DcKtj i Ly mbKt̄UB Ae`vb KitZv | wKš' G Mfxi Zv c×wZtZ (evsj vt`ki fZwZK ev`bZvi KviŸY) wfiEti Lv ubaŸŸY Kivq wfiEti Lvi ga`eZrGK meivU mgv̄AĀj G t`tki Af`šli xy c̄vb m̄pó` etj meŸePZ ntZv Ges `fveZB AvĀw̄j K mgv̄Ÿ i `jZl DcKj t`tk AtbK `i chšŸe`Z. ntZv hv Gt̄tki f, ivRb̄m̄Zi Rb" GKwU m̄p̄eavRbK Ae`vb | G KviŸYB msj M̄eivó`mḡt̄ni m̄t_ wfiEti Lv m̄p̄všl G Rulj Zvi GKwU P̄e³ wfiEK mgv̄aib c0qvRb |

AvĀw̄j K mgv̄I msj M̄eAĀj

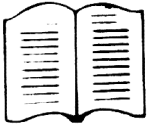
evsj vt`k wfiEti Lv ntZ 12 b̄wUK`vj gvBj AvĀw̄j K mgv̄b̄m̄Zi mg_Ÿ Ges 1974 m̄vj ntZB evsj vt`k G b̄m̄Z tḡb Pj tQ | mgv̄ AvBb Kbtfbk̄bi c0Z`K DcKj xq ivótk wfiEti Lv ntZ 24 b̄wUK`vj gvBj msj M̄eAĀj t̄fv̄M̄i AwaKvi c0vb Kiv nq | wKš' evsj vt`k AvĀw̄j K mgv̄ ntZ Zvi msj M̄eAĀj 6 b̄wUK`vj gvBj aŸi cvk Kti | GtZ wfiEti Lv ntZ msj M̄eAĀj i `i-Zj`v̄v̄q 18 b̄wUK`vj gvBj |

msiŸŸZ A_Ÿw̄ZK AĀj I gn̄tm̄cvb AĀj

c0Z`K DcKj xq ivt0f m̄vaviYZ 200 b̄wUK`vj gvBj chšŸmsiŸŸZ A_Ÿw̄ZK AĀj Ges 200 b̄wUK`vj gvBj gn̄tm̄cvb AĀj e`en̄v̄i i AwaKvi itqtQ | wKš' eŸŸv̄cm̄M̄t̄i fZwEjK ev`bZvi KviŸY evsj vt`ki ctŸŸ GKQŸ f̄te G AwaKvi t̄f̄M̄ Kiv m̄p̄e bq | evsj vt`ki msj M̄eivóŸq fvi Z I gvqvbgvi I hv` GKB m̄t_ 200 b̄wUK`vj gvBj msiŸŸZ A_Ÿw̄ZK AĀj Ges gn̄tm̄cvb `vex Kti Zte Ziv̄ i `vexKZ.AĀj evsj vt`ki `vexKZ.AĀj i Dci Q̄w̄ic̄tq hvq | gn̄tm̄cvb AĀj i w̄fv̄R̄t̄bi t9t̄ŸI c0q GKB aiŸYi Rulj Zvi m̄pó ntqtQ |

c0Z`K DcKj xq ivt0f m̄vaviYZ 200 b̄wUK`vj gvBj chšŸmsiŸŸZ A_Ÿw̄ZK AĀj Ges 200 b̄wUK`vj gvBj gn̄tm̄cvb AĀj e`en̄v̄i i AwaKvi itqtQ |

eŸŸv̄cm̄M̄t̄i tgvU AvqZb 879375 eM̄v̄Bj Ges Mo Mfxi Zv 2586 w̄gUvi | G m̄M̄t̄i gn̄x̄v̄tj i cwi mgw̄B Nt̄ŪtQ 3000 w̄gUvi Mfxi Zvq | mgv̄ AvBb Kbtfbk̄bi weavb AbŸv̄q̄x tKvb DcKj xq ivó wfiEti Lv ntZ m̄ŸP̄P 350 b̄wUK`vj gvBj A_ev 2500 w̄gUvi Mfij mgv̄ Zj t`k ntZ 100 b̄wUK`vj gvBj chšŸgn̄tm̄cvb t̄f̄M̄ Ki tZ cvi te | GLb evsj vt`k hv` G Mfxi Zv `i-Zj b̄m̄Z AbŸv̄q̄x mgv̄` Zvi gn̄v`k̄xq AĀj i tkl m̄xv ubaŸŸY Kti Zte Zv nqtZv ev eŸŸv̄cm̄M̄i Q̄w̄ic̄tq Av̄t̄iv `ŸŸŸY AM̄ñi nte | G KviŸY eŸŸv̄cm̄M̄t̄i Mfxi Zv `i-Zp̄w̄Z Acivci `ŸŸ i vt0f ctŸŸI M̄ñY Kiv m̄p̄e nte br |



mvi gg AvšR̄K̄ZK b`xi cwib b`x AeewwKvi ivómḡni m̄vavi Y m̄úw̄É| mgq AwZewwZ
 nI qvi m̄v_ m̄v_ c̄w_exi fL̄UMZ m̄ú` w̄bt̄kl n̄Z Pj̄t̄Q| ZivB m̄ḡw̄K m̄ú` ḡvb̄j̄ i
 Kiv̄Q AvKĪxq n̄q D̄v̄t̄Q| d̄tj c̄Z̄W̄ ivóB GLb mḡj̄ i Dci Zvi AwK̄v̄t̄i ēv̄c̄v̄t̄i
 AZ̄š̄l m̄PZb| mḡj̄ i wek̄ij Ḡj̄v̄K̄v̄t̄K mḡj̄ ZŪt̄iLv, Av̄Ā̄ij K mḡj̄ AĀ̄j, msj M̄em̄ḡj̄
 AĀ̄j, ms̄īw̄j̄Z A_̄w̄w̄ZK AĀ̄j, ḡn̄x̄m̄v̄c̄v̄b Ges Dbk̄j mḡj̄ AĀ̄j w̄n̄t̄m̄te w̄P̄v̄ȳZ Kiv
 n̄t̄q̄t̄Q| 1982 m̄v̄t̄j i mḡj̄ Av̄Bb K̄b̄t̄f̄b̄k̄b Ab̄j̄v̄q̄x̄ ZŪt̄iLv t̄_̄t̄K 12 b̄w̄UK̄`ij ḡv̄Bj ch̄š̄l
 Av̄Ā̄ij K mḡj̄ AĀ̄j, 24 b̄w̄UK̄`ij ḡv̄Bj ch̄š̄l msj M̄em̄ḡj̄ AĀ̄j Ges 200 b̄w̄UK̄`ij ḡv̄Bj
 ch̄š̄l ms̄īw̄j̄Z A_̄w̄w̄ZK AĀ̄j w̄b̄āf̄i Y Kiv n̄t̄q̄t̄Q|



c#VvĒi gj'iqb 10.2

m#K DĒti i c#k #K #Pý (✓) # b |

1/ ZUti Lv n#Z KZ b#K'ij gvBj chŠGj vK#K AvĀij K mgÿ#AĀj etj ?

- K) 14
- L) 12
- M) 16
- N) 20

2/ msi#Z A_#ZK AĀj ZUti Lv t_tK KZ`i-chŠ#e`Z?

- K) 100 b#K'ij gvBj
- L) 150 b#K'ij gvBj
- M) 200 b#K'ij gvBj
- N) 300 b#K'ij gvBj

3/ fZvĒK ev`éZvi Kvi tY wfiĒti Lv #ba#tY ersj v#ki c#ite #K #Qj ?

- K) 1 d'v`g mgÿ#m#gvb#Z ti Lv#K wfiĒ ti Lv aiv n#e
- L) 5 d'v`g mgÿ#m#gvb#Z ti Lv#K wfiĒ ti Lv aiv n#e
- M) 10 d'v`g mgÿ#m#gvb#Z ti Lv#K wfiĒ ti Lv aiv n#e
- N) 20 d'v`g mgÿ#m#gvb#Z ti Lv#K wfiĒ ti Lv aiv n#e

4/ et#vc#M#i i Mo Mf#i Zv tKv#U?

- K) 1525 #gUvi
- L) 2050 #gUvi
- M) 3165 #gUvi
- N) 2586 #gUvi



Povšgji`vqb

msi`B I iPbgj-K cke

- 1| grm` msi` Y AvBb c`q`bi D`I`k` , t`j v`ij L`y|
- 2| grm` msi` Y AvBb 1950 Gi AvI Zvq ewYZ wena mg`ni `enkó` ij L`y|
- 3| AvSRZK b`xi cmb e`enit`i i AvSRZK bwiZgvj v eY`v Ki`y|
- 4| DcKj`xq i vtó`i mg`m`xgv uba`f`Y Kivi bwiZgvj v eY`v Ki`y|
- 5| mg`Gj vKv`K KqW fv`M f`M Kiv n`q`Q Dnvt``i eY`v w`b|
- 6| ersj vt``ki mg`m`xgv uba`f`Yi mgm`vej`x eY`v Ki`y|



D`E`i`gvj`v

cW 10.1

- 1| L 2| K 3| M 4| N

cW 10.2

- 1| L 2| M 3| M 4| N