

জাতীয় শিক্ষাক্রম ২০১২

বিজ্ঞান

ষষ্ঠ-দশম শ্রেণি

পদার্থবিজ্ঞান

রসায়ন

জীববিজ্ঞান

নবম-দশম শ্রেণি



জাতীয় শিক্ষাক্রম ও পাঠ্যপুস্তক বোর্ড

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উন্নয়ন ও তত্ত্বাবধান



জাতীয় শিক্ষাক্রম ও পাঠ্যপুস্তক বোর্ড
৬৯-৭০ মতিঝিল বাণিজ্যিক এলাকা, ঢাকা ১০০০।

আর্থিক ও কারিগরি সহযোগিতা



সেক্টোরি এডুকেশন মেক্টর ডেভেলপমেন্ট প্রজেক্ট
মাধ্যমিক ও উচ্চশিক্ষা অধিদপ্তর, শিক্ষাভবন, ঢাকা ১০০০।

প্রকাশকাল
ডিসেম্বর ২০১২

মুদ্রণ : নাইদ এড. এন্ড প্রিন্টিং, ৯৯৩/৯৯৪ নয়াপল্টন, মতিঝিল, ঢাকা- ১০০০

জাতীয় শিক্ষাক্রম ২০১২

gLeÜ

„b e`tji A½xKvi ciY Ges 2021 mvtji gta` evsjv`kK GKU ga`g Avtqi t`k ciYZ Kivi cavb Dcvq `y Rbk³ ^Zi Kiv| kÿvi gva`g Zv mæ weavq miKvi gvbmaúb kÿv b½ðZ Kivi jtÿ` megn`ji bKU MnYthvM` GK hMvŠKvix kÿvb½Z cYqb Kti| RvZxq kÿvb½Z 2010 ev`evqþbi mevaK , izcY c`þyc nt`Q G kÿvb½Z Abmvþi t`tki kÿve`vi , YMZ cieZb mvab| G tciYþZ RvZxq kÿvmug I cW`c`K teWw cPijZ kÿvmug Dbqþbi Dþ`vM MnY Kti|

kÿvmug Dbqb GKU Pjgvb cµqv| ivoxq `kb I Av`k, B½Znm I ms`Z, mgKvjxb Rxeþbi Pvn`v, weÁvb I ch³ BZ`w` tÿþÎ Ávb I `yZv ARþbi avivewnkZv eRvq ivLþZ kÿvmug cigvRb I Dbqb Kti kÿv e`evq M½Z mÁvi KiþZ nq| gva`gK`þii cPijZ kÿvmug 1995 mvtj cYxZ nq| G `xN mgþq RvZxq Rxeþbi wefb tÿÎ Ges Ávb-weÁvþi RMþZ e`vcK cieZb mvaZ ntj I kÿvmug Dbqb bv nIqq Gi cZdjb Avgþ`i kÿv e`evq Avþm b| ZvB kÿvmug Dbqb mgþqi `ve|

RvZxq kÿvb½Z 2010 Gi f½ËZ kÿvmugi iþiLv cYqb Kiv nq| kÿvmug iþiLv PoiŠKiþYi jtÿ` t`tki c½Zhkv kÿwe`, e½xRex I Ab`vb DcKviþfvMþ`i mgþq GKU RvZxq Kgvjvi AvqvRb Kiv nq| G Kgvjvq cvß gZvgZ I mcwiþki AvþjvK Ges ctqvRbxq mstkvab mvtctÿ RvZxq kÿvmug mgþq KigU (Gbmmmm) KZK kÿvmug iþiLv Abtgw`Z nq| kÿvmugi Abtgw`Z iþiLv Abhvq kÿvmug Dbqb cµqv| wefb avc AbmiY Kti lô t`þK Aóg tkvYi 17U Ges beg I `kg tkvYi 27U elþqi kÿvmug Dbqb Kiv ntqþQ| kÿvmug Dbqþbi Rb` elqf½ËK KigU MvB Kiv nq| G mKj KigUþZ elq weþklÁ, kÿK c½kÿK, tkvYkÿK I kÿvmug weþklÁMY KvR KtiþQb|

mvaúbZK Kvþji AþbK , izcY elq I elqe`, thgb: Z` I thvMþhvM ch³, Kg I RxebgLv kÿv, K`wiqvi kÿv, Rjevq cieZb I Avgþ`i KiYxq, eqtm½ÜKvj I cRbb `v`, b½x Dbqb b½Zgvjv BZ`w` kÿvmug Ašf³ Kiv Kiv ntqþQ| cigvRZ kÿvmugi tPZbv gta` aviY Kiv ntqþQ gnvb g½hþxi tciYv, Av`k I gj`þeva| kLb-tkLþbv Kvþmug I avivewnk gj`vqþbi tÿþÎI cieZb Avbv ntqþQ| gL` Kivi cieþZ ÔKþi tkLwði Dci tRvi t`lqv ntqþQ| mRbkxjZv weKvþki c½kvwk kÿv_xþ`i b½ZK gj`þeva, mZZv, t`kþcg I tbZþZi , Yvej ARþbi Dci , izvþivc Kiv ntqþQ| mtevcwi G`þii kÿvþK Rxeþbi cþek Øvi wnmvþe weþPbv Kti KgRxeþb cþek ctqvRbxq thvM`Zv ARþbi DcþhvMx Kti kÿvmug Dbqþbi cqvm Pvjvþv ntqþQ|

tmþKÜwi GWþKkb tm±i tWþfjctgU ctR± kÿvmug Dbqþb Avw_K I KvwiMi mnþhvMZv c`vb Kivq cKí KZcÿþK ab`ev` Rvbw`Q| kÿvmug Dbqþb elqf½ËK kÿvmug Dbqb KigU QvovI Gbmmmm, ctþkbvj KigU, tUKwbK`vj KigU, t½Us KigU Ges mweK mgþq KigU b½jmfvþe KvR KtiþQb| G mKj KigUi mKj m`m`þK RvþB AvŠ½iK KZÁZv|

Avkv KivQ, DbqbKZ kÿvmug ev`evqþbi gva`g t`kK Ávb, weÁvb I ch³þZ `y, GKB mþ½ b½ZK gj`þeva, RbMþYi c½Z kxvkxj I `vqex Ges g½hþxi tPZbv DØ× GK bZb cRb½ Mþo DVþe| G bZb cRb½ t`tki Dbqb I AMM½Z ZvrchcY Ae`vb ivLþZ mÿg nte eþj Avkv KivQ|

ctdmi tgvþtgv`dv KvgvjD½b

tPqvig`vb

RvZxq kÿvmug I cW`c`K teWw, XvKv|

µg	¶elqe [−]	côn bai
1. gLeÜ		i
2. mPbv		1
3. ¶kyµg Dbq‡bi †hš¶ ³ KZv		1
4. ¶kyµg Dbq‡b AbmZ g‡Wj		2
5. ¶kyµg Dbq‡b AbmZ c¶Kqv		2
6. RvZxq ¶kyµg 2012 Gi ^eikó		7
7. ¶kyµg i c‡iLv		7
8. ¶kLb †kLv‡bv c×¶Z I †Kškj		10
9. ¶ky_v_x gj [¶] qb		15
10. ¶kyµg Dbq‡b ms¶kó K¶g¶U		19
11. ¶eÁvb ¶kyµg		25
12. c`v_¶eÁvb ¶kyµg		129
13. im¶qb ¶kyµg		165
14. Rxe¶eÁvb ¶kyµg		199

1. mPbv

1.1 h¹ wPZ cecwKÍb¹ cYqb Ges Gi mô ev⁻evq¹bi Dci w¹bf¹ K¹i th¹Kv¹bv Kv¹h¹u¹gi mdjZv¹ w¹k¹v Kv¹h¹u¹gi Gi¹c ce-cwKÍb¹B w¹k¹v¹u¹g¹ w¹k¹v¹_x¹ i Av¹Mn, ceYZ¹, mv¹g¹, Aw¹fÁZ¹ I w¹kLb Pw¹n¹ vi mv¹_ Ges mgv¹R, t¹k I Av¹ŠRw¹ZK c¹i¹ w¹Z w¹etePbv¹ t¹i¹L cYx¹Z nq w¹b¹ó w¹k¹v¹u¹g¹ t¹K, t¹Kb, Kx, w¹Kf¹ve, Kvi mn¹th¹w¹MZv¹q, Kx w¹q, t¹Kv¹_vq, KZ mgq a¹i w¹kL¹te Ges hv¹ w¹kLj w¹Kf¹ve Zv hv¹PvB Kiv hv¹de Gme c¹ki DĖi w¹k¹v¹u¹g¹ _v¹K¹ w¹k¹v¹i j¹“, D¹Ėk“, w¹kLbdj, w¹elqe⁻, w¹kLb-t¹kL¹v¹bv Kv¹h¹u¹g I gj¹_vq¹ w¹b¹q¹kbv-GmeB w¹k¹v¹u¹gi c¹w¹Zc¹ w¹elq¹ w¹k¹v¹u¹gi w¹f¹Ė¹Ė¹ZB cYx¹Z nq c¹w¹c¹K I Ab¹vb¹ w¹kLb-t¹kL¹v¹bv mv¹g¹Mx Ges c¹iPw¹jZ nq w¹kLb-t¹kL¹v¹bv Kv¹h¹u¹g¹ Gme cYq¹bi w¹b¹q¹kbv¹ _v¹K¹ w¹k¹v¹u¹g¹ w¹k¹v¹u¹g¹K w¹k¹v¹ Kv¹h¹u¹g ev⁻evq¹bi bxj-bKkv ejv n¹q¹ _v¹K¹

1.2 w¹k¹v¹u¹g GK¹U Pjg¹vb c¹u¹q¹ G c¹u¹q¹q av¹ew¹nK c¹u¹ex¹Ų¹Yi gva¹g Pjg¹vb w¹k¹v¹u¹gi mejZv⁻ ejZv¹ I Dc¹th¹w¹MZv¹ w¹bYq Kiv nq¹ mg¹qi mv¹_ mgv¹Ri c¹u¹ieZb NU¹Q, Zv¹Q¹ov Av¹b-w¹ĖÁv¹ I ch¹ i¹ z¹C c¹u¹ieZb n¹Q¹ Gm¹ei d¹j w¹kLb Pw¹n¹ v¹ I c¹u¹ieZZ n¹Q¹ G Rb¹ c¹q¹Rbx¹q c¹u¹ig¹Rb I bev¹q¹bi gva¹g w¹k¹v¹u¹g h¹M¹vc¹th¹Mx iv¹Lv Ave¹k¹K¹ Ave¹i Ggb mgq Av¹tm hLb c¹i¹v¹bv w¹k¹v¹u¹g c¹u¹ig¹Rb K¹i mg¹qi Pw¹n¹ v¹ ciY m¹ae nq bv, ZLb bZb w¹k¹v¹u¹g cYqb Ki¹z nq¹ RvZxq w¹k¹v¹u¹g ev⁻evq¹bi Rb¹ I bZb w¹k¹v¹u¹g Dbqb Ki¹z nq¹ G c¹u¹i¹c¹Ų¹z RvZxq w¹k¹v¹u¹g 2012 cYq¹bi c¹Ų¹c MnY Kiv n¹q¹Q¹

2. w¹k¹v¹u¹g Dbq¹bi th¹š¹ KZv

2.1 gva¹gK¹ Ų¹ii eZg¹vb w¹k¹v¹u¹g 1995 mv¹j cYx¹Z¹ Gici¹ x¹N mg¹q RvZxq I Av¹ŠRw¹ZK c¹u¹ig¹Ė¹j mv¹g¹RK, m¹is¹-w¹ZK, A¹_b¹zK I iv¹R¹b¹zK w¹efb t¹Ų¹Ė¹ w¹ek¹l K¹i Áv¹-w¹ĖÁv¹, Z¹ I th¹w¹M¹th¹M ch¹ i¹ t¹Ų¹Ė¹ e¹vcK c¹u¹ieZb N¹u¹Q¹ c¹u¹ieZ¹bi mv¹_ mv¹_ w¹k¹v¹_x¹ i¹ w¹kLb-Pw¹n¹ v¹ z¹C c¹u¹ieZZ n¹Q¹ G Pw¹n¹ v¹bh¹q¹ w¹k¹v¹u¹g h¹M¹vc¹th¹Mx Kivi Rb¹ w¹k¹v¹u¹g Dbqb Ac¹iv¹h n¹q¹ w¹o¹q¹Q¹

2.2 gva¹gK¹ Ų¹ii cP¹jZ w¹k¹v¹u¹gi Dci Ų¹gva¹gK¹ Ų¹ii w¹k¹v¹u¹g gj¹_vq¹ I Pw¹n¹ v¹ w¹b¹i¹c¹Ų¹ k¹IK c¹iPw¹jZ M¹elYvi djvd¹j w¹k¹v¹u¹gi A¹tbK¹ ejZv¹, Am¹z¹ I mgm¹v w¹P¹Ų¹Z n¹q¹Q¹ G w¹k¹v¹u¹g Av¹Zg¹v¹q ZĖ I Z¹ m¹sejZv¹ hv

w¹k¹v¹_x¹K gL⁻ Ki¹z Drm¹w¹nZ K¹i¹ cP¹jZ w¹k¹v¹u¹g Abm¹Üvb, mgm¹v mgv¹av¹bi th¹w¹M¹Zv ARb, nv¹z-Kj¹g KvR K¹i¹ t¹kLvi Ges mRb¹k¹xj I D¹veb¹ Ų¹gZv w¹ek¹v¹ki m¹th¹M mx¹gZ¹ w¹k¹v¹_x¹ i¹ b¹zK I g¹vb¹ek¹ , Yve¹ji w¹ek¹v¹ki m¹th¹Ml Kg¹ c¹q¹Rbx¹q w¹elq Ges w¹elqe⁻ thgb- Z¹ I th¹w¹M¹th¹M ch¹ i¹ , Rjev¹qi c¹u¹ieZb I KiYxq, eqtm¹ÜK¹vj I cRbb⁻ v⁻, Rvjw¹b w¹bivc¹Ėv BZ¹ w¹i¹ c¹u¹Zdj¹b LeB mx¹gZ¹ Zv¹Q¹ov gvZfvlv evsjv Ges Av¹ŠRw¹ZK fvlv B¹š¹i¹w¹R w¹kLb-t¹kL¹v¹bv i¹ t¹Ų¹Ė¹ t¹kvbv, ejv, cov, t¹jLv Gme⁻ Ų¹Zv w¹kL¹bi Rb¹ w¹k¹v¹u¹g , i¹zC⁻ v⁻ Kiv n¹j¹ I ev⁻evq¹bi G¹, j¹v h¹_vh¹ , i¹z c¹vq w¹b¹ w¹k¹v¹_x¹ i¹ K KggLx Kivi t¹Ų¹Ė¹ w¹k¹v¹u¹gi Ae⁻ v⁻ m¹š¹lRbK bq¹ bevq¹bKZ w¹k¹v¹u¹gi Gme mx¹g¹ex¹Zv K¹u¹U¹q DV¹i c¹P¹óv t¹blq¹ n¹q¹Q¹

2.3 RvZxq w¹k¹v¹u¹g 2010 evsjv⁻ t¹ki w¹k¹v¹Ų¹Ė¹ GK¹U gvBjdjK¹ RvZxq w¹k¹v¹u¹g 2010 Abm¹vi w¹k¹v¹i gva¹g h¹M¹vc¹th¹Mx Rb¹k¹ i¹ Dbq¹bi Rb¹ c¹q¹Rb w¹k¹v¹u¹gi Dbqb Ges Gi h¹_vh¹ ev⁻evq¹bi RvZxq w¹k¹v¹u¹g 2010 Gi ev⁻evq¹bi mewa¹ , i¹zCy¹ c¹Ų¹c n¹Q¹ G w¹k¹v¹u¹g Abm¹vi w¹k¹v¹e⁻ v⁻ i¹ ceZb Ges Gi Rb¹ c¹q¹Rb t¹m Abm¹vi w¹k¹v¹u¹g Dbqb¹

2.4 evsjv⁻ t¹ki i¹cK¹i 2021 Gi j¹Ų¹ n¹Q¹ w¹W¹RUv¹ evsjv⁻ t¹k M¹to t¹Zvjv Ges t¹k¹K ga¹g Av¹qi t¹k c¹u¹YZ Kiv¹ w¹W¹RUv¹ evsjv⁻ t¹k Mov Ges ga¹g Av¹qi t¹k c¹u¹YZ Kivi cavb Dcvq n¹Q¹ w¹k¹v¹i gva¹g h¹_vch¹ i¹ Rb¹k¹ i¹ m¹o¹ Kiv¹ Av¹ w¹k¹v¹i gva¹g Zv Kivi Rb¹ c¹q¹Rb Dc¹th¹Mx w¹k¹v¹u¹g¹

2.5 GKiesk kZv¹xi w¹k¹v¹i Rb¹ M¹vZ Av¹ŠRw¹ZK w¹k¹v¹ K¹igkb w¹i¹c¹U ‘Learning: The Treasure Within’ G gva¹gK¹ w¹k¹v¹Ų¹K R¹xe¹ b¹ c¹te¹k¹Ų¹i ‘gateway to life’ w¹nm¹ve w¹P¹Ų¹Z Kiv n¹q¹Q¹ Gi A¹_ KgR¹xe¹ b¹ c¹te¹k¹ c¹q¹Rbx¹q th¹w¹M¹Zv gva¹gK¹ w¹k¹v¹i gva¹g ARb¹ G th¹w¹M¹Zv AR¹bi Rb¹ c¹u¹z¹te¹ b¹ w¹k¹v¹i P¹vi¹U¹ w¹ P¹Ų¹Z Kiv n¹q¹Q¹ w¹amgn n¹Q¹-Rv¹bi Rb¹ t¹kLv, KvR Kivi Rb¹ t¹kLv, w¹g¹j¹g¹k¹ _v¹Kvi Rb¹ t¹kLv Ges w¹ek¹ikZ n¹lqv¹i Rb¹ t¹kLv¹ Gme⁻ a⁻ ev⁻evq¹bi gva¹g GKiesk kZv¹xi Dc¹th¹Mx Rb¹k¹ i¹ m¹o¹ Rb¹ c¹q¹Rb t¹m Abm¹vi w¹k¹v¹u¹g Dbqb¹

4.1 Ae⁻vi we⁺kiY

4.1.1 gva⁻igK ⁻ti i cPiJZ ik⁺vμg chv⁺jvPbv

GmBGmWwici ik⁺vμg we⁺klÁe⁻ 2008 mv⁺j gva⁻igK ⁻ti i (bg-gva⁻igK I gva⁻igK) ik⁺vμg chv⁺jvPbv K⁺ib| th⁺š³K chv⁺jvPbv gva⁻igK ik⁺vμgi í⁺uU-weP⁻WZ Ges ik⁺v₋x⁺ti i kLb Pw⁻n⁻v ci⁺tY ik⁺vμgi Dc⁺thwMZ⁻ hvPvB Kiv nq| GB chv⁺jvPbv i djvdj bZb ik⁺vμg Dbq⁺b we⁺ePbvq ivLv nq|

4.1.2 cPiJZ ik⁺vμgi gj⁻vqb

GmBGmWwici ik⁺vμg we⁺klÁMY ógva⁻igK ⁻ti i ik⁺vμg gj⁻vqb I Pw⁻n⁻v wbi⁺cY mgr⁺qv 2010⁰ kxIK GKU M⁺teIY⁻ cwiPvjv K⁺ib| G mgr⁺vi gva⁻igK ik⁺vμgi mej I ⁻ej ⁻K, ev⁻evq⁺bi cZeÜKZ⁻ I cwigR⁺bi t⁺qímg⁻n Pw⁻YZ Ges ik⁺v₋x⁺ti i kLb-Pw⁻n⁻v wbi⁺cY Kiv nq|

4.1.3 RvZxq ik⁺vμbWZ 2010

RvZxq ik⁺vμbWZ 2010-G D⁺jLZ ik⁺v ms⁺μvš bWZmgn we⁺kl K⁺ti gva⁻igK ik⁺v m⁺óuKZ avimgn chv⁺jvPbv K⁺ti bZb ik⁺vμg Dbq⁺bi w⁺fZ ⁻Zi Kiv nq| ik⁺vμbWZi w⁺fiÉ⁺ZB cPiJZ mKj avivi (m⁺vaiY, g⁺v⁻vmv, B⁺tiwR) ik⁺v⁺tK w⁺b⁻ó chv⁺q chš mgišZ I GKgLx ik⁺vμgi AvIZvq Ašf³ Kivi c⁻t⁺q⁺c tbiqv nq| G e⁻e⁻vq me ai⁺bi ik⁺v c⁺Zó⁺b c⁺g t⁺tiK Aóg tk⁺Y chš GKB ik⁺vμg Abm⁺ti i ik⁺v Kv⁺μg cwiPw⁻jZ n⁺te|

4.1.4 AvšRwZK chv⁺qi ik⁺vμg chv⁺jvPbv

mgmvgiqK we⁺ki w⁺be⁻wPZ K⁺qK⁺U t⁻ti- fviZ, kxj⁺W, gv⁺j⁺q⁺kqv, w⁺m⁺zi, A⁺ti⁻ijqv (A⁺ti⁻vR⁻), h³ivR⁻ (A⁺ti⁻vR⁻) Ges KivW⁺vi (A⁺ti⁻vR⁻) ik⁺vμg chv⁺jvPbv Kiv nq| Gme t⁻ti i ik⁺v⁻e⁻vi we⁺kl K⁺ti ik⁺vμgi we⁺kl w⁺Kmgn chv⁺jvPbv K⁺ti evs⁺jv⁻ti cwi⁻wZ⁺ G⁺ti i Dc⁺thwMZ⁻ hvPvB Kiv nq|

4.1.5 cwm⁺zK c⁺Z⁻e⁻b, ceÜ I gZvgZ chv⁺jvPbv

t⁻ti-⁻we⁺ti⁻ck cK⁺wKZ ik⁺v m⁺óuKZ we⁺kl K⁺ti ik⁺vμg we⁺lqK c⁺Z⁻e⁻b, ceÜ I gZvgZ chv⁺jvPbv Kiv nq| G⁺ti⁻ji g⁺ti⁻ D⁺jL⁺thvM⁻ K⁺qK⁺U n⁺ti⁻Q- GKiesk kZv⁺xi ik⁺v m⁺óuKZ AvšRwZK ik⁺v K⁺qk⁺bi c⁺Z⁻e⁻b UNESCO (1996) ÓLearning: The Treasure Within; O'Neill, Geraldine (2010) 'Programme Design: Overview of Curriculum Models'; Marsh, C.J (1997) 'Perspective Key Concepts for Understanding Curriculum'; Sheehan, John

(1986) Curriculum Models: Product versus Process, Smith, P.L (1993) Instructional Design, Macmillan; RvZxq ik⁺vμg I c⁺V⁻c⁻K teW cwiPw⁻jZ (2012) wbggva⁻igK, gva⁻igK I D⁺Pgva⁻igK chv⁺qi ik⁺vμg, ik⁺vK c⁺wK⁺Y ik⁺vμg I c⁺V⁻c⁻K tRÜvi m⁺te⁻bkxjZ⁻ chv⁺jvPbv kxIK c⁺Z⁻e⁻b, Rjevq c⁺wieZb I ⁻thvM, ZvgvK w⁺bqšY, UNICEF (2009) cwiPw⁻jZ ÓR⁺eb ⁻q⁺Zw⁺f⁺ÉK ik⁺v⁺ó|

ZvQov evs⁺jv⁻ti we⁺fb cKí, miK⁺wi I temiK⁺wi c⁺Zó⁺b Ges m⁺v⁻ ik⁺vμgi Ašf³ i R⁺b⁻ 31⁺U c⁺Z⁻e⁻b Rgv t⁻q| Gme c⁺Z⁻e⁻b chv⁺jvPbv K⁺ti m⁺sió⁺ we⁺l⁺q c⁺q⁺Rb⁺q c⁺wi⁺zK we⁺lq⁻ m⁺thvR⁺bi e⁻e⁻v tbiqv nq| 31⁺U c⁺Z⁻e⁻bi g⁺ti⁻ D⁺jL⁺thvM⁻ K⁺qK⁺U n⁺ti⁻Q- Rjevq c⁺wieZb, Z⁻ c⁺wi⁺Bi AwaK⁺vi, Lv⁻-c⁺ó, cRbb ⁻v⁻, GBPA⁺B⁺f-GBWm, we⁺kl Pw⁻n⁻v⁺m⁺óú⁺ w⁺k⁺i BZ⁻w⁻|

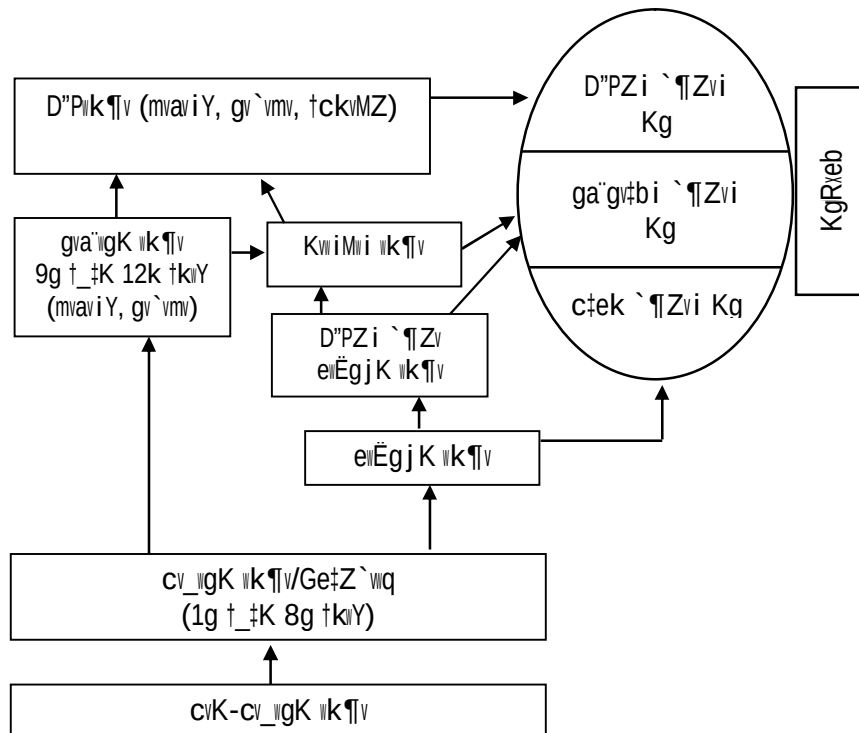
4.2 ik⁺vμgi i⁺c⁺tiLv cYqb

Ae⁻vi we⁺kiY t⁻tiK jä Av⁺fÁZ⁻ I djvd⁺ti i w⁺fiÉ⁺Z GmBGmWwici ik⁺vμg we⁺klÁe⁻ RvZxq c⁺vgk⁺ti w⁺b⁻ti⁻kbv⁺q ik⁺vμg Dbq⁺bi bWZgvjv Ges we⁺fb chv⁺qi ik⁺v Kv⁺μg m⁺g⁺všK⁺vi⁻ti i ik⁺vq AMm⁺Y ce⁻n w⁺Pí w⁺baviY K⁺ib| Gm⁺tei Dci w⁺f⁺É K⁺ti ik⁺vμgi i⁺c⁺tiLv cYqb Kiv nq|

4.2.1 ik⁺vμg Dbq⁺bi bWZgvjv

- gnvb fvlv Av⁺ti⁻vjb I g⁺ti⁻h⁺ti⁻x⁺i tPZbv Ges Am⁺v⁺c⁻w⁺qK gj⁻te⁺v⁺ai w⁺fiÉ⁺Z t⁻ti⁻cg we⁺K⁺ti m⁺thvM m⁺ó
- ⁻ti⁻zKZ⁻ I g⁺ti⁻we⁺K gj⁻te⁺va we⁺K⁺ti Dci , i⁺z c⁻vb
- Abm⁺Ürmv, mRbkj I D⁺w⁺ebx q⁺gZv e⁺x⁺i m⁺thvM c⁻vb
- we⁺Ávbg⁻ I KggLx Kivi Dci , i⁺z Av⁺ivc
- Awa⁺bK ch⁺3 e⁻en⁺ti i thvM⁻Zv AR⁺bi m⁺thvM m⁺ó
- Zw⁺ÉK Áv⁺bi mv⁺ ev⁻egLx I c⁺q⁺MgLx ik⁺v⁺i m⁺thvM e⁺x
- R⁺eb⁻q⁺Zv AR⁺bi m⁺thvM m⁺ó
- me ai⁺ti ⁻elg⁻ Aem⁺ti j⁺ti⁻ g⁺ti⁻we⁺waK⁺ti i Dci , i⁺z c⁻vb
- we⁺qv⁺bi Pw⁻n⁻v Abm⁺ti g⁺ti⁻we⁺ma⁺ m⁺ó i Dci , i⁺z c⁻vb

4.2.2 «კლვ კვჲუგ მგვზკვიჰ`ი AMmIY cevn «PÎ



RvZxq «კლვbmZ 2010 Gi wfE#Z Av#Z AMmIY cevn «PÎbmv#i 8eQi #gq#` eva`ZvgjK I A#eZwbK cv_gK «კლვ #kI K#i #gav I ceYZvi wfE#Z «კლვ_x#`i GK#U Ask Pvi eQi #gq#` gva'gK «კლვq Ges Ab` Ask#U eEg jK «კლვq c#ek Ki#e| gva'gK «კლვ #kI Zviv D'P «კლვq hv#e| Z#e gva'gK chv#qi c\_g `#eQi #kI #KD #KD KwiMwi «კლვq hv#e| eEg jK «კლვ mgvZkvix`i GK#U Ask c#ek `qZvi KgR#eb c#ek Ki#e, Ab`iv D'PZi `qZvi eEg jK «კლვ MnY Ki#e| GB «კლვ #kI #KQ msL`K «k#v\_x KwiMwi «კლვq hv#e Ges Ab`iv ga'gv#bi `qZvi KgR#eb c#ek Ki#e| KwiMwi «კლვ #kI #KD #KD D'P «კლვq (c#K#k) hv#e, #KDev ga'gv#bi `qZvi Kg R#eb c#ek Ki#e| D'PiklV #kI D'PZi `qZvi KgR#eb c#ek Ki#e| Gfv#e w#fb #vb I `qZv #b#q Zviv KgR#eb #i# Ki#e|

4.2.3 «კლვჲუგ Dbq#bi wbmiz bmZgvjv I «კლვ კვჲუგ მგვზკვიჰ`ი «კლვq AMmIY «PÎK m#uq wetePbvq #i#L «კლვჲუგ Lmov #c#iLv cYqb Kiv nq| Lmov #c#iLwU RvZxq «კლვჲუგ c#vgK I «კლვჲუგ w#kI#M#Yi tek Kq#U Af`#ixY mfvq chv#jvPbv I c#igvRb Kiv nq| Gfv#e c#igwRZ #c#iLv `#wU RvZxq #m#gbv#i (25 AvM÷ 2010 Ges 23 #deqwi 2011) Dc`vcb I chv#jvPbv Kiv nq| Gme #m#gbv#i RvZxq chv#qi «კლვჲუგ w#kI#A, w#lq w#kI#A, «კლვwe`, «კლვK-«კლვq w#kI#A, «კლვ ckmK, #kIY#k#K AskMnY K#ib| G #m#gbv#i gnvb RvZxq msm#`i K#qKRb gvbbxq msm` m`m` I RvZxq chv#qi tek K#qKRb #bZe` m#uq AskMnY K#i gZvgZ c`vb K#ib| #m#gbv#i #\_#K cv# mcw#k wetePbvq #i#L #c#iLwU c#igvRb Kiv nq| c#igwRZ #c#iLwU RvZxq «კლვჲუგ I cW`c`K teW Ges RvZxq «კლვჲუგ mg#q K#U KZK Ab#gw`Z nq| («კლვჲუგ #c#iLv 6b#i Ab#`Q#` m#thwRZ)

4.2.4 «კლვჲუგ #c#iLvq A#f³ w#lqmgn n#`Q «კლვი j#` I mvaviY D#`K, `i#f#EK wbevPZ w#lq, w#lq#f#EK b#i I mv#wnK w#liqW msL`v, «k#v#e#Ii Kg#em I Q#Ui ZwjKv, w#liq#Wi e`w#b, RvZxq w`emmg#n KiYxq BZ`w`|

4.3 **«elqif»ĖK «k»vμg Dbqb**

«k»vμgi i/ciLvi «f»ĖZ ciZiU «el»qi «k»vμg Dbqbi Rb" RvZxq chvqi «k»v «e»klĀ, «el»q «e»klĀ, AifĀ tkiYik»K I GbmU«e»Z KgiZ «e»klĀM#Yi mgšq ciZiU «el»qi Rb" 5 t_K 8 m`m` «e»kó GKU Kti KigiU «k»v gšYvj KZK MvB Kiv nq| ciZiU «el»q KigiU#Z mgšqKiv «nmv»e `wqZ cvjb Ktib GmBGmWci GKRb «k»vμg «e»klĀ|

4.3.1 «elqif»ĖK «k»vμg Dbqb KigiUmgn#K «Zb»U `tj fVM Kti ciZ `j#K «k»vμg Dbqb «el»q «b»eo cik»Y t`lqv nq| cik»Yi cavb «Zb»U t»Ĥ n#Q (K) «k»vμgi i/ciLv ci«P»Z I «k»vμg Dbqbi b»Zg»jv (L) «k»vμg Dbqb ciμqv Ges «k»vμg Dbqbi «b»wiZ QK I Gi e`envi (M) QKif»ĖK n#Z Kjtg bgbv «k»vμg Dbqb Ges chv»Pbv|

4.3.2 cik»Y ci`U«i»K Avjvc-Av»Pbv gva`tg «elqif»ĖK «k»vμg Dbqb «bg»jLZ tmcvb Abmi#Yi «m»vš tbiqv nq| (K) f»gKv («el»qi m»ĤB ciPq) (L) D#Ĥk" (m»aviY D#Ĥk`ve»ji Av»j#K «el»qi D#Ĥk`ve»j) (M) c»šK «kLbdj («elqif»ĖK D#Ĥk`ve»j ARb Dc#hMx «b»wiZ i tki ARb#hM" «kLbdj|) QK-1 G c»šK «kLbdj i tkiYif»ĖK «efv»Rb Ges QK-2 G tkiYif»ĖK «kLbdj, Aa`vq I «ci»qW mSL`v, Aa`vqif»ĖK «elq»e, «kLb-tkLv#b» «b#`kbv, gj`vqb «b#`kbv I cv`c`K cYqb «b#`kbv| t#nZ beg-`kg tkiY I GKv`k-Øv`k tkiY A«e»Q` tkiY, t#nZ G `ØU chvqi «k»vμg Dbqb QK-1 G tkiYif»ĖK «kLbdj «efv»Rbi c#qRb nq|b|

4.3.3 ciZiU «elqif»ĖK KigiU «`be`vcx «b»wiZ mSL`K mfvq «g»jZ nq «b»wiZ Q#K «k»vμgi Lmov cYqb Ktib| Gici GKB ai#bi «elq.»Qi «elqif»ĖK KigiUmgn I «k»vμg c»gk#Ki thš\_ mfvq Lmov «k»vμg Dc`vcb I chv»Pbv Kiv nq| «el»q KigiU tm Abm#i «k»vμg ci»gRb Ktib|

4.3.4 GKB ai#bi «elq»mgn «b#q PviU `j MvB Kti ciZiU `tji Ave»mK Kgkvjv Kigjv e#W (BARD) AbiØZ nq| «el»q KigiUi m`m`e`, m»kó tfiUs KigiU I m»úv`bv KigiUi m`m`e`, «k»v gšYvj KZK MvZ «k»vμg Dbqb «el»q tUKibK`vj KigiUi m`m`e` G Kgkvjv AskMnY Ktib| G Kgkvjv

«elqif»ĖK «k»vμg Dc`vcb I chv»Pbv Kiv nq| chv»Pbv Av»j#K m»ikó KigiU «k»vμgi c#qRb»q ci»gRb Ktib|

4.3.5 cieZ#Z mKj «k»vμgi Rb" m»aviY Ask `Zi Kiv nq| G AskU c#e c`ZKZ «k»vμgi i/ciLv I «elqif»ĖK «k»vμgmgni mv_ mgšq Kti cY#2 i/c`vb Kiv nq|

4.3.6 Gici cYxZ «k»vμg «efv»Mx Kgkvjv Dc`vcb I chv»Pbv Kiv nq| Kgkvjv «elq-«k»KMY `jMZfv#e _ _ «el»qi «k»vμg «b»eof#e chv»Pbv Kti m»b`ó mcwik ivLb| Kgkvjv G mcwi#ki Av»j#K «el»q KigiU «k»vμg ci»gRb Kti m»eK i/c`vb Ktib|

4.3.7 m»eK «k»vμgiU tUKibK`vj KigiU KZK ci»gRbi ci «k»v gšYvj KZK MvZ c#dkbv KigiU I RvZxq «k»vμg I cv`c`K t»W KZK Ab#g`Z nq| m»k#I RvZxq «k»vμg mgšq KigiU KZK Ab#g`b j#fi ci «k»vμgiU ØRvZxq **«k»vμg 2012** «nmv»e MnxZ nq|

chvq	Kvhµg	Dqbq/cYqbKvixe`
1. Ae`vi we#kIY	1.1 gva`igK `#i i cPi jZ #k¶vµg chv#jvPbv 1.2 gva`igK `#i i #k¶vµg gj`vqb I Pwn`v #bijcY mgx¶v 2010 cwiPvjbv 1.3 RvZxq #k¶vµg 1995-96 we#kIY 1.4 AvŠRvZK chv#qi #k¶vµg chv#jvPbv 1.5 cvmi½K cwiZte`b, ceÜ I gZvgZ chv#jvPbv	1.1 GmBGmWwici #k¶vµg we#kIÁe` 1.2 GmBGmWwici #k¶vµg we#kIÁe` 1.3 GmBGmWwici #k¶vµg we#kIÁe` 1.4 GmBGmWwici #k¶vµg we#kIÁe` Ges RvZxq #k¶vµg civgkK 1.5 GmBGmWwici #k¶vµg we#kIÁe` Ges RvZxq #k¶vµg civgkK
2. #k¶vµ#gi i#c#iLv cYqb	2.1 #k¶vµg Dqb#bi bxwZgvjv #baviY 2.2 #k¶v Kvhµg mgrvBKvix#`i AMmiY cevn wPÎ cYqb 2.3 #k¶vµ#gi i#c#iLv cYqb	2.1 #k¶vµg civgk#Ki wb#`kbvq GmBGmWwici #k¶vµg we#kIÁe` 2.2 #k¶vµg civgk#Ki wb#`kbvq GmBGmWwici #k¶vµg we#kIÁe` 2.3.1 #k¶vµg civgk#Ki wb#`kbvq GmBGmWwici #k¶vµg we#kIÁe` 2.3.2 `ÜU RvZxq tmgv#i AskMnYKvixe`

RvZxq 1kÿµg 2012

5. RvZxq ikvµg 2012 Gi ^ekó

- 5.1 mvaYy, gv`vmv I Bst`R ikvµvavimn mKj avivi ikvµvi Rb` Aóg tkY chS GKgLx I Aifb ikvµg cYqb|
- 5.2 Z_ I thvM`thvM ch`³, Kg I RxbgLx ikvµv Ges K`wiqvi ikýv msthvR`bi cKvcmk cPijZ mvgmRK AeÁvb iel`qi cietZ eisjv`k I iekcuiPq ielq msthvRb|
- 5.3 Rjevq crieZb, cRbb `v`, Z_ AaKvi, AURg BZ`v` ielqe` msthvRb|
- 5.4 6ô t`HK 10g tkvYtZ Hl`QK ielq inmvte Ôq` b`Môxi fvlv I ms`Zi ielq msthvRb|
- 5.5 h`Mi Pw`vbmvi mKj `ii cPijZ ielq`i ielqe` AaibKvqb Ges GKv`k-Øv`k tkvYtZ Hl`QK ielq inmvte U`iRg GÜ nmvcUv`jU bZb ielq msthvRb|
- 5.6 ag ikvµvnm mKj ielq`b`iZK ikvµvi Dci , iZ c`vb|
- 5.7 fvlv Av`vjv I g`h`xi tPZbv Ges Amoc`vqK tPZbv iekv`ki gva`g t`kiz`era I RvZq HK` iekv`ki Dci , iZ c`vb| t`kiz`era iekv`ki gva`g AvSR`mZKZ`era mói cqvm|
- 5.8 AeÁvbg`v, h`³ev`x, KggLx I `q Rbki³ mói Dci , iZ Av`ivc|
- 5.9 gvZfvlv eisjv Ges AvSR`mZK fvlv Bst`R ikvµv ielqe` gL` Kivi cietZ tkvbn, ejv, cov I t`jLv G PviU `qZv tkvYK`y Abkxj`bi gva`g tkLv i mthvM mói Ges AvRZ `yZv gj`vq`bi c`vZ ceZb|
- 5.10 iKlb-tkLv`bv tKSk`ji gva`g ikýv\_x`i`iK mRbkxj Kiv A\_vr ieklYgJK, PŠv D`xcK I mRbkxj c`kviEi I KvR Abkxj`bi gva`g mRbkxj I D`mvebx qgZvi iekv`ki mthvM c`vb|
- 5.11 thme ielq e`enwiK KvR Av`Q thgb- AeÁvb, c`v`AeÁvb, imvqb, RxeAeÁvb, K`ikvµv, Mv`v`AeÁvb, kvixiK ikýv I `v`, Kg I RxbgLx ikýv, Z\_ I thvM`thvM ch`<sup>3</sup>, PviZ I KvizKjv iel`qi Z`v`EK I e`enwiK As`ki gta` mgšq mvab Ges ikvµv`K Rxb I ev`egLx Kivi cqvm| A\_vr ciZiU ZÉ, mÎ I b`mZ ikvµvi mv`\_ mv`_ e`enwiK Kivi mthvM c`vb|
- 5.12 nvZ Kj`g K`i tkLv I `jMZ Av`jvPbv K`i tkLv Dci , iZ c`vb|
- 5.13 tkvY Kvµt`g ch`³ i e`envi ev`x|
- 5.14 ikvµv`K Rxb I ev`egLx Kivi cqvm Ges t`kxq tcv`vU Dbqb`y Rbki<sup>3</sup> mói Dci , iZ c`vb|
- 5.15 Aa`vq t`HK Kx Kx Ávb, `qZv, gj``era I `vófi` ARB Ki`e Zv ev`eiEK, g`bv`cikR I Av`eMxq iKlbdj inmvte ciZiU Aa`vqi `i`iZ msthvRb|

- 5.16 ikvµvi gva`g meckvi `elg` `i K`i mgZv iea`bi mthvM mói| ij`<sup>2</sup>, ag, eY, RvZ, tckvMZ I A\_`b`iZK `elg` `i Kivi j`q` GKxfZ ikvµv , iZ c`vb|
- 5.17 iekv`bi Pw`v Abmv`i gybemáú` mói cqvm|
- 5.18 ciZ i`ciq`Wi e`v`v` ev`x, Aa`vq`fiEK i`ciq`W i`baviY, ikýve`i Kgi`e`mi mL`v ev`x|
- 5.19 RvZxq i`emmg`n `j tLvjv ti`L i`em D`hvc`bi e`e`v ceZb|
- 5.20 avivev`nK gj`vq`bi (MVBKvxb gj`vqb) gva`g iKlb `ejZv i`PvYZ K`i i`bivgggJK tmevi gva`g iKlb i`b`iZKiY|
- 5.21 cPijZ e`enwiK cixývi ms`vi mva`bi gva`g AvZi³ b`v`i c`v`bi mthvM eÜ Kiv|
- 5.22 mvgiÓK gj`vqb/mvgiQK cixµv I cve`jK cixµv c`v`iZi ms`vi|

6. ikvµg i`c`iLv

6.1 Iô-Øv`k tkvYi ikvµvi j`q` I D`iK`

j`q`

ikvµv_xi mveK iekv`ki gva`g gybieK, mvgmRK I `b`iZK , Ymáub Ávbx, `q, h`³ev`x I mRbkxj t`k`cigK Rbmáú` mói|

D`iK`

- K. ikvµv_xi mB ciZfv I mavebv iekv`ki gva`g mRbkxjZv, Kíbv I AbmiÜrmv ev`x`Z mrvqZv Kiv|
- L. ikvµv_xi gta` gybieK , Yveij, thgb- `b`iZK gj``era, mZZv, Aa`emvq, m`nòZv, k`Ljv, AvZ`iekvm, m`vPvi, A`b`i ciZ k`v`era, b`v`bKZv`era, tms`v`cY m`áUK I b`vqiePvi`era m`pfv`e M`_Z Kiv|
- M. gnvb fvlv Av`v`vjv, g`h`xi tPZbv I Amoc`vqK gj``evtai Av`jv`K ikvµv\_xi gta` t`k`cg, RvZxqZv`era I MYZ`v`SK gj``era RvMZ Kiv Ges mavebv`gq b`v`iK inmvte t`eto DV`Z mrvqZv Kiv|
- N. ikvµv_xi gta` evs`jv`k m`áUK mmsnZ Áv`bi i`fZ iPbv Z_v Gi B`v`nm, H`v`n`, ms`_Z, Av`\_mvgmRK I MYZ`v`SK i`v`b`iZKPPvi ciZ AvMn I thvM`Zv mói gva`g `ekK t`c`v`vU t``ki cMiz I Dbq`b Ae`vb ivL`Z m`qg K`i M`to tZvjv|
- O. k`gi ghv`v, K`v`Ri Af`vm I KvR Ki`Z AvMnx n`qv ciZ B`v`PK g`bv`ve iekv`K Kiv hv`Z ikvµv\_x e`v`<sup>3</sup>MZ Ges `jMZ Dfq ai`bi KvR m`áú`b `b`iZKZv I `v`qZkxjZvi c`v`Pq i`Z cv`i|
- P. mKj t`q`i KvHki thvM`thvM i`q`v ikvµv\_xi cigZ eisjv fvlvi `qZv m`p I mmsnZ Kiv Ges i`bqigZ cv`v`v`m M`to tZvjv|

- Q. $\text{e}^{\text{v}}\text{jv} \text{ m}^{\text{w}}\text{n}^{\text{t}}\text{Z}^{\text{t}}\text{i} \text{ A}^{\text{S}}\text{i}^{\text{b}}\text{i}^{\text{n}}\text{Z} \text{ b}^{\text{v}}\text{b}^{\text{K}} \text{ t}^{\text{m}}\text{s}^{\text{h}}, \text{ k}^{\text{L}}\text{jv} \text{ Ges} \text{ m}^{\text{L}} \text{ Dc}^{\text{t}}\text{f}^{\text{v}}\text{M} \text{ I} \text{ D}^{\text{t}}\text{NvU}^{\text{t}}\text{b} \text{ i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ i} \text{ t}^{\text{h}}\text{v}^{\text{M}}\text{Z}^{\text{v}} \text{ i}^{\text{e}}\text{K}^{\text{i}}\text{K} \text{Z} \text{ Kiv}$
- R. $\text{A}^{\text{v}}\text{a}^{\text{i}}\text{b}^{\text{K}} \text{ K}^{\text{g}}\text{t}^{\text{f}}\text{f}^{\text{t}} \text{ D}^{\text{P}}\text{i}^{\text{k}}\text{f}^{\text{v}}\text{m}^{\text{n}} \text{ m}^{\text{K}}\text{j} \text{ t}^{\text{f}}\text{f}^{\text{t}} \text{ K}^{\text{i}}\text{h}^{\text{K}}\text{i} \text{ t}^{\text{h}}\text{v}^{\text{M}}\text{t}^{\text{h}}\text{v}^{\text{M}}\text{i} \text{ c}^{\text{t}}\text{q}^{\text{v}}\text{R}^{\text{t}}\text{b} \text{ B}^{\text{s}}\text{t}^{\text{i}}\text{R} \text{ f}^{\text{v}}\text{l}^{\text{v}} \text{ t}^{\text{g}}\text{s}^{\text{i}}\text{j}^{\text{K}} \text{ f}^{\text{v}}\text{Z}^{\text{v}}\text{m}^{\text{g}}\text{n} \text{ A}^{\text{R}}\text{t}^{\text{b}}\text{i} \text{ g}^{\text{i}}\text{a}^{\text{t}}\text{g} \text{ i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ K} \text{ t}^{\text{h}}\text{v}^{\text{M}} \text{ K}^{\text{t}}\text{i} \text{ M}^{\text{t}}\text{o} \text{ t}^{\text{Z}}\text{v}^{\text{j}}\text{v}$
- S. $\text{i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ K} \text{ M}^{\text{v}}\text{Y}^{\text{t}}\text{Z} \text{ h}^{\text{t}}\text{3}, \text{ c}^{\text{x}}\text{Z} \text{ I} \text{ f}^{\text{v}}\text{Z}^{\text{v}}\text{i} \text{ m}^{\text{t}}\text{ c}^{\text{i}}\text{i}^{\text{P}}\text{Z} \text{ K}^{\text{i}}\text{v}^{\text{t}}\text{b} \text{ Ges} \text{ R}^{\text{x}}\text{e}^{\text{b}}\text{N}^{\text{i}}\text{b}^{\text{o}} \text{ I} \text{ i}^{\text{e}}\text{t}^{\text{k}}\text{i} \text{ c}^{\text{i}}\text{i}^{\text{c}}\text{w}^{\text{i}}\text{K} \text{ m}^{\text{g}}\text{m}^{\text{v}} \text{ m}^{\text{g}}\text{v}^{\text{a}}\text{t}^{\text{b}}\text{i} \text{ R}^{\text{b}} \text{ M}^{\text{v}}\text{t}^{\text{Z}}\text{i} \text{ c}^{\text{i}}\text{t}^{\text{q}}\text{v}^{\text{M}}\text{K} \text{ f}^{\text{v}}\text{Z}^{\text{v}} \text{ i}^{\text{e}}\text{K}^{\text{i}}\text{K} \text{Z} \text{ Kiv}$
- T. $\text{i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ K} \text{ c}^{\text{h}}\text{t}^{\text{3}} \text{ i} \text{ c}^{\text{i}}\text{Z} \text{ A}^{\text{v}}\text{M}^{\text{n}}\text{x} \text{ K}^{\text{t}}\text{i} \text{ t}^{\text{Z}}\text{v}^{\text{j}}\text{v} \text{ Ges} \text{ Z}^{\text{v}} \text{ I} \text{ t}^{\text{h}}\text{v}^{\text{M}}\text{t}^{\text{h}}\text{v}^{\text{M}} \text{ c}^{\text{h}}\text{t}^{\text{3}} \text{ e}^{\text{e}}\text{nv}^{\text{t}}\text{i} \text{ A}^{\text{v}}\text{Z}^{\text{h}}\text{e}^{\text{k}}\text{m}^{\text{x}}, \text{ D}^{\text{r}}\text{c}^{\text{i}}\text{v}^{\text{t}}\text{b}^{\text{k}}\text{x} \text{ j} \text{ Ges} \text{ m}^{\text{R}}\text{b}^{\text{k}}\text{x} \text{ j} \text{ i}^{\text{n}}\text{m}^{\text{v}}\text{t}^{\text{e}} \text{ Z}^{\text{v}}\text{i} \text{ Kiv}$
- U. $\text{i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ h}^{\text{v}}\text{t}^{\text{Z}} \text{ R}^{\text{x}}\text{e}^{\text{b}}\text{g}^{\text{v}}\text{b} \text{ D}^{\text{b}}\text{q}^{\text{t}}\text{b} \text{ i} \text{ R}^{\text{b}} \text{ R}^{\text{x}}\text{e}^{\text{b}}\text{N}^{\text{i}}\text{b}^{\text{o}} \text{ i}^{\text{e}}\text{f}^{\text{b}} \text{ m}^{\text{g}}\text{m}^{\text{v}} \text{ A}^{\text{b}}\text{m}^{\text{Ü}}\text{v} \text{ I} \text{ m}^{\text{g}}\text{v}^{\text{a}}\text{t}^{\text{b}} \text{ e}^{\text{A}}\text{v}^{\text{i}}\text{b}^{\text{K}} \text{ c}^{\text{i}}\text{m}^{\text{q}}\text{v} \text{ I} \text{ c}^{\text{x}}\text{Z} \text{ c}^{\text{t}}\text{q}^{\text{v}}\text{M} \text{ K}^{\text{i}}\text{t}^{\text{Z}} \text{ c}^{\text{v}}\text{t}^{\text{i}} \text{ t}^{\text{m}} \text{ j}^{\text{t}}\text{f}^{\text{t}} \text{ e}^{\text{A}}\text{v}^{\text{i}}\text{b}^{\text{K}} \text{ i}^{\text{v}}\text{o}^{\text{f}}\text{i}^{\text{t}}\text{z} \text{ I} \text{ t}^{\text{h}}\text{v}^{\text{M}}\text{Z}^{\text{v}} \text{ A}^{\text{R}}\text{t}^{\text{b}} \text{ m}^{\text{n}}\text{v}^{\text{q}}\text{Z}^{\text{v}} \text{ Kiv}$
- V. $\text{t}^{\text{t}}\text{t}^{\text{k}} \text{ Ges} \text{ e}^{\text{i}}\text{nv}^{\text{t}}\text{e}^{\text{k}}\text{i} \text{ c}^{\text{i}}\text{K}^{\text{i}}\text{Z} \text{ I} \text{ m}^{\text{v}}\text{g}^{\text{v}}\text{R}^{\text{K}} \text{ c}^{\text{i}}\text{i}^{\text{t}}\text{e}^{\text{k}} \text{ Ges} \text{ R}^{\text{j}}\text{e}^{\text{v}}\text{q} \text{ c}^{\text{i}}\text{i}^{\text{e}}\text{Z}^{\text{t}}\text{b} \text{ D}^{\text{c}}\text{i} \text{ i}^{\text{e}}\text{Z}^{\text{v}}\text{t}^{\text{i}}\text{v} \text{ K}^{\text{t}}\text{i} \text{ c}^{\text{i}}\text{i}^{\text{t}}\text{e}^{\text{k}}\text{M}^{\text{Z}} \text{ D}^{\text{c}}\text{v}^{\text{t}}\text{b} \text{ m}^{\text{a}}\text{u}^{\text{t}}\text{K} \text{ i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ i} \text{ c}^{\text{i}}\text{i}^{\text{P}}\text{Z} \text{ Kiv} \text{ G}^{\text{K}}\text{B} \text{ m}^{\text{v}}\text{t}^{\text{z}} \text{ m}^{\text{s}}\text{i}^{\text{k}}^{\text{o}} \text{ m}^{\text{K}}\text{t}^{\text{j}}\text{i} \text{ K}^{\text{j}}\text{v}^{\text{t}}\text{Y} \text{ i} \text{ R}^{\text{b}} \text{ H} \text{ m}^{\text{K}}\text{j} \text{ D}^{\text{c}}\text{v}^{\text{t}}\text{b}^{\text{t}}\text{K} \text{ i}^{\text{b}}\text{q}^{\text{S}}\text{Y} \text{ I} \text{ e}^{\text{e}}\text{nv}^{\text{i}} \text{ K}^{\text{i}}\text{v} \text{ t}^{\text{h}}\text{v}^{\text{M}}\text{Z}^{\text{v}} \text{ A}^{\text{R}}\text{t}^{\text{b}} \text{ m}^{\text{n}}\text{v}^{\text{q}}\text{Z}^{\text{v}} \text{ Kiv}$
- X. $\text{L}^{\text{v}}\text{t}^{\text{t}} \text{ I} \text{ c}^{\text{i}}\text{o}^{\text{f}}, \text{ k}^{\text{v}}\text{i}^{\text{x}}\text{i}^{\text{K}} \text{ m}^{\text{f}}\text{g}^{\text{Z}}\text{v}, \text{ t}^{\text{i}}\text{v}^{\text{M}}\text{-e}^{\text{v}}\text{w}^{\text{a}}, \text{ c}^{\text{R}}\text{b}^{\text{b}} \text{ v}^{\text{v}} \text{ Ges} \text{ e}^{\text{v}}\text{t}^{\text{3}}\text{M}^{\text{Z}} \text{ i}^{\text{b}}\text{i}^{\text{v}}\text{c}^{\text{E}}\text{v} \text{ B}^{\text{Z}}\text{v}^{\text{v}}\text{i} \text{ D}^{\text{c}}\text{i} \text{ i}^{\text{e}}\text{Z}^{\text{v}}\text{t}^{\text{i}}\text{v} \text{ K}^{\text{t}}\text{i} \text{ i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ K} \text{ v}^{\text{v}}\text{m}^{\text{a}}\text{u}^{\text{t}}\text{Z} \text{ R}^{\text{x}}\text{e}^{\text{b}}\text{h}^{\text{v}}\text{c}^{\text{t}}\text{b} \text{ i} \text{ c}^{\text{t}}\text{q}^{\text{v}}\text{R}^{\text{b}}\text{x} \text{q} \text{ Á}^{\text{v}}\text{b}, \text{ R}^{\text{x}}\text{e}^{\text{b}} \text{ f}^{\text{v}}\text{Z}^{\text{v}} \text{ I} \text{ i}^{\text{v}}\text{o}^{\text{f}}\text{i}^{\text{t}}\text{z} \text{ A}^{\text{R}}\text{t}^{\text{b}} \text{ m}^{\text{n}}\text{v}^{\text{q}}\text{Z}^{\text{v}} \text{ Kiv}$
- W. $\text{i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ i} \text{ g}^{\text{t}}\text{b} \text{ i}^{\text{b}}\text{R} \text{ i}^{\text{b}}\text{R} \text{ a}^{\text{g}}\text{x} \text{q} \text{ i}^{\text{e}}\text{k}^{\text{i}}\text{v} \text{ I} \text{ g}^{\text{j}}\text{t}^{\text{e}}\text{v}^{\text{a}} \text{ R}^{\text{v}}\text{M}^{\text{Z}} \text{ K}^{\text{i}}\text{v} \text{ c}^{\text{i}}\text{v}^{\text{k}}\text{v}^{\text{i}}\text{K} \text{ A}^{\text{b}} \text{ a}^{\text{g}} \text{ I} \text{ a}^{\text{g}}\text{v}^{\text{e}}\text{j}^{\text{t}}\text{t}^{\text{i}} \text{ c}^{\text{i}}\text{Z} \text{ k}^{\text{x}}\text{v}^{\text{k}}\text{x} \text{ j} \text{ n}^{\text{t}}\text{Z} \text{ m}^{\text{n}}\text{v}^{\text{q}}\text{Z}^{\text{v}} \text{ Kiv}$
- Y. $\text{i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ i} \text{ g}^{\text{t}}\text{a} \text{ e}^{\text{v}}\text{O}^{\text{v}}\text{j} \text{ Ges} \text{ f}^{\text{v}}\text{t}^{\text{t}} \text{ R}^{\text{v}}\text{Z}^{\text{v}}\text{-t}^{\text{M}}\text{v}^{\text{o}}\text{i} \text{ b}^{\text{v}}\text{i}^{\text{x}}\text{-c}^{\text{i}}\text{z} \text{ i}, \text{ e}^{\text{Y}}, \text{ t}^{\text{M}}\text{v}^{\text{t}}, \text{ f}^{\text{v}}\text{l}^{\text{v}}, \text{ m}^{\text{s}}\text{v}^{\text{t}}\text{Z}, \text{ i}^{\text{e}}\text{f}^{\text{b}} \text{ t}^{\text{k}}\text{i}^{\text{Y}} \text{ I} \text{ t}^{\text{c}}\text{k}^{\text{v}}\text{i} \text{ g}^{\text{v}}\text{b}^{\text{t}}\text{i} \text{ c}^{\text{i}}\text{Z} \text{ á}^{\text{v}}\text{Z} \text{ I} \text{ k}^{\text{x}}\text{v}^{\text{t}}\text{e}^{\text{v}}\text{a} \text{ m}^{\text{i}}\text{o} \text{ Kiv}$
- Z. $\text{i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ i} \text{ t}^{\text{t}}\text{m}^{\text{K}} \text{ I} \text{ g}^{\text{v}}\text{b}^{\text{m}}\text{K} \text{ i}^{\text{e}}\text{K}^{\text{i}}\text{t}^{\text{k}}\text{i} \text{ j}^{\text{t}}\text{f}^{\text{t}} \text{ m}^{\text{n}}\text{i}^{\text{K}}\text{f}^{\text{v}}\text{m}^{\text{u}}\text{g} \text{K} \text{ K}^{\text{i}}\text{h}^{\text{v}}\text{e}^{\text{i}}\text{j} \text{-} \text{t}^{\text{L}}\text{j}^{\text{v}}\text{a}^{\text{j}}\text{v}, \text{ k}^{\text{i}}\text{x}^{\text{i}}\text{P}^{\text{P}}\text{v}, \text{ m}^{\text{s}}\text{v}^{\text{t}}\text{Z} \text{ K}^{\text{g}}\text{K}^{\text{i}}\text{É}, \text{ P}^{\text{v}}\text{i}^{\text{z}} \text{ I} \text{ K}^{\text{v}}\text{i}^{\text{z}}\text{K}^{\text{j}}\text{v} \text{ A}^{\text{b}}\text{k}^{\text{x}}\text{j}^{\text{t}}\text{b} \text{ i}^{\text{b}}\text{q}^{\text{v}}\text{Z} \text{ A}^{\text{f}}\text{v}^{\text{m}} \text{ M}^{\text{t}}\text{o} \text{ t}^{\text{Z}}\text{v}^{\text{j}}\text{v}$
- _. $\text{R}^{\text{x}}\text{e}^{\text{b}}\text{v}^{\text{c}}\text{x} \text{ i}^{\text{K}}\text{f}^{\text{v}}\text{q} \text{ A}^{\text{v}}\text{M}^{\text{n}}\text{x} \text{ I} \text{ t}^{\text{h}}\text{v}^{\text{M}} \text{ K}^{\text{i}}\text{v} \text{ R}^{\text{b}} \text{ i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ i} \text{ e}^{\text{v}}\text{t}^{\text{3}}\text{M}^{\text{Z}} \text{ I} \text{ m}^{\text{v}}\text{g}^{\text{v}}\text{R}^{\text{K}} \text{ R}^{\text{x}}\text{e}^{\text{b}}, \text{ A}^{\text{v}}\text{a}^{\text{i}}\text{b}^{\text{K}} \text{ K}^{\text{g}}\text{t}^{\text{f}}\text{f}^{\text{t}} \text{ Ges} \text{ v}^{\text{t}}\text{-K}^{\text{g}}\text{m}^{\text{s}}\text{v}^{\text{t}}\text{t}^{\text{b}}\text{i} \text{ R}^{\text{b}} \text{ c}^{\text{t}}\text{q}^{\text{v}}\text{R}^{\text{b}}\text{x} \text{q} \text{ Á}^{\text{v}}\text{b}, \text{ f}^{\text{v}}\text{Z}^{\text{v}} \text{ I} \text{ i}^{\text{v}}\text{o}^{\text{f}}\text{i}^{\text{t}}\text{z} \text{ m}^{\text{t}}\text{p} \text{ Kiv}$
- ^. $\text{m}^{\text{n}}\text{t}^{\text{h}}\text{M}^{\text{Z}}\text{g}^{\text{j}}\text{K} \text{ K}^{\text{i}}\text{R} \text{ K}^{\text{i}}\text{v} \text{ g}^{\text{i}}\text{a}^{\text{t}}\text{g} \text{ i}^{\text{K}}\text{f}^{\text{v}}\text{x} \text{ i} \text{ t}^{\text{b}}\text{Z}^{\text{Z}}, \text{ m}^{\text{n}}\text{t}^{\text{h}}\text{M}^{\text{Z}}\text{v} \text{ I} \text{ t}^{\text{h}}\text{v}^{\text{M}}\text{t}^{\text{h}}\text{M} \text{ f}^{\text{v}}\text{Z}^{\text{v}} \text{ i}^{\text{e}}\text{K}^{\text{i}}\text{t}^{\text{k}} \text{ m}^{\text{y}}\text{g} \text{ Kiv}$

6.2 ielq KvWtgv:

Iô t₃K Aóg tkYi ielq KvWtgv, bai I mgq eEb

	mKj avivi Aveik'K ielq (mvaviY iKf _v , gv ^v mv iKf _v I Bst _i R iKf _v aviv)	cixf _{vi} bai	mgqeEb (Kvm iCiqW)		
			mvb _v nK	mvgr _{iq} K	ewIK
1.	e ^v jv	150	5	87	174
2.	Bst _i R	150	5	87	174
3.	M ^v YZ	100	4	70	140
4.	e ^v jv ^t k I iek _i Pq	100	3	53	106
5.	i ^e Áv	100	4	70	140
6.	Z ₃ I t ^h vM ^t h ^v M c ^h t ³	50	2	35	70
tgvU		650	23	402	804
mvaviY iKf _v avivi Aveik'K ielq					
7.	ag I b ₃ ZK iKf _v : Bm ^j vg I b ₃ ZK iKf _v /m ^v ag I b ₃ ZK iKf _v /Lóag I b ₃ ZK iKf _v /te ^s xag I b ₃ ZK iKf _v	100	3	53	106
8.	k ^v i ^x i ^K iKf _v I v ^v	50	2	35	70
9.	Kg I R ^x ebg ^L x iKf _v	50	2	35	70
10.	P ^v i ^z I K ^v i ^z K ^j v	50	2	35	70
tgvU		250	9	158	316
mvaviY avivi H ^v QK ielq (GK _U t ₃ lqv hvte)					
11.	f ₃ b ₃ M ^v ô ^x i f ^v lv I m ^s v ^v Z/K _U i ^K f _v /M ^v n ^v i ^e Áv/A ^v i ^e /m ^s v ^v Z/cw ^j	100	2	35	70
metgvU		1000	34	595	1190

de:

- c₃g iCiq^tWi e^vv₃ 60ig_{ib}U I Ab^vb^v iCiq^tWi e^vv₃ 50ig_{ib}U
- k₃bevi t₃K eaevi c₃Z^vb 6iCiqW Ges en^vúZ^vi 4iCiqW
- i^ebK c^vi^eK m^gt^ek (Assembly) Gi tgv^v 15ig_{ib}U Ges 3q iCiqW ci ga^vy i^ei₃Z 45ig_{ib}U
- B i^kd^tU cⁱi^Pw^jZ c₃Zô^tb me t₃f₃t³ 5ig_{ib}U K^ti mgq Kg n^te Ges ga^vy i^ei₃Z 25ig_{ib}U

6.3 mvaYiY ʷkʷv avivi beg-`kg tkʷi ʷelq-KvWʷgv, bʷi I mgq eÈb

ʷelʷqi aib	ʷelq	ciXʷvi bʷi	mgqeÈb (Kvm ʷciqW)		
			mʷβvʷnK	mʷgʷqK	eʷi IK
Aveik`K	1. eʷsjv	200	5	80	160
	2. BstʷiʷR	200	5	80	160
	3. MʷYZ	100	4	64	128
	4. ag I ʷbʷZK ʷkʷv (Bmʷjv I ʷbʷZK ʷkʷv/ ʷn`ag I ʷbʷZK ʷkʷv/ ʷLóag I ʷbʷZK ʷkʷv/ ʷtəxag I ʷbʷZK ʷkʷv)	100	2	32	64
	5. Z` I thʷMʷthʷM chʷ ³	50	2	32	64
	6. Kʷiʷqʷi ʷkʷv	50	1	16	32
	7. kvixʷiK ʷkʷv, ʷv`ʷeÁvb I tLjaʷjv	100	2	32	64
	ʷtgvU	800	21	336	672
kvLʷfiÈK ʷelq					
ʷeÁvb kvLvi Rb` Aveik`K ʷelq	8. c`v_ʷeÁvb	100	3	54	108
	9. imʷqb	100	3	54	108
	10. RxʷeÁvb/D`PZi MʷYZ	100	3	54	108
	11. eʷsjvʷ`k I ʷekcʷiPq/	100	3	54	108
	12. RxʷeÁvb/D`PZi MʷYZ/ ʷv`bʷMvôxi fʷlv I ms`Z/Kʷiʷkʷv/ Mʷn`ʷeÁvb/ fʷMʷj I ciʷtek/ Pʷiʷ I KvʷiKjv/ msMʷZ/ʷeʷmK tʷUW/ kvixʷiK ʷkʷv I μxov*	100	3	54	108
	meʷgvU	1300	36	606	1212
e`emvq ʷkʷv kvLvi Rb` Aveik`K ʷelq	8. e`emvq Dʷ`vM	100	3	54	108
	9. ʷnmʷeÁvb	100	3	54	108
	10. ʷdbʷvY I e`ʷsʷKs	100	3	54	108
	11. ʷeÁvb	100	3	54	108
	meʷgvU	1300	36	606	1212

ʷelʷqi aib	ʷelq	ciXʷvi bʷi	mgqeÈb (Kvm ʷciqW)		
			mʷβvʷnK	mʷgʷqK	eʷi IK
e`emvq ʷkʷv kvLvi Hʷ`QK ʷelq (GKʷU tʷlqv hvʷe)	12. fʷMʷj I ciʷtek/ eʷsjvʷ`k I ʷekcʷiPq/ Kʷiʷkʷv/Mʷn`ʷeÁvb/ ʷv`bʷMvôxi fʷlv I ms`Z/Pʷiʷ I KvʷiKjv/ msMʷZ/ʷeʷmK tʷUW	100	3	54	108
	meʷgvU	1300	36	606	1212
gvbʷeK kvLvi Rb` Aveik`K ʷelq	7. eʷsjvʷ`ki BʷZnm I ʷekmf`Zv	100	3	54	108
	9. fʷMʷj I ciʷtek	100	3	54	108
	10. A_bʷZ/tcʷibʷZ I bʷMʷiKZv	100	3	54	108
	11. ʷeÁvb	100	3	54	108
	12. A_bʷZ/tcʷibʷZ I bʷMʷiKZv/Pʷiʷ I KvʷiKjv/Kʷiʷkʷv/ /Mʷn`ʷeÁvb/ʷv` bʷMvôxi fʷlv I ms`Z/ Avʷiʷe/ms`Z/cʷij/ msMʷZ/ʷeʷmK tʷUW /kvixʷiK ʷkʷv I μxov*	100	3	54	108
	meʷgvU	1300	36	606	1212

`ðe`:

- ʷeÁvb, gvbʷeK I e`emvq ʷkʷv kvLvi nʷZ tʷtʷKʷβv GKʷU kvLvi ʷbevPb Kʷi ʷbevPZ kvLvi Aveik`K ʷelqmgʷn ʷbʷZ nʷe|
- mʷβvʷn 6ʷ`b ʷbK 6ʷciqW Kvm nʷe|
- ʷciqʷWi e`ʷβ I Abʷv` ʷelq lô tʷtʷK Aóg tkʷi Abiʷc nʷe|
- * kvixʷiK ʷkʷv I μxov ʷelqʷU ʷa eʷsjvʷ`k μxov ʷkʷv ciZôvʷbi ʷeÁvb kvLvi I gvbʷeK kvLvi ʷkʷv\_xiv Hʷ`QK ʷelq ʷnmʷe ʷbʷZ ciʷte|

7. $\mathbb{W}kLb - \dagger kLv \dagger bv \text{ } c \times \mathbb{W}Z \mid \dagger K\check{S}kj$

«kʲɪvɪmʲgi mō evˈeqʲbi gvaˈtʲg «kʲɪv_xi «kLb ɪbɔ̌ʒKiY A_vr «kLbdj ARb
 cavbZ ˈŌu weɪtʲgi Dci ɪbfikʲj| meʔPʲtʲg , iəZcYŋU nʲtʲQ tʲkʲYɪkʲtʲKi mɪmʲq
 mɪnʲhɪmʲZv I hʲtʲ_ych³ «kLb-tkLɪtvb cɔxɪZ I tʲKʲskʲjɪ mō cʲtʲqʷM Ges ɪʒZxɪu
 nʲtʲQ gɪvməʒZ cɪvˈcˈK I Abˈvbˈ «kʲɪvʲcKiʲYi mɪVK eˈenvi| Dfɔ tʲtʲɪB
 «kʲtʲKi fɪgKv AZˈš , iəZcY| GK K_vq «kʲɪv_xi «kLb ɪbɔ̌ʒKiʲYi tʲtʲɪ
 «kʲtʲKi tʲtʲq DĖg Avɪ «KQ tʲb| GLɪɪb weʲklɪfvʲe DʲjLˈ th, AʲbK Kɪvb I
 RɪUj KvR hv Kivi Rbˈ AʲbK kg I mgq cʲtʲqʷRb Zv hʲtʲ_vɪPZ cɔxɪZ I tʲKʲskʲ
 cʲtʲqʷM mɪnʲR I Kg mgʲtʲq mɪVKfvʲe mɔúb Kiv mœ| «kʲɪv_xi «kLɪbi tʲtʲɪI G
 ɪbqg cʲhʲRˈ| «kʲtʲK ce cˈɪZ ɪbʲtʲg Kg cɪikʲtʲg Ges AʲcʲɪvKZ Kg mgʲtʲq
 hʲtʲ_vɪPZ cɔxɪZ I tʲKʲskʲj cʲtʲqʷM «kʲɪv_xi «kLbdj ARb ɪbɔ̌ʒ KiʲZ cɪɪb|

7.1 $\mathbb{K}[x]_{\leq 1} = \mathbb{K}x + \mathbb{K}$ $\mathbb{K}[x]_{\leq 2} = \mathbb{K}x^2 + \mathbb{K}x + \mathbb{K}$ $\mathbb{K}[x]_{\leq 3} = \mathbb{K}x^3 + \mathbb{K}x^2 + \mathbb{K}x + \mathbb{K}$ $\mathbb{K}[x]_{\leq 4} = \mathbb{K}x^4 + \mathbb{K}x^3 + \mathbb{K}x^2 + \mathbb{K}x + \mathbb{K}$

7.1.1 |kLb-tkLv|bv c|mqvq |k¶v_xi m|mqZv LeB , i_ZCy| m|mqZvi `ôU t¶Î-
gbywmK m|mqZv I ^`nK m|mqZv| gbywmK m|mqZv A_vr |k¶Yxq w|tq |k¶v_xi
wPšb c|mqv D|ß Kiv| Ggb mgm˘v, ck ev KvR †|qv hvi mgva vb PŠv K†i tei
Ki‡Z nq| ^`nK m|mqZv n†jv nv‡Z-Kj†g KvR K†i tkLv| |k¶v jvf c|mqvq
|k¶v x†K m|mq ivLv|†M†j Kg mq†g I mn†R |kLb mœe|

7.1.2 gvbI GK aibI KvR 'xN mgfq gvbthvM 'z cvti bv | kiti'i tti'f gvbthvM
t' lqvI e'vib eq'f'i tPq Kg | weifb MtelYvq t'Lv tMtQ, 12 t'K 16 eQI
eqmx kiti'i tti'f G e'vib 8 t'K 10 gvbU, ZvI Avevi wbfI Kti KvRiU KZUv
AvKIYxq Ges Avb'vqK | AZGe tkvY Kvhuq nte ^ePI'cY | AvjvPbv, `jMZ
KvR, Mf, tJLv, AvKv, eZK, Aifbq, nvZ-KJtg KvR, c'kviEi, c'kb BZ'v'
cvtiVi mv' m'zI ttiL c'qvM Kiv nti kti'v xi gvbthvM aiti ivLv mae |

7.1.3 $c\sharp Z'K\ e\vee^3B\ \bar{Z}\S$ (every individual is a unique) | $\mathbf{k}\P_{\vee_x}\mathbf{i}\ \mathbf{t}\P_{\mathbf{i}}\hat{\mathbf{i}}\ Z\vee$
 $\mathbf{t}\mathbf{e}\mathbf{k}\ \mathbf{w}\mathbf{e}\mathbf{t}\mathbf{e}\mathbf{P}\mathbf{b}\mathbf{v}\mathbf{i}\ \mathbf{`}\mathbf{w}\mathbf{e}\ \mathbf{i}\mathbf{v}\mathbf{t}\mathbf{L}$ | $c\sharp Z'K\ \mathbf{k}\P_{\vee_x}\ Z\mathbf{v}\mathbf{i}\ \mathbf{i}\mathbf{b}\mathbf{t}\mathbf{R}\mathbf{i}\ \mathbf{g}\mathbf{t}\mathbf{Z}\vee\ K\mathbf{i}\ \mathbf{i}\mathbf{b}\mathbf{R}\ \mathbf{M}\mathbf{i}\mathbf{Z}\mathbf{t}\ \mathbf{t}\mathbf{k}\mathbf{t}\mathbf{L}$ |
 $Z\vee B\ e\vee^3\bar{Z}\mathbf{t}\S\mathbf{i}\ K_{\vee}\mathbf{w}\mathbf{e}\mathbf{t}\mathbf{e}\mathbf{P}\mathbf{b}\mathbf{v}\mathbf{q}\ \mathbf{t}\mathbf{i}\mathbf{t}\mathbf{L}\ h_{\vee}\mathbf{m}\mathbf{v}\mathbf{m}\mathbf{e}\ \mathbf{k}\P_{\vee_x}\mathbf{i}\ \mathbf{D}\mathbf{c}\mathbf{t}\mathbf{h}\mathbf{v}\mathbf{M}\mathbf{x}\ \mathbf{D}\mathbf{c}\mathbf{t}\mathbf{q}\ \mathbf{m}\mathbf{n}\mathbf{t}\mathbf{h}\mathbf{w}\mathbf{M}\mathbf{Z}\vee$
 $\mathbf{t}\mathbf{`}\mathbf{I}\mathbf{q}\mathbf{v}\ \mathbf{n}\mathbf{t}\mathbf{j}\ |\mathbf{k}\P_{\vee_x}\mathbf{i}\ c\sharp\mathbf{t}\P_{\vee}\mathbf{j}\mathbf{v}\mathbf{f}\ \mathbf{m}\mathbf{n}\mathbf{R}\ \mathbf{n}\mathbf{q}|$

7.1.4 $\text{nk}^{\text{f}}\text{v}^{\text{f}}\text{K ejv nq } \hat{\text{e}}\text{eK c}^{\text{f}}\text{m}^{\text{f}}\text{q}^{\text{f}} \mid \text{e}^{\text{f}}\text{Ki Dci eK } \neg\text{vcb K}^{\text{f}}\text{i weivU Bgviz } \hat{\text{Z}}\text{i Ki v}$
 $\text{nq} \mid \text{GKB}^{\text{f}}\text{v}^{\text{f}}\text{e R}^{\text{f}}\text{bv A}^{\text{f}}\text{f}^{\text{f}}\text{ÁZv, Á}^{\text{f}}\text{b, } \neg^{\text{f}}\text{Zvi Dci w}^{\text{f}}\text{f}^{\text{f}}\text{E K}^{\text{f}}\text{i bZb Á}^{\text{f}}\text{b, } \neg^{\text{f}}\text{Zv I}$
 $\text{g}^{\text{f}}\text{j}^{\text{f}}\text{teia AR}^{\text{f}}\text{b mn}^{\text{f}}\text{tR mnv}^{\text{f}}\text{qZv } \neg^{\text{f}}\text{Iqv hvq} \mid \text{ZvB nk}^{\text{f}}\text{v}^{\text{f}}\text{ xi R}^{\text{f}}\text{xeb } \neg^{\text{f}}\text{K Dcgv,}$

D`vniY w`tq Ges cejă Ávb, `ŋZvi mv†\_ ms†hvM ‾vcb K†i bZb Ávb, `ŋZv
AR†b mnvqZv Kiv n†j †kŋv jvf mnR nq|

7.1.5 $\mathbf{K}^{\mathbf{K}}\mathbf{V}_{\mathbf{xiv}}\mathbf{h}\mathbf{v}\mathbf{K}\mathbf{L}^{\mathbf{e}}\mathbf{Z}\mathbf{v}\mathbf{e}\mathbf{S}\mathbf{K}\mathbf{L}^{\mathbf{e}}|\mathbf{t}\mathbf{K}\mathbf{v}\mathbf{b}\mathbf{v}\mathbf{e}\mathbf{l}\mathbf{q}\mathbf{m}\mathbf{u}\mathbf{t}\mathbf{K}\mathbf{m}\mathbf{u}\mathbf{o}\mathbf{a}\mathbf{v}\mathbf{i}\mathbf{Y}\mathbf{v}\mathbf{j}\mathbf{v}\mathbf{K}\mathbf{i}^{\mathbf{e}}|$
 $\mathbf{b}\mathbf{v}\mathbf{e}\mathbf{S}\mathbf{g}\mathbf{L}^{\mathbf{K}}\mathbf{K}\mathbf{i}\mathbf{v}\mathbf{h}_{\mathbf{v}}\mathbf{K}^{\mathbf{K}}\mathbf{V}\mathbf{b}\mathbf{q}|\mathbf{G}\mathbf{t}\mathbf{Z}\mathbf{K}\mathbf{L}^{\mathbf{b}}\mathbf{i}\mathbf{m}\mathbf{A}\mathbf{v}\mathbf{j}\mathbf{b}\mathbf{n}\mathbf{q}\mathbf{b}\mathbf{v}|\mathbf{e}\mathbf{S}\mathbf{K}\mathbf{L}^{\mathbf{t}}\mathbf{j}\mathbf{e}\mathbf{v}$
 $\mathbf{t}\mathbf{K}\mathbf{v}\mathbf{b}\mathbf{v}\mathbf{m}\mathbf{g}\mathbf{m}^{\mathbf{v}}\mathbf{m}\mathbf{g}\mathbf{v}\mathbf{a}\mathbf{v}\mathbf{b}\mathbf{i}\mathbf{h}\mathbf{w}^3|\mathbf{c}\mathbf{x}\mathbf{Z}\mathbf{e}\mathbf{S}\mathbf{c}\mathbf{t}\mathbf{q}\mathbf{M}\mathbf{K}\mathbf{i}\mathbf{t}\mathbf{j}\mathbf{A}\mathbf{b}\mathbf{i}\mathbf{c}\mathbf{m}\mathbf{g}\mathbf{m}^{\mathbf{v}}\mathbf{i}\mathbf{m}\mathbf{g}\mathbf{v}\mathbf{a}\mathbf{b}$
 $\mathbf{w}\mathbf{t}\mathbf{R}\mathbf{B}\mathbf{K}\mathbf{i}\mathbf{t}\mathbf{Z}\mathbf{c}\mathbf{v}\mathbf{i}|\mathbf{Z}\mathbf{v}\mathbf{B}\mathbf{g}\mathbf{L}^{\mathbf{t}}\mathbf{i}\mathbf{t}\mathbf{p}\mathbf{t}\mathbf{g}\mathbf{e}\mathbf{S}\mathbf{v}\mathbf{i}\mathbf{D}\mathbf{c}\mathbf{i}\mathbf{.i}\mathbf{z}\mathbf{t}\mathbf{I}\mathbf{q}\mathbf{c}\mathbf{t}\mathbf{q}\mathbf{R}\mathbf{b}|$

[illegible]

7.1.7 $\|kLb\sharp K \neg vq\|Ki\sharp Yi \text{ } Rb'' \text{ } c\sharp qvRb \text{ } Abkxj\sharp bi \text{ } e\ddot{e}\neg v| \text{ } bZbf\sharp e \text{ } A\|RZ \text{ } \acute{A}vb, \text{ } `q\sharp Zv$
 $ev\sharp ev\sharp Abkxj\sharp b \text{ } Kiv \text{ } n\sharp j \text{ } GK\| \neg \sharp K \text{ } thgb \text{ } \|kLb \neg vq\| nq, \text{ } Ab\| \neg \sharp K \text{ } \|kLb \text{ } m\acute{A}v\sharp bi$
 $m\sharp hvM \text{ } m\|o \text{ } nq|$

[illegible]

7.1.9 ɪkʰɪʔKi wekim _vKʰZ nʰe th, Zvi mKj ɪkʰv_xB tKlvi mg_ mʰúb| mevi
tKlvi Dcvq l mʰzi gʰa_ cv_K_ _vKʰZ cvʰi, Zʰe Dch³ cʰiʰek l mnʰhmZv
tʰj mevb tʰʰL| tKvb ɪkʰv_xi cʰiZ ɪkʰɪʔKi tʰiZeiPK gʰbʰfve _vKʰj H ɪkʰɪʔK
t_ʰK ɪkʰv_xi DcKZ nʰlqi mʰvebv LeB Kg| ZvB cʰiZU ɪkʰv_xi cʰiZ ɪkʰɪʔKi
DʰP aviYv _vKv evĀbxq| tKvb ɪkʰv_xʰK KLb l ōgv_vq tMeiŋ, ōtZvʰK _ʰq ɪKQB
nʰe bʰŋ, ōMvaŋŋ, ōAc_v_ŋ BZ_v_ŋ tKvʰbvi aʰiʰbi tʰiZeiPK ev ɪbiarmngjK K_v ejv
hʰʰe bv| teZ eʰenvi ev tKvʰbvi cKvi kvixiK ev gvbwmK kw_ c_vb ɪkʰv jvʰʰi
Aʰivq Ges ivŋxq AvBʰb kw_ʰʰM Aciva| Drmn c_vb Kiv nʰj ɪkʰv_xi tKlvi
AvMn AʰbKUv tʰeʰ hvq|

• **mn̄hwmZvgjK (Collaborative)** : MVbeṽ`x tkiY Kv̄hμg n̄e mn̄hwmZvgjK|
 w̄kŋv_xiv `t̄ji c̄Z`K̄i t̄_K c̄Z`K̄i w̄kL̄e Ges ḠK Ab̄`K̄i w̄kL̄Z mn̄hwmZv
 Kīe| hLb w̄kŋv_xiv mḡeZf̄v̄e w̄kLb c̄μqv ch̄jvPbv I Abā`v̄b̄ K̄i ZLb Zviv
 ḠK Ab̄` t̄_K djcm̄U MnY Kivi m̄hM̄ c̄iq|

• **AbmÜvb ev mgm̄w̄fiĖK (Inquiry or Problem-Based)**: MVbeṽ`i gjK\_v n̄`Q
 mgm̄vi mgvab| G t̄ŋt̄ŋ w̄kŋv_xiv AbmÜvgjK c̄x̄Zi gvā`g ck K̄i, t̄Kv̄bv
 w̄kQi m̄Üvb K̄i Ges mgvab ev DĖi c̄vI q̄vi Rb̄` w̄eifb c̄x̄Z I t̄K̄skj c̄q̄M K̄i|

• **w̄eKvkgvb (Evolving)**: w̄kŋv_xiv Zv̄`i ch̄jvPbv I Abā`v̄bi gvā`g c̄e
 ĀvRZ t̄Kv̄bv Áv̄b̄K̄i Am̄Z̄` I Am̄óY ḡb̄ KīZ c̄v̄i| t̄m̄t̄ŋt̄ŋ Zviv
 AbmÜv̄bi gvā`g bZb̄ w̄m̄x̄v̄š̄ t̄c̄š̄Q̄v̄e| c̄t̄Póv̄ Pw̄j̄t̄q̄ h̄v̄e Ges bZb̄ Áv̄b̄ I
 Āv̄f̄ÁZ̄w̄fiĖ̄Z̄ c̄ej̄ǟ w̄m̄x̄v̄š̄ c̄bms̄`v̄i Kīe|

8.3 MVbeṽ`i m̄v̄`_ mgMZveṽ`i (Gestalt Theory) tek w̄gj Av̄t̄Q| Gestalt R̄vgv̄b
 k̄ǟ h̄vi A_ Structure ev MVb| w̄kLb c̄μqv̄q̄ av̄iYv̄ MVb c_K c_K Dcv̄`v̄bi
 Dci bq, m̄vḡMKf̄v̄e Dcv̄`v̄b̄, t̄j̄v̄i Dci w̄bfi K̄i| MVbeṽ`i I gj K_v av̄iYv̄
 MVb hv̄ w̄bfi K̄i w̄k̄ȳv_xi c̄ej̄ǟ av̄iYv̄, Áv̄b̄, Āv̄f̄ÁZ̄v̄ I c̄w̄ic̄w̄kK̄ Aē`v̄i
 Dci| mgMZveṽ` Abhv̄q̄x̄ t̄Pv̄L, Kv̄b̄, ZK BZ̄`w̄` B̄v̄`q̄, t̄j̄v̄ Øviv Avgiv̄ th
 Z_̄, t̄j̄v̄ c̄v̄B̄ t̄m̄, t̄j̄v̄K̄ Avgiv̄ ḡb̄ ḡb̄ c̄Yv̄½̄ īc̄ t̄`B̄, Av̄i MVbeṽ`i ḡt̄Z̄
 Avgiv̄ Gme B̄v̄`q̄Mv̄n̄` Z_̄, t̄j̄v̄ w̄`t̄q̄ c̄t̄Z̄`K̄ Z̄š̄ GK̄U gvb̄m̄K̄ w̄P̄Ī ^Z̄īi
 gvā`g Āv̄f̄ÁZ̄v̄ Arb̄ Kīi| Gf̄v̄e Āv̄RZ Āv̄f̄ÁZ̄v̄ GK̄Ui Dci GK̄U m̄v̄R̄t̄q̄
 w̄kLb m̄óv̄b̄ Kīi|

9. **w̄kLb-t̄kL̄v̄bv̄ Kv̄hμg c̄w̄iP̄vj̄b̄vi K̄iZc̄q̄ c̄x̄Z̄ I t̄K̄skj**
 w̄kŋv_xi w̄kLb Āb̄K̄v̄s̄t̄k̄ w̄bfi K̄i w̄kŋK̄ KZK̄ c̄w̄iP̄w̄j̄Z̄ c̄x̄Z̄ I t̄K̄sk̄t̄j̄i
 Dci| w̄kŋv_x̄`i ŋ̄gZ̄v̄ I ceȲZ̄v̄ Ges c̄v̄Vī ^ēw̄k̄t̄ó̄`ī w̄fiĖ̄Z̄ c̄x̄Z̄ I t̄K̄sk̄j̄
 w̄beṽP̄b̄ Kiv̄ c̄t̄q̄R̄b̄| c̄x̄Z̄ I t̄K̄sk̄j̄ m̄v̄K̄ n̄j̄ Ges h_vh̄`f̄v̄e c̄t̄q̄M̄ Kiv̄ n̄j̄
 w̄kŋv_x̄ m̄n̄R̄ w̄kL̄Z̄ c̄v̄i| GLv̄t̄b̄ K̄t̄q̄K̄U c̄x̄Z̄ I t̄K̄sk̄t̄j̄i m̄s̄ŋ̄ŋ̄B̄ c̄w̄iP̄q̄
 t̄`I q̄v̄ n̄t̄j̄v̄:

9.1 **ck-DĖi c̄x̄Z̄ (Question-Answer Method)**
 ck-DĖi GK̄U ēūj̄ c̄P̄j̄Z̄ I Kv̄hKī c̄x̄Z̄| G c̄x̄Z̄i m̄v̄K̄ c̄t̄q̄M̄i gvā`g
 w̄kŋv_x̄K̄ m̄μq̄ t̄īL̄ w̄kL̄b̄ mn̄hwmZv̄ Kiv̄ hv̄q| w̄eifb̄ D̄t̄Īt̄K̄` ck Kiv̄ n̄t̄q̄
 _v̄K̄| t̄kL̄vi Rb̄` ck, w̄kL̄bd̄j̄ ARb̄ ciḡt̄cī Rb̄` ck, t̄Kv̄b̄ w̄ēt̄k̄l̄ K̄t̄gī
 Dc̄h̄wm̄Zv̄ hv̄P̄v̄B̄ Kivi Rb̄` ck, BZ̄`w̄` tek̄ K̄t̄q̄K̄U aib̄ īt̄q̄t̄Q̄|

- 9.2 **ck Kivi īx̄Z̄**
- mḡ` t̄k̄iȲt̄K̄ D̄t̄Īt̄K̄` K̄i ck Kiv̄| c_̄t̄ḡ t̄Kv̄t̄bv̄ w̄kŋv_x̄K̄ w̄b̄`ó̄ K̄i
 Zv̄t̄K̄ ck Kiv̄ n̄j̄ t̄k̄iȲi Ab̄` w̄kŋv\_xiv̄ w̄b̄`t̄q̄ _v̄t̄K̄, Aḡt̄bv̄t̄h̄M̄x̄ n̄Z̄
 c̄v̄i| mev̄B̄t̄K̄ m̄μq̄ īv̄L̄vi Rb̄` mḡ` t̄k̄iȲt̄K̄ ck KīZ̄ n̄q̄|
 - w̄P̄š̄v̄ K̄i DĖi w̄v̄K̄ Kivi Rb̄` w̄K̄Q̄v̄ mḡq̄ t̄`I q̄v̄|
 - DĖi `v̄t̄b̄ k̄•L̄j̄v̄ ēR̄v̄q̄ īv̄L̄v̄| c̄v̄iM̄ w̄kŋv_xiv̄ n̄v̄Z̄ DV̄v̄e| mevī GK̄m̄v̄t̄_̄
 DĖi t̄`I q̄v̄i Af̄`v̄m̄ Z̄`v̄M̄ Kiv̄t̄Z̄ n̄e|
 - w̄kŋv_x̄t̄K̄ w̄b̄`ó̄ K̄i DĖi w̄`t̄Z̄ ej̄v̄| GKB̄ w̄kŋv_x̄t̄K̄ ev̄i ev̄i DĖi
 t̄`I q̄v̄i m̄t̄h̄w̄m̄ bv̄ w̄`t̄q̄ ch̄v̄q̄μ̄t̄ḡ mev̄B̄t̄K̄ m̄t̄h̄w̄m̄ t̄`I q̄v̄| c̄t̄q̄R̄t̄b̄ DĖi
 `v̄t̄b̄ B̄v̄t̄Z̄ w̄`t̄q̄ m̄n̄v̄q̄Z̄v̄ Kiv̄| DĖi m̄v̄K̄ bv̄ n̄j̄ Ab̄` w̄kŋv_x̄t̄K̄ DĖi
 w̄`t̄Z̄ ej̄v̄|
 - m̄v̄K̄ DĖi c̄biv̄eĖ̄ Kiv̄|
 - Gicī c̄ē n̄v̄Z̄ DV̄v̄q̄ w̄b̄ Ggb̄ Ac̄v̄iM̄ w̄kŋv_x̄t̄K̄ GKB̄ c̄t̄kī DĖi w̄`t̄Z̄
 ej̄v̄|
 - c̄t̄q̄R̄t̄b̄ AbmÜvb̄x̄ ck (probing question) Kiv̄| GK̄U c̄t̄kī DĖi t̄_K̄
 th̄ ck R̄v̄t̄M̄ Z̄v̄t̄K̄ AbmÜvb̄x̄ ck ej̄v̄ n̄q̄|

9.3 **c̄t̄kī aib̄**

- c̄t̄kī f̄v̄l̄v̄ n̄ē m̄n̄R̄ I t̄k̄iȲ Dc̄h̄v̄M̄x̄|
- ck̄ n̄ē w̄kŋv_xī w̄P̄š̄v̄ D̄Īx̄c̄K̄ I t̄c̄iȲv̄ m̄īó̄K̄v̄ix̄| Ô̄t̄K̄b̄ô̄, Ô̄w̄K̄f̄v̄ēô̄, Ô̄K̄v̄iȲ K̄x̄ô̄,
 Ô̄ēv̄L̄`v̄ K̄īô̄, Ô̄ēt̄K̄iȲ K̄īô̄, Ô̄Z̄j̄bv̄ K̄īô̄ BZ̄`w̄` Øviv̄ ck Kiv̄ n̄j̄ w̄P̄š̄v̄ K̄ī DĖi
 t̄eī KīZ̄ n̄q̄|

- thme ctki DĒi ōn'vō ev ōbō Ggb ck bv KivB fvj | ʔZ ʔbfi ck thgb ōKxō, ōtKō, ōtKv_vqō, ōKqūō ev ōKvK eʔjō BZ'w' ck hZUv mæ cʔinvi Kiv|
- chvqμtg Ggbfvte ck Kiv thb ckmgt̄ni DĒi t_ʔK ʔelqe' mǎúʔK ʔúó aviYv jvf Kiv hvq| cʔqvRʔb cʔkvĒʔii gʔS gʔS AvʔjvPbv Kiv|
- AbmŪvbgjK ck (probing question) A_vr GKūU ctki DĒi t_ʔK D'w'Z ck Kʔi ʔelʔqi cYZv Avbv cʔqvRb| thgb-
gj ck: ʔe'v'jʔq ʔkŷv_xʔ' i Mo Dc'w'Z KZ?
DĒi : mvaviY mgʔq 85%, ʔeʔkl mgʔq 50%
AbmŪvbgjK ck: ʔeʔkl mgʔq Kg ʔKb?
DĒi : avb ʔivcY I avb KvUvi ʔgsmʔg ʔQʔjgʔqʔ' i AʔbʔK KūlKvʔR Avf fveKʔK mnvqZv Kʔi ZvB Zviv ʔe'v'jʔq Avʔm bv|

9.4 ʔkʔʔKi KiYxq

- mūVK DĒʔii Rb' ʔkʔʔv_xʔK Drm̄n c`vb
- f j DĒʔii Rb' ʔbʔ'kbv I ʔKLʔZ AbʔciYv t`lqv
- mūVK DĒʔii cm½ ʔUʔb AvʔjvPbv gva'ʔg aviYv jvf m̄nvqZv Kiv
- ʔkʔʔv_xʔK ck KiʔZ m̄h̄m t`lqv, Drm̄nZ Kiv Ges ʔkʔʔv\_xi ctki DĒi t`lqv

10. ʔjMZ mnʔh̄mZvgjK ʔkʔʔv c×w'Z

ʔjMZ mnʔh̄mZvgjK c×w'Z GKūU mdj ʔKLbc×w'Z| G c×w'ZʔZ GKB eqtμʔgi ev GKB chvʔqi ʔkʔʔv_xiv ci'úi ʔg_w'ʔqvi gva'ʔg ʔkʔʔv jvf Kʔi| Gʔʔʔʔ ʔkʔʔʔKi fūgKv cʔivʔ ʔKš , iəZcY| ʔjMZ KvʔRi gva'ʔg cūZūU ʔkʔʔv_xi ʔa Ávb-ʔʔZvB e× cʔq bv, mvʔ_ mvʔ_ tek ʔKQ gvbʔeK , Yveʔji ʔeKvK NʔU| K_v ʔkvbi I K_v ejvi k·Ljv Abm̄iY, cigZ m̄nòZv, ʔbZZ, mgʔSvZv BZ'w' , Yveʔji ʔeKvK NʔU|

10.1 ʔj MVb

ʔeʔbfvte ʔj MVb Kiv hvq| mg-mvgʔ_ʔi ʔkʔʔv_xʔ' i ʔj, ʔgk mvgʔ_ʔi ʔkʔʔv_xʔ' i ʔj, ʔelqʔfĒK ʔj, AĀjʔfĒK ʔj BZ'w'| AʔbK ʔʔʔʔ ʔgk mvgʔ_ʔ_ ʔʔji m̄eav Abʔ' i ʔʔʔq ʔKQUv ʔeik| cūZ cʔVi Rb' ev cūZ ʔelʔqi Rb' bZb Kʔi ʔj MVb KiʔZ ʔMʔj AʔbK mgq jvʔM| ZvB ʔkūYʔkʔK

(ʔh̄b c_g ʔcūiqʔW Kv̄m ʔbb) ʔj MVb Kiʔeb| cʔqvRʔb GK gvm Aʔi Aʔi bZb Kʔi ʔj MVb Kiʔeb| GʔZ ʔkʔʔv_xʔ' i ʔg_w'ʔqvi cūimi e× cʔq| GKB ʔkūYi ʔeʔfb ʔelʔqi ʔkʔʔKMY ʔkūYʔkʔK KZK M̄vZ ʔj , ʔjvʔKB ʔjMZ KvʔR ʔbʔqʔRZ Kiʔeb| cūZūU ʔʔji AvKvi 6Rb t_ʔK 8Rb nʔj fvj, Zʔe 10Rʔbi ʔeik nʔqv evĀbxq bq| cʔZ'K ʔʔji GKūU Kʔi bvg_vKʔj m̄eav nq| dj, dj, cūL, b`x ev is Gi bʔg ʔʔji bvg ivLv hvq|

10.2 ʔjMZ KvʔRi Avmb ʔeb'vm

ʔjMZ KvʔRi Avmb ʔeb'vm Ggb nʔe hvʔZ ʔʔji mKj ʔkʔʔv_x gʔLvqūL emʔZ cʔʔi| ʔkūYKʔʔi AvKvi eo nʔj Ges chvʔ AvmevecĀ_vKʔj, cūZ ʔj ʔMvj ʔUeʔʔi Pvicvʔk emʔe| Gi c AvmevecĀ bv_vKʔj cūKv ʔgʔSʔZ gʔ' i I ʔMvj nʔq emʔZ cʔʔi| bZev c_g ʔeʔĀi ʔkʔʔv_xiv Nʔi ʔØZxq ʔeʔĀi gʔLvqūL emʔe, Gfvte ZZxq ʔeĀ Nʔi PZ_ ʔeʔĀi gʔLvqūL| Gʔʔʔʔ cūZ ʔʔji ʔkʔʔv_xʔ' iʔK ci ci ʔʔeʔĀ emʔZ nʔe| ʔkʔʔK ʔjMZ KvʔR eʔSʔq ʔ' lqvī mvʔ_ mvʔ_B ʔjexfvte eʔm ʔjMZ KvʔR ʔiə KiʔZ nʔe| AvmevecĀ Uvbwūb Kʔi mgq bó Kiv hvʔe bv|

10.3 ʔjMZ KvʔR Kivi cūmqv

- ʔʔj f̄vM nʔqvī Av̄MB mgʔeZ Kv̄m ʔkʔʔK ʔúó Kʔi ʔjMZ KvʔR eʔSʔq ʔ' ʔeb|
- ʔkʔʔK ʔʔji GKRBʔK GKūU KvʔRi Rb' ʔjʔbZv gʔbvqʔ ʔ' ʔeb| chvqμtg ʔʔji cʔZ'KʔK ʔjʔbZvi ʔwqZ ʔ' ʔeb|
- ʔkʔʔv_xiv ʔʔj f̄vM nʔq emʔe| ʔʔji cʔZ'K ʔelqūU ʔbʔq ʔPšv Kiʔe| Zvici AvʔjvPbv ʔiə Kiʔe| GKRB K_v ejvi mgq Ab'iv gb ʔ' ʔq ʔbʔe| K_v gʔS ʔKD K_v ejʔe bv| Zʔe AvʔjvPbv Ah_v ʔxN ev cm½ eʔnfZ nʔj ʔjʔbZv f`fvte ʔbqšY Kiʔe|
- ʔʔji cʔZ'K AvʔjvPbvq AskM̄nY Kiʔe|
- AvʔjvPbv gva'ʔg ZĒ, Z_, h̄³ Dc'vcb I h̄³ LĒb Kiʔe|
- Kvʔiv K_v AcQ` nʔj ev gbtcZ bv nʔj ʔah aʔi ʔbʔZ nʔe, cʔi h̄³ ʔ' ʔq LĒb Kiv hvʔe, i vM Kiv ev Aʔkvfb AvPiY Kiv hvʔe bv|
- ʔRvi Kʔi Abʔ' i Dci ʔbʔRi gZvgZ Pwcʔq ʔ' lqvī ʔPóv Kiv hvʔe bv|

- Av#jvPbvi djdjdj `t#ji m×vš miv#e jL#Z nte Ges meib#K tgb#b#Z nte|
- cieZ#Z mg#eZ K#m k#K#Ki #b#`k#bm#i H Av#jvPbvi `j#bZv `t#ji c#Z#e`b Dc`vc#b Ki#e| Ab` `t#ji ck\_vK#j `t#ji c#K#j th tK#b#v GKRb D#i #`#e|
- `jMZ KvR Pjvi mgq tK#b#v gZ#bK` ev mgm`v t`Lv #`t#j `j#bZv nvZ Z#j k#K#Ki #b#`kbv PvB#e|

10.4 `jMZ Kv#Ri aib

`jMZ KvR cavbZ AbmÜvbgjK ev mgm`v f#E#K nte| `jMZ Kv#Ri #elq #Pšv D#xcK, mRbkxj I #e#kIYag# nte| m#aviY Z#\_ ev #vbgjK R#bvi #elq `jMZ Av#jvPbvi #elq nq bv| Zv#Z AbmÜvb ev #Pšv D#xcK #KQ_v#K bv|

10.5 `jMZ Kv#Ri K#qK#U D`vniY

K. evsjv#`k t\_#K #efb cR#Zi c#L #gvMZ #ej#b nIqvi KviY I Zv#`i i#v#i Dcvq AbmÜvb|

L. M#gi #bi#i g#bI#K `v` m#PZb Kivi t#t#i k#K#v_x#`i KiYxq #baviY|

M. cix#t#Yi gva#tg #efb cKvi g#Ui `e#kó` #P#yZKiY|

N. evsjv#`ki k#i#`i A#Kvi i#vq miKvi, m#vR I A#ffv#Ki KiYxq #baviY|

O. GK#U Ab#Q#`i m#igg D`N#Ub|

10.6 `jMZ Kv#Ri #elq m#v#e m#VK bq-

K. AbcvZmn evqi Dcv`vbm#ni b#v

L. evsjv#`ki f-cK#Zi eYbv

M. m#K t`kmg#ni ivRavb, RbmsL`v I gv_wcQ Avq

N. cigvYi M#b eYbv

O. Z_ A#Kvi A#Bb eYbv

10.7 `jMZ Kv#Ri gva#tg #KLb `ejZvi Aemvb

k#K#v_x#`i tKD tKD #efb Kvi#Y #baw#Z #KLbdj ARb Ki#Z c#i bv| avive#nK gj`vq#bi gva#tg #KLb `ejZv#ú#b k#K#v\_x#`i #P#yZ K#i Zv#`i Rb` #e#kI `jMZ Kv#Ri e`e`v Kiv hvq| G t#t#i GKB t#k#Yi GKRb

#KLbdj ARbKvix tPŠKm k#K#v_x#K `j#bZv m#v#e `t#ji Ab#`i#K #KLb m#h#MZv Kivi `wqZ t`Iqv nq| k#yK `j#bZv#K c#eB c#q#Rb#q #b#`kbv #`tq t`b| mgchv#qi k#K#v\_x #v#v Ab` k#K#v_x#`i#K #KLb m#h#MZv t`Iqv#K #Peer Learning# ejv nq|

10.8 `jMZ KvR PjvKvjxb k#K#Ki KiYxq

`jMZ KvR PjvKvjxb k#K#K #i #i c#Z`K `t#ji KvR ch#e#Y Ki#eb| thLv#b hLb c#q#Rb #b#`kbv I m#vqZv #`#eb| cieZ#Z `jMZ KvR Dc`vc#bi mgq f#j-#š ev A#úYZv\_vK#j av#q #`#eb|

11 c`kb c#Z (Demonstration Method)

c`kb c#Zi gjK\_v n#jv tK#b#v #KQ t`vL#q G#U m#ú#K av#v jv#f k#K#v_x#`i#K m#vqZv Kiv| tK#b#v #KQ Dc`vc#b #a eYbv ev Av#jvPbvq m#x#v# bv t_#K Zv t`Lv#b#v n#j av#v jv#f m#R nq Ges G#Z k#K#v\_x#`i AvMn I Drm#v e#x cvq| G c#Z#Z cv#Vi #elq m#kó ev`e e` ev cZ`#f#v#e c#u#v t`vL#q eYbv, Av#jvPbv ev ck-D#i#i gva#tg av#v jv#f m#vqZv Kiv nq| thgb- GK#U Rev d#ji Ask,#jv t`vL#q d#ji Ask,#jvi m#ú#K av#v AR#b m#vqZv Kiv; t#k#YK#t#i k#K#v\_x#`i m#v#b hšc#Z m#thvRb K#i `v#i m#\_ cvZjv m#j#dD#iK G#mW #g#k#q nvB#W#Rb c`Z K#i t`Lv#b#v BZ`#|

A#bK t#t#i ev`e e` ev N#Ub m#v#i t`Lv#b#v m#e nq bv| t#t#i A#e#e#i m#v#h` av#v jv#f m#vqZv Kiv hvq| thgb- P#` ev mhM#Y m#ú#K av#v jv#fi Rb` t#k#YK#t#i m#W ev #W#f#Wi gva#tg g#è#g#Wqv c#_ex I P#`i #bR #bR K#t#\_ NYb t`vL#q M#Y N#vi #elq#U c#i#vi Kiv hvq| c#R#i ev g#è#g#Wqv bv_vK#j P#Ui gva#tg t`Lv#b#v hvq| tivj-tc c#Z#Zi t#kLv#b#v hvq| t#t#i #e#kI k#K#v\_x#`i#K t#k#YK#t#i evB#i #b#q ev`e N#Ub cZ`#f#v#e t`vL#q k#K#v jv#f m#vqZv Kiv hvq| thgb- f#g#t#qi KviY,#jv cZ`#f t`Lv#b#v hvq| m#e n#j H#Zn#mK`v#b #b#q #efb #b`kb t`vL#q I eYbv K#i av#v jv#f m#vqZv Kiv hvq| thgb- K#gjvi tKvUev#o kvjeb #env#i c#i`k#b #b#q ZrKvjxb t#š#m#f`Zv m#ú#K Rv#Z m#v#h` Kiv|

c`kb c×iZiZ iKfV\_x`i AbmÜrmv eix cvq| mnR mVK aviYv jvf KiZ
 cvi| iKlb A#cVVKZ `xN`vq nq| c`kb c×iZiZ jV iVLiZ nte thb me
 iKfV_x`úó t`LiZ cvq|

12. AbmÜbgjK KvRi aib

AbmÜbgjK KvR gjZ KgK`K c×iZ| WDBi mμqZv ZiEi fEiZ
 cwiPwjZ G c×iZiZ iKy_vxiv GKkfve ev `jMZfve iRi`i cPóvq
 iBqZiŠK c×iZiZ iKy_v jvf Kti _vK| G c×iZiZ iKy_v_x tKvbn ielq ev
 NUbv ev mgm`vi KviY, djvdj, ciZμq BZ` D`NUb Kti| b_cî chvjvPbv,
 ci`kb, chteY, mVvrKvi MnY bvbvfe AbmÜb KvR ciPvjbv Kiv hvq| |
 D`niY-

- hemgvRi AvKv ms`Zi ciZ ceYv eix KviY I djvdj
- iKí AÁj evq `lYi KviY I djvdj
- Lv` Drcv`b AvZgvîvq ivmviK KxUbvK `e`e`en`i ciZμq

12.1. AbmÜbgjK c×iZiZ iKlb ciμq

cZ`Kü AbmÜbi Rb` GKü ielq ev mgm`v ibevPb KiZ nq| G c×iZiZ
 hveZxq Kvμg cavBZ cvPüU chvq ciPwjZ nq| chvq, jv n`Q-

K. mgm`v/D`iK` iBaviY

L. ciKíbv cYqb

M. Z` msMn

N. Z` iekiy

O. ciZte`b cYqb

me c_g Kvμgi mgm`v PíYZ Kiv ev D`iK` iBaviY KiZ nq| ØZxq chvq
 mgM Kvμgi Rb` ciKíbv cYqb KiZ nq| D`iK` ARbi Rb` Kx Kx KiZ
 nte, tKvüU iKfve, Kx `teq, Klb KiZ nte-G meB ciKíbv \_vK| Z`
 msMn AbmÜbgjK KvRi GKü, iZcY`i| cvBgwi ev tmtKÜwi Drm nZ
 Z` msMn KiZ nte| PZ\_ chvq Z` iekiy I djvdj cYqb KiZ nte|
 me`kl iKy\_v\_x máY AbmÜbgjK KvRi Dci GKü ciZte`b cYqb Kite|

13. iKlb- tKlvbn Kvμg máYK KqKüU K_v

iKlb-tKlvbn c×iZ I tKšj A`bK ai`bi| Gi KqKüU iKfK`K Ges
 KqKüU iKfV_x`K| iKlb-tKlvbn ciμq iKfV_xi mμq AskMnY
 iKfVjvf mnvqK| me c×iZiB Kg`ek meav I Amieav AvQ| Ggb tKvbn
 c×iZ ev tKšj tbB thüU mKj iKfV_xi Rb` mgfve Dc`hMx ev me ai`bi
 ielqe`i Rb` Dc`hMx| iKfK`K iefb c×iZ I tKšj Dci `VZv Ges tkY
 I cv Dc`hMx c×iZ I tKšj h_vh_ cqvMi Dci iBfi Kti iKfV_xi iKlb
 mvdj`| Ggb tKvbn eva`evaKZv tbB th GKüU cv ciPvjbv iKfK`K GKüU
 c×iZi Dci iBfi KiZ nte| cvK djcm Kivi Rb` iKfK`K ci`Z Abmvi
 GKwaK c×iZ I tKšj msigkY iRi gtZv Kti cv ciPvjbv KiZ cvib|
 cvi mvdj` iBfi Kti iKfK`K iEPYZv, ielqÁb I iKlb c×iZi h_vh_
 cqvMi Dci GRb` ejv nq iKfKB m`vrKó c×iZ| iKfV_x`K iKlb-
 tKlvbn c×iZ eüea| GLvb gvî KqKüU iKfV_xmμq c×iZ m`f`c Dc`vcb
 Kiv ntv| Zte iKfK`K AwaK msL`K c×iZ I tKšj Dci `VZv _vK
 cqvRb| Zvnj iZib th t`f` th c×iZ Dc`hMx Zv cqvM KiZ cvib|
 cqvRb GKwaK c×iZi msigkY iRi gtZv Kti cv ciPvjbv KiZ cvib|
 cv ciPvjbv mgq iKfK`K h` eStZ cvib th cqvMKZ c×iZ iKy_v_x`i
 iKlb djcm n`Q bv ZLb iZib c×iZ cieZb KiZ cvib| Zv iKfK`K eü
 c×iZi Dci `VZv \_vKv Avek`K|

14. iKy_v_x gj`vqb

maviY A` iKy\_v\_xi gj`vqb ntv iKy_v Kvμg t`K iKy_v_xi ARbi gvî
 iBvq Kiv| A_vr iKy_vμg D`jLZ ce iBawiZ iKlbj iKy_v_xi KZUv ARb
 KtiQ Zv iBicYB iKy_v_xi gj`vqb| h` I gj`vqb K\_vüi i`Z A`bK
 e`vck| Avgiv iefb mgq bvbvfe iKy\_v\_xi gj`vqb Kti _vK| gj`vqbi mgq
 I aib iefebvq iKy_v_xi gj`vqb cavBZ `B aviv: (K) MvKvxb ev aviewnK
 gj`vqb Ges (L) mvgóK gj`vqb| Avgiv cv PjvKvxb ev iB`ó cv`vsk t`K
 iKy_v_xi ARb gj`vqb Kti \_vK| G gj`vqb aviewnK ev MvKvxb gj`vqb|
 Avei Avgiv iB`ó mgq tktl ev Kvμg tktl mvgqK cixv, ewiK cixv,
 GmGmm cixv BZ` cixvi gva`g gj`vqb Kti \_vK| G ai`bi gj`vqb nj

მვგროK გჯ"ვqბ| ავიეწK I მვგროK Dfგ ავიი გჯ"ვqბiB cჟqRb AvჟQ|
Zჟე ავიეწK გჯ"ვqბi , iჰZ AჰbK ჟეK| KviY-

- ავიეწK გჯ"ვqბi გვა"გ ოkŷv_xi ოPოYZ ოkLb `ejZv ZvrŷოYK ოbჰ`kbv
c`vჰbi ოviv ოbivgggJk e`e`v ოbIqᵛ ოvq|
- ოkŷv_xi ოvჰZ-Kjგ e`enოIK KᵛR Kivi cოᵛqᵛ ოჟეჷჰYi გვა"გ გჯ"ვqბ Kჰi
ოbჰ`kbv ო`Iqᵛ ოvq|
- ოkŷv_xi ოეჰkl ოKQ `ŷZv, ოhgb- ოkᵛbv, ejv, cov BZ`ო` Kg ოგჰq, Kg
LiჰP I ოnჰR cოigᵛ Kჰi აჟc აჟc ოbჰ`kbv ო`Iqᵛ I ოbivgggJk e`e`v
ოbIqᵛ ოvq| მვგროK გჯ"ვqბi გვა"გ AჰbK ოŷჰÎ Gme `ეიკჰó"i გჯ"ვqბ Kiv
ოჟე ოq ოv|
- ოkŷv_xi Avჟემq ო`Kᵛgn ოეჰkl Kჰi e`ო³K I მვგოRK AvPiY Ges
გჯ"ჟეა cZ`ŷ ოჟეჷჰYi გვა"გ გჯ"ვqბ Kჰi ოbჰ`kbv ო`Iqᵛ ოvq|
- G გჯ"ვqბi გვა"გ ოkŷK Zvi e`eüZ ოkLb ოkLᵛbv c×იZ I ოKჰkჰji
h_v_Zv I djcmZv ოbaviY Kჰi ev `ejZv ოPოYZ Kჰi cჟqRbᵛq cოieZb
AvბჰZ cᵛიb|

15. ავიეწK გჯ"ვqბ

ავიეწK გჯ"ვqბi გვა"გ ოkŷv_xi `ejZv ოPოYZ Kჰi ოbჰ`kbv ო`Iqᵛ ოvq Ges
cჟqRბb ოbivgggJk e`e`v ოMnY Kiv ოvq|

evsjᵛჰ`ჰk 6ô ო`ჰK 10g ოkოY ოჰš ობოjოLZ `BოU ოŷჰÎ ავიეწK გჯ"ვqბ
Kᵛᵛᵛᵛ Pjჟე|

1. ოეIqᵛიἘK eოeἘq I გჰbᵛcოkR ოŷჰÎi ავიეწK გჯ"ვqბ

2. Avჟემq ოŷჰÎi ავიეწK გჯ"ვqბ

15.1. ოეIqᵛიἘK eოeἘq I გჰbᵛcოkR ოŷჰÎi ავიეწK გჯ"ვqბ

- ოეIqᵛიἘK ოეIqᵛიἘK eოeἘq I გჰbᵛcოkR ოŷჰÎi ავიეწK გჯ"ვqბ
Kiჟეb
- cიZოU ოელჰq ავიეწK გჯ"ვqბi Rb` eivἘKZ ბოი 20%

cიZოU ოელჰq ავიეწK გჯ"ვqბi ოŷÎ I ბოი eἘb :

ოŷÎ	ბოი
K. ოkოYi KᵛR	10
L. eოoi KᵛR I AbmÜvbgJk KᵛR	05
M. ოkოY Afᵛŷv	05
ტᵛოU	20

cიZ ოელq ოkŷK KZK -- ოელჰq cიZ ოkŷv_xჰK 20% ბოიი ოfiἘჰZ
ავიეწK გჯ"ვqბ Kჰi ოbawiZ QჰK გჯ"ვqბ ოiKW ოsiŷY Kiv ოჟე|

15.1.1. ოkოYi KᵛR

- ოkLb-ოkLᵛbv Kᵛᵛᵛᵛ PjᵛKᵛjᵛb ოkŷv_x KZK ოაóᵛ`Z ოეZᵛq KᵛR ოkოYi
KᵛR ოnᵛჟე ოეჟეPZ| ოელჰჰ` ოkოYi KᵛRi აიჰ ZviZg`_ოKჰZ cᵛი|
AოKᵛsk ოŷჰÎB cჰki DἘi ejv ev ოjLv, AvKᵛ (ოPÎ/Qოე, ოvიოY, გᵛბოPÎ,
ოjLvოPÎ), AvჰjᵛPbv I ოეZჰK AskMnY, PოiÎ-Aᵛfbq, e`enოIK KᵛR-G
აიჰbi ოე ოKQB ოkოYi KᵛR| evsjᵛ I BჰიოR ოელჰq ოkᵛbv, ejv, cov, ოjLv
BZ`ო` ოkოYi KᵛR ოnᵛჟე ოეჟეPZ ოჟე|
- cიZოU ოელჰqi Rb` cიZ ოვᵛqჰK ოZბოU ოkოYi KᵛRi გჯ"ვqბ ოiKW ოsiŷY Kiv
ოჟე| ოჟე ოელჰq e`enოIK KᵛR AvჟQ (ოeÁᵛb, c`v_ოeÁᵛb, ოvqᵛb, RᵛeἘÁᵛb,
KოIᵛkŷv, ოnᵛ`ოeÁᵛb, kᵛიოIK ოkŷv I ᵛ`ᵛ, Kg I RᵛebgLᵛ ოkŷv BZ`ო`)
ოჟე ოელჰq GKოU e`enოIK KᵛR I `óU ოkოYi KᵛRi ოiKW ოvLv ოჟე|
- ოელqᵛkŷK KZK ოbqᵛZfᵛჟე cჰZ`K ოkŷv\_xჰK გჯ"ვqბ Kiv ოჟე Ges cიZ `B
გᵛᵛᵛ GKᵛi Kჰi cიZ ოვᵛqჰK (Qq გᵛᵛᵛ) 3ᵛi გჯ"ვqბ ოiKW ოsiŷY Kiv
ოჟე|

15.1.2. ewoi KvR

- $\text{ik}^{\text{y}}_{\text{v}_x}$ ewoiZ $\text{ik}^{\text{y}}_{\text{v}}\mu\text{g}$ f $\ddot{\text{E}}$ K th KvR, tjv m $\acute{\text{a}}\text{ú}$ b K $\ddot{\text{t}}$ i ZvB ewoi KvR | ewoi KvR $\text{ik}^{\text{y}}_{\text{v}_x}$ GKKfv t e m $\acute{\text{a}}\text{ú}$ b Ki t e GUvB cZ v ikZ | $\text{ik}^{\text{y}}_{\text{K}}$ $\text{w}^{\text{b}}\ddot{\text{O}}$ Z n t eb th, $\text{ik}^{\text{y}}_{\text{v}_x}$ GKvB KvR U m $\acute{\text{a}}\text{ú}$ b K $\ddot{\text{t}}$ i t Q | ewoi KvRi gva t g $\text{ik}^{\text{y}}_{\text{v}_x\text{i}}$ P^{Sb} y^{Zv} Ges e v ³K AvPiY I gj t eva gj v qb Kiv n t e | ewoi KvR gj v qb K $\ddot{\text{t}}$ i $\text{ik}^{\text{y}}_{\text{K}}$ $\text{ik}^{\text{y}}_{\text{v}_x\text{t}}$ i t K c t qvRb x q ikLb mnvqZv v^{t} eb | $\text{ik}^{\text{y}}_{\text{v}}\mu\text{tgi}$ ikLbdtji Pwn v i Dci $\text{f}^{\text{f}}\ddot{\text{E}}$ K $\ddot{\text{t}}$ i $\text{ik}^{\text{y}}_{\text{K}}$ ewoi KvR v^{t} eb |
- j $\ddot{\text{y}}$ ivL t Z n t e ewoi KvR thb $\text{ik}^{\text{y}}_{\text{v}_x\text{t}}$ K gL v Kivq DrmwnZ bv K $\ddot{\text{t}}$ i | ewoi KvR Ggb n t Z n t e thb $\text{ik}^{\text{y}}_{\text{v}_x\text{i}}$ P^{Sb} y^{Zv} w^{E} KvK Ges mRbkxjZv cKv t ki m t hM v tK |
- $\text{t}^{\text{K}}\text{YKt}^{\text{y}}$ AvRZ avYvmgn P^{Sb} I Kv t R c t qvM Kivi m t hM thb ewoi Kv t R v tK | ewoi KvR thb $\text{ik}^{\text{y}}_{\text{v}_x\text{t}}$ K mRbkxj c t ki c v WZ t Z m v nv h K $\ddot{\text{t}}$ i $\text{t}^{\text{m}}\text{v}^{\text{t}}$ K v i Z v^{t} Z n t e | $\text{ik}^{\text{y}}_{\text{v}}\mu\text{g}$ g v U t ikLb $\text{t}^{\text{K}}\text{Lvtbv}$ Kv h μg Kjv t g c v $\ddot{\text{E}}$ ewoi KvR bgbv w nmv t e AbmiY Kiv t^{t} Z c v i |
- c v Z U w^{E} t qi ewoi KvR, tjv Ggb n t e hv $\text{ik}^{\text{y}}_{\text{v}_x}$ 20-25 $\text{w}^{\text{g}}\text{v}^{\text{t}}$ U i g t a v m $\acute{\text{a}}\text{ú}$ v b Ki t Z c v i | $\text{ik}^{\text{y}}_{\text{K}}$ c v Z m v g v q t K $\text{t}^{\text{K}}\text{v}$ Y t Z c t qvRb x q mSL v K ewoi KvR v^{t} eb | Z t e $\text{t}^{\text{K}}\text{W}$ msi y t Yi Rb v I $\ddot{\text{O}}$ t t K A $\acute{\text{O}}$ g $\text{t}^{\text{K}}\text{v}$ Y t Z w^{E} Avb, e v t j v^{t} v K I w^{E} c v iPq, Z v I t^{h} M v t hM ch v ³, Kg I R v ebg Lx $\text{ik}^{\text{y}}_{\text{v}}$ Ges K v i q vi $\text{ik}^{\text{y}}_{\text{v}}$ w^{E} t q c v Z m v g v q t K v^{t} U ewoi Kv t Ri gj v qb I $\text{t}^{\text{K}}\text{W}$ msi y Y Kiv n t e | I $\ddot{\text{O}}$ t t K A $\acute{\text{O}}$ g $\text{t}^{\text{K}}\text{v}$ Yi Ab v b w^{E} t qi Rb v 3 U ewoi Kv t Ri gj v qb I $\text{t}^{\text{K}}\text{W}$ msi y Y Kiv n t e | beg I v^{t} kg $\text{t}^{\text{K}}\text{v}$ Y t Z H v v QK w^{E} lq Q v ov mKj w^{E} t q c v Z m v g v q t K v^{t} U ewoi Kv t Ri gj v qb I $\text{t}^{\text{K}}\text{W}$ msi y Y Kiv n t e | $\text{t}^{\text{K}}\text{W}$ msi y t Yi Rb v m t ev v P b a i c v b ewoi KvR, tjv t K w^{E} tePbv Ki t Z n t e | $\text{ik}^{\text{y}}_{\text{K}}$ th $\text{t}^{\text{K}}\text{v}$ bv b a t i ewoi KvR v^{t} Z c v t ib | Z t e G t Z c v b b a i t K 5 Gi g t a v c v b b a t i i c v t S i K $\ddot{\text{t}}$ i $\text{t}^{\text{K}}\text{W}$ msi y Y Ki t Z n t e | i c v t S i t i ci fMsk b a i t j fMsk b a i w nmv t e msi y Y Ki t Z n t e |

15.1.3. AbmÜvbgjK KvR

AbmÜvbgjK Kv t Ri gva t g $\text{ik}^{\text{y}}_{\text{v}_x\text{i}}$ m g m v m g vavb y^{Zv} Ges P^{Sb} y^{Zv} w^{E} KvK N t U | AbmÜvbgjK Kv t Ri Rb v K t qK N E v t t K K t qK v^{t} t bi c t qvRb n t Z c v i | $\text{ik}^{\text{y}}_{\text{K}}$ w^{E} lq U w^{E} baviY K $\ddot{\text{t}}$ i t v^{t} eb |

w^{E} baviZ avc AbmiY K $\ddot{\text{t}}$ i AbmÜvbgjK KvR m $\acute{\text{a}}\text{ú}$ b Ki t Z n t e | I $\ddot{\text{O}}$ t t K A $\acute{\text{O}}$ g $\text{t}^{\text{K}}\text{v}$ Y ch t š m g m v P^{v} Y Z Kiv, c v iK v bv cYqb I Z v msM t ni ch t eY Y Ujm/ w WDj/c K gvjv cYqb $\text{ik}^{\text{y}}_{\text{K}}$ K $\ddot{\text{t}}$ i v^{t} eb | Z v msMn AbmÜvB Kv t Ri GK U t g t JK v^{E} k $\acute{\text{O}}$ hv $\text{ik}^{\text{y}}_{\text{v}_x}$ w^{E} t Riv m $\acute{\text{a}}\text{ú}$ b Ki t e | Z v msMn hZ v i m a e $\text{ik}^{\text{y}}_{\text{v}_x\text{i}}$ c v ievi, c v Z t ek v Ges w^{E} bKU GjvKvq m g v v v ivL t Z n t e | Z v msM t n $\text{ik}^{\text{y}}_{\text{v}_x\text{i}}$ w^{E} bivc E vi w^{E} lq U w^{E} tePbvq ivL t Z n t e | Z v msM t n $\text{ik}^{\text{y}}_{\text{v}_x}$ thb w^{E} eZKi Ae v q bv c t o $\text{ik}^{\text{y}}_{\text{K}}$ Zv w^{E} t $\text{O}}$ Z Ki t eb | w^{E} Avb w^{E} lqmg t ni Rb v Z v msMn M^{t} elYvM v t i cix y t Yi gva t g n t Z c v i | AbmÜvbgjK KvR v i t i m g M c v μ q w^{E} Kfv t e m $\acute{\text{a}}\text{ú}$ b Ki t Z n t e $\text{ik}^{\text{y}}_{\text{K}}$ Zv w^{E} S t q v^{t} eb |

c v Bg v i I t^{t} t K Ü v i Drm n t Z Z v msMn Kiv hv t e | $\text{ik}^{\text{y}}_{\text{v}_x}$ Z v w^{E} t kl t Yi gva t g djvdj cYqb Ges djvd t ji Dci gZvgZ v^{t} eb | m g M Kv h μ t gi Dci GK U c v Z t e v b iPbv Ki t Z n t e | c v Z t e v t b m $\acute{\text{a}}\text{ú}$ b Kv t Ri eYbv v K t e | c v Z t e v cYq t bi w^{E} t v kbv $\text{ik}^{\text{y}}_{\text{K}}$ v^{t} eb | AbmÜvbgjK KvR $\text{ik}^{\text{y}}_{\text{v}_x\text{i}}$ v jMZfv t e m $\acute{\text{a}}\text{ú}$ b Ki t e | Z t e Z v w^{E} t klY, djvdj cYqb, djvd t ji Dci gZvgZ c v b Ges w^{E} t c v U cYqb $\text{ik}^{\text{y}}_{\text{v}_x}$ GKKfv t e m $\acute{\text{a}}\text{ú}$ b Ki t e | G Kv t Ri gj v qb n t e GKK gj v qb | beg I v^{t} kg $\text{t}^{\text{K}}\text{v}$ Y t Z $\text{ik}^{\text{y}}_{\text{v}_x\text{i}}$ $\text{ik}^{\text{y}}_{\text{t}}$ Ki b v Zg m v nv h w^{E} t q AbmÜvbgjK KvR m $\acute{\text{a}}\text{ú}$ b Ki t e | $\text{ik}^{\text{y}}_{\text{K}}$ th $\text{t}^{\text{K}}\text{v}$ bv b a t i t Rb v AbmÜvbgjK KvR v^{t} Z c v t ib | Z t e G t Z c v b b a i t K 5 Gi g t a v c v b b a t i i c v t S i K $\ddot{\text{t}}$ i $\text{t}^{\text{K}}\text{W}$ msi y Y Ki t Z n t e | i c v t S i t i ci fMsk b a i t j fMsk b a i w nmv t e msi y Y Ki t Z n t e |

15.1.4. tkY Afxyv

ciZU Aa'vq tkI tkY Afxyv tblqv nte| Zte AaK baicvB Afxyvi bai tiKW iVLv nte| tkY Afxyvi DEicI kyv_xK t'Levi ci tdiZ wbtq msiYY Kiv nte| thme wltq e'enwiK KVR AvQ Hme wltq 'OU e'enwiK I GKU wjLZ Afxyvi tiKW msiYY Kiv nte| Ab'vb' wltq wZbU wjLZ Afxyvi tiKW iVLv nte| e'enwiK KvRi gj'vqbi gvb'E tkYtZ ma'u'Z e'enwiK KvRi Abic nte| tkY Afxyv wjLZ ev e'enwiK nte| ciZU tkY Afxyv 'i mgq tblqv nte| wltqi Rb' wbaWiZ KvM wciqW tblqv nte| wbaWiZ GK KvM wciqWi Awi³ mgq tblqv hte bv| tkY Afxyvi w'b tkYi Ab'vb' wciqWi vfwK KvRKg h_vixZ Pje|

16. AvteMxq tyti avivwnK gj'vqb

kyvmtg kyv_xi e'³K Dbqbi Dci , iZ Avivc Kiv ntqQ| GKRb kyv_x ia tgavex ntjB nte bv ZvtK fvtjv gvbli ntZ nte| fvtjv gvbli , Yvej ARb KiZ nte| GKRb kyv_x fvtjv gvbli Kbv Zv RvbtZ ntj Zvi AvPiY I 'ofw/2 gj'vqb KiZ nte| avivwnK gj'vqbi gva'tg kyv_xi e'³K AvPiY I mvgwRK gj'teva gj'vqb Kiv nte| w'vjtg kyv_x'i AvPiY I mvgwRK gj'teva tKvfbv GKU NUbv ev Bm' w'tq ZrvYvYKfvte gj'vqb Kiv hvq bv| w'vjtg kyv_x tkYi KvRi cvkvwk ciZibqZ eu KgKvE AskMnY KiZe| G,tjv ntjv 'wbK mgvtek, tLjvajv I μov, mvs'ZK Kvμg, kyv mdi I ci'kb, RvZxq w'em D'hvcb, agxq Abdvb, wAvb tgjv, MvYZ Awj'auqW, etqR 'vDum, MvjMvBW, wGbmwm Ges ciitek msiyyi Kvμg BZ'w' | kyv_x'i w'fb KgKvEi ga' w'tq 'xN chteyyi gva'tg Zv'i AvPiY I gj'teva ma'u'K GKU wbfithvM' gj'vqb Avmv hvq| kyvmtg AvteMxq tyti wKLbdj gj'vqbi AvLzvq Avbv ntqQ| G tyti th , Yvej I gj'teva ciigvci AvLzvq Avbv ntqQ tm,tjv nj- wbgvbeZZv, t'k'cg, tbZZ, mZZv, k'Ljv, mnthwMZv, mμq AskMnY, mnöZv, mPZbZv I mgqvbeZZv| tkYkyK Ab'vb' wltqkyKi mv_ ciqk Kti AvteMxq tyti gj'vqb KiZe I tiKW msiyy KiZe|

17. mvgwK cixyv I cvejK cixyv

RvZxq kyvmg 2012 Gi wbt'kbv Abmvti w'vjtg kyvel Qq gme'vcx 'OU mvgwK fvM Kiv nte| ciZ Qq gvfm GK mvgwK wnmte ciZ kyv eQti 'OU mvgwK cixyv AbiöZ nte| ciZ mvgwK cixyv tkI avivwnK gj'vqb cvB baiK GKwZ Kti 'OU mvgwK cixyv cvB bai Ges avivwnK gj'vqb cvB bati mgstq ciZ kyv_xi cieZx D'PZi tkY ev Kvμtg DbxZ Kivi wltq wtePbv Kiv nte|

mvgwK Ges cvejK cixyi ckcI cYqb Ges DEicI gj'vqb mRbkxj ckcxiZi wbt'kbv Abmvti msMvZ nte| kyv e'li iitZ wltqkyK carb wkyKi mv_ ciqk Kti kyvmtg c'E Aa'vqmgnK 'OU mvgwKi Rb' eEb KiZe| w'vjtg KvM'e'tmi ciigvYi Dci wfiE Kti Aa'vqmgnK mvgwK eEb KiZ nte| c_g mvgwK gj'vqbKZ Aa'vqmgnK wZxq mvgwK gj'vqbi Rb' e'envi Kiv hvte bv| Zte Aóg I 'kg tkYi cvejK cixyi (JSC, SSC) Rb' GB wbt'kbv cthvR' bq| wltqkyK tm Abmvti cv Kvμg ciPjv KiZe| mvgwK tkI **Abtöq cixyv kyvmtg wltq Ges cti Rb' eivIKZ cY bati nte| kyvmg i'ciLvi wltqKvvgv wltqi cYbai t'lv AvQ|**

mRbkxj ckcxiZi ckcI 'B aibi ck_vKte| GKU nt'Q euibevPib ck Ges AciiU nt'Q mRbkxj ck| euibevPib ckcI wZb aibi euibevPib ck_vKte| G,tjv nt'Q mvaviY euibevPib ck, euc'x mgwβMPK euibevPib ck Ges Awfb Z'wfiEK euibevPib ck| euibevPib ckcI wPsb 'yZvi Pvi 'tii ck AvbcwZKvti_vKte| mKj Aa'vqK cixyi AvLzvf³ KiZ nte| ckcI cYqbi cte wbt'kK QK 'Zvi KiZ nte| ciZU mRbkxj ctk GKU D'ixck_vKte Ges D'ixckKi mv_ 4U ck_vKte| ck 4U w'tq wPsb 'yZvi PviU (Avb, Abaveb, ctqM Ges D'PZi 'yZv) hvPvB Kiv nte| bai c'vb wbt'kKv AbmiY Kti DEicI gj'vqb KiZ nte|

«kÿvµg Dbqþb ms«kó KigU

1. RvZxq «kÿvµg mgšq KigU		
µgK	bvg I c`ie	KigUþZ c`ie
1.	W. Kvgj Ave`j bñmi tPšaix mPe, «kÿv gšYvjg, ejsjv`k mPevjg, XvKv	mfvciZ
2.	DcPvh, RvZxq «ekie`vjg, MvRci	m`m`
3.	W. KvRx LjxKšvvgb Avg` tPqig`vb, ejsjv`k Dbqb ciil` I mfvciZ, ejsjv`k A_bmZ mvgZ	m`m`
4.	hM-mPe (gva`gK), «kÿv gšYvjg, ejsjv`k mPevjg, XvKv	m`m`
5.	gnvciPvjK, gva`gK I D`Pikÿv Aia`Bi, XvKv	m`m`
6.	gnvciPvjK, RvZxq «kÿv e`vcbv GKvšWgx, avbgU, XvKv	m`m`
7.	gnvciPvjK, ejsjv`k KwiMri «kÿv Aia`Bi, AvMvMvI, XvKv	m`m`
8.	ciPvjK, AvBBAvi, XvKv «ekie`vjg, XvKv	m`m`
9.	cþdmi tgv tgv`dv KvgvDvİb tPqig`vb, RvZxq «kÿvµg I cV`c`K teW, XvKv	m`m`
10.	tPqig`vb, gva`gK I D`Pgva`gK «kÿvteW, XvKv	m`m`
11.	tPqig`vb, ejsjv`k KwiMri «kÿvteW, XvKv	m`m`
12.	tPqig`vb, ejsjv`k gv`imv «kÿvteW, XvKv	m`m`
13.	m`m` («kÿvµg), RvZxq «kÿvµg I cV`c`K teW, XvKv	m`m`
14.	cþdmi W. gnvš` Rvdi BKej iefvMq cavb, KšvúDvri mþqY GÜ Bvšbqis iefvM, kvRvjv ieAvb I chv <sup>3</sup> «ekie`vjg, mþjU	m`m`
15.	W. tgv tQvİKi ingvb cv ³ b Aa`vck I ciPvjK, «kÿv I MþeIYv Bb ÷UDU XvKv «ekie`vjg, XvKv	m`m`
16.	Aa`vck W. tgv AvLZvišvgvb Bmjvþgi BvZnm I mš`Z iefvM, XvKv «ekie`vjg, XvKv	m`m`
17.	Aa`vck kvxb gvneev Kexi BšvİR iefvM RvñšvibMi «ekie`vjg, mfvvi, XvKv	m`m`
18.	m`m` (cv`gK «kÿvµg), RvZxq «kÿvµg I cV`c`K teW, XvKv	m`m`
19.	m`m` (cV`c`K), RvZxq «kÿvµg I cV`c`K teW, XvKv	m`m`
20.	ckİ ciPvjK, GmBGmWic, gva`gK I D`Pikÿv Aia`Bi, «kÿv feb, XvKv	m`m`
21.	Dc mPe (gva`gK), «kÿv gšYvjg, ejsjv`k mPevjg, XvKv	m`m`

2. cþdkbvj KigU		
µgK	bvg I c`ie	KigUþZ c`ie
1.	cþdmi tgv tgv`dv KvgvDvİb tPqig`vb, RvZxq «kÿvµg I cV`c`K teW, XvKv	mfvciZ
2.	gnvciPvjK, gva`gK I D`Pikÿv Aia`Bi, XvKv	m`m`
3.	gnvciPvjK, RvZxq «kÿv e`vcbv GKvšWgx, avbgU, XvKv	m`m`
4.	ciPvjK, AvBBAvi, XvKv «ekie`vjg, XvKv	m`m`
5.	gnvciPvjK, ejsjv GKvšWgx, XvKv	m`m`
6.	gnvciPvjK, BmjvµgK dvDþÜkb ejsjv`k, XvKv	m`m`
7.	Rbve gbRiþj Avnmvb ejej cavb mšv`K, `ekvLx tUvjvfvkþj jvgþUW, XvKv	m`m`
8.	ckİ ciPvjK, GmBGmWic, gva`gK I D`Pikÿv Aia`Bi, «kÿv feb, XvKv	m`m`
9.	tPqig`vb, gva`gK I D`Pgva`gK «kÿvteW, XvKv I mfvciZ, ejsjv`k Avšt teW mgšq mve KigU	m`m`
10.	tPqig`vb, ejsjv`k gv`imv «kÿv teW, XvKv	m`m`
11.	tPqig`vb, ejsjv`k KwiMri «kÿv teW, XvKv	m`m`
12.	Aa`vck Avšjvn Ave mvqš` ciPvjK, «ekmwnZ` tKv, XvKv	m`m`
13.	W. tgv tQvİKi ingvb cvgkK, GmBGmWic, gva`gK I D`Pikÿv Aia`Bi, XvKv	m`m`
14.	Aa`vck Kvdi Dİxb Avnþg` cvgkK, cv`gK «kÿvµg DBs, GbimiUre, XvKv	m`m`
15.	cþdmi gnvš` Avjx cv <sup>3</sup> b m`m`, «kÿvµg, GbimiUre, XvKv (emv-šmBKš-tgvfm 8g Zjv (cİdg), 6/9, eK-m, jvjgUqv, XvKv-1207	m`m`
16.	Wxb, PviKjv Abl`, XvKv «ekie`vjg, XvKv	m`m`
17.	cþdmi mvjgv AvLZvi AvBBAvi, XvKv «ekie`vjg, XvKv	m`m`
18.	Aa`k, «kÿvK cİkÿY KþjR, XvKv	m`m`
19.	m`m` («kÿvµg), RvZxq «kÿvµg I cV`c`K teW, XvKv	m`m`
20.	cavb «kÿvK, MvþgvU j`veþiUvi nvB`j, avbgU, XvKv	m`m`
21.	Rbve tgvkZvK Avnþg` fBqv «eZİY vþqšK, RvZxq «kÿvµg I cV`c`K teW, XvKv	m`m`-mPe

3. †UKİbK`vj KİgİU		
µİgK	bvg I c`İe	KİgİU†Z c`İe
1.	c†dmi †gvt Ave`j ReŸvi cİ³b cİiPvjK, bİ†qg, XİKv (eİİo bs-7, mOK bs-11, †m±i bs-4, DĖİv g†Wj UİDb, XİKv-1230)	AvneİqK
2.	Aa`İcK W. Ave nİİg` jİZd mcİi İbDgİİ Aa`İcK, AİBBAİi, XİKv İekİe`İvjq, XİKv	m`m`
3.	c†dmi Ave`m menİb cİ³b gİvcİiPvjK, cİ_İgK İkİİv Aİa`İi (İm-8, eİmv bs-52, †İİW bs-6/G, aİbgİŰ AveİİmK G jİKv, XİKv)	m`m`
4.	Aa`İcK W. †Mvjİg İmj İgqİ cİ³b Aa`İİ, İUPİm †Uİİbs K†jR, XİKv (eİmv bs-47, †İİW bs-02, †m±i-09, DĖİv g†Wj UİDb, XİKv-1230)	m`m`
5.	W. †gvt İQİİKi İngİb cİvgkK GmBGmİWİc, gİa`İgK I D`Pİkİİv Aİa`İi, İkİİv feb, XİKv	m`m`
6.	c†dmi W. †gvt bİRgİ Kİİg †Pİaİx e`e`İcbİ İefİM, XİKv İekİe`İvjq, XİKv	m`m`
7.	W. Aİā j gİ†jK Aa`İcK, AİBBAİi, XİKv İekİe`İvjq, XİKv	m`m`
8.	Rbİe †gİvİqİ` RİKİ †İvİmb İkİİvµg İe†kİĀ GmBGmİWİc, GbİmİUİe, XİKv	m`m`
9.	Rbİe kİvİxbİv İeMg İe†kİĀ, GbİmİUİe, XİKv	m`m`
10.	Rbİe †gvt †gİL†jİm Dİ İngİb İe†kİĀ, GbİmİUİe, XİKv	m`m`
11.	Rbİe †gvt dİİv`j Bİmjİg EaİZb İe†kİĀ, GbİmİUİe, XİKv	m`m`-mİPe

4. †fİUs KİgİU		
µİgK	bvg I c`İe	KİgİU†Z c`İe
1.	evsjv	1. Aa`İcK Ave`jİv Ave mİqİ` cİiPvjK, İekmİvİnZ` †Kİ, XİKv 2. c†dmi bİRİvİb İeMg Aa`İİ, mİKİİ İeĀİb K†jR, XİKv
2.	Bİ†İİR	1. c†dmi Ave`m menİb cİ³b gİvcİiPvjK, cİ_İgK İkİİv Aİa`İi, XİKv (İm-8, eİmv bs-52, †İİW bs-6/G, aİbgİŰ AveİİmK G jİKv, XİKv) 2. c†dmi †gvt kİgmİ nK cİ³b Wİb, evsjv`k Dİ†İ İekİe`İvjq, MİRİcİ (eİmv bs-25, GİvcİU†gİU-İe-5, †İİW bs 68G, İ jİvİb-2, XİKv-1212)
3.	MİYZ	1. c†dmi W. †gvt Aİā j gİZb MİYZ İefİM, XİKv İekİe`İvjq, XİKv  2. c†dmi W. †gvt Aİām Qİgİv` MİYZ İefİM, XİKv İekİe`İvjq, XİKv
4.	İeĀİb	1. c†dmi W. †gvt AİİRRİ İngİb c`İ_İeĀİb İefİM, XİKv İekİe`İvjq, XİKv 2. Rbİe †gİvİqİ` b†İ Aİjg İmİİKİ mİ†İvİMİ Aa`İcK, AİBBAİi, XİKv İekİe`İvjq, XİKv
5.	evsjv†`k I İekcİİPq	1. c†dmi W. nİİab Dİ İİk` İvİİeĀİb İefİM, XİKv İekİe`İvjq, XİKv 2. W. İmq` nİİdRİ İngİb mİ†İvİMİ Aa`İcK, cİİ†ek İeĀİb İefİM Rİvİİİbİmİ İekİe`İvjq, mİfİvİ, XİKv
6.	Z` I †İvİMİ†İvİM chİ³	1. c†dmi W. gİvİqİ` Rİdİ Bkeİj KİİİDUİvİ mİ†qİ GŰ BİĀİbqİİİİ İefİM kİvİRİvjİ İeĀİb I chİ³ İekİe`İvjq, İm†jİU 2. Rbİe †gvt mİdDİ Aİjg Lİb mİKvİİ Aa`İcK, Z` chİ³ BİİUİUDU, XİKv İekİe`İvjq, XİKv
7.	cİİ†ek cİİİPİZ	1. c†dmi W. G Gİ Gİ gİKİm` Kİgİj fZĖ İefİM, XİKv İekİe`İvjq, XİKv 2. c†dmi W. †gvt LexİDİİb cİİ†ek İeĀİb İefİM, Rİvİİİbİmİ İekİe`İvjq, mİfİvİ, XİKv

5. **wkÿvµg Dbqb KwgwU**

weAvb		tkvY: lô- Aóg
μgK	bvg l c`we	KvgUz c`we
1	c†dmi W. kvnRvnb Zcb cv ³ b Aa`vcK, AvB.B.Avi, XvKv vekwe`vjq, XvKv 25/W, †jK WbF †ivW, †m±i-7, DĖiv, XvKv	AvnevqK
2	W. Avjx AvmMi Aa`vcK, B÷ l †q÷ BDıbfvııU, XvKv	m`m`
3	Rbve bvRgb bvnvi kvnxb carb †kŸK, †k†i eisjv bMi ewjKv D"P we`vjq, XvKv	m`m`
4	Rbve jvBjb bvnvi mnKvix carb †kŸK, †fKvııbmı bb ıj GŰ K†jR, XvKv	m`m`
5	Rbve Avnmvb Dj`vn mnKvix †kŸK MeY†gU j`ve†ıUıı nvB ıj, XvKv	m`m`
6	Rbve bwdm Lvbg ııııbqi †kŸK, nııjμm ewjKv D"P we`vjq, XvKv	m`m`
7	Rbve ı`jxc Kgi †fŸgK mnKvix †kŸK, †mıU †MMix D"P we`vjq, XvKv	m`m`
8	Rbve †gvt †gvL†jm Di ıngvb we†klÁ, GbıııUıe, XvKv	m`m`
9	Rbve †gvnvŸ` RvıKi †nv†mb KvııKjvg we†klÁ, GmBGmıWıc, GbıııUıe, XvKv	m`m`
10	Rbve Rvgvj Ave`j bv†mi KvııKjvg we†klÁ, GmBGmıWıc, GbıııUıe, XvKv	mgŸqKvix

weAvb		tkY: beg-`kg
μwgK	bvg I c`we	KrgvUzZ c`we
1	c†dmi W. kvnRvnb Zcb c ^{v3} b Aa`vcK, AvB.B.Avi, XvKv wekwe`vj q, XvKv 25/W, †jK WbF †ivW, †m±i-7, DËiv, XvKv	AvneqvK
2	W. Avjx AvmMi Aa`vcK, B÷ I†q÷ BDvbfvmmU, XvKv	m`m`
3	Rbve jvBjb bvnvi mnKvix cavb wk†K, wfKvibvbm vb bb`cj GÛ K†jR, XvKv	m`m`
4	Rbve bwdmv Lvbg vmbqi wk†K, nvj μm evjKv D"P we`vj q, XvKv	m`m`
5	Rbve w`jxc Kgv† fsgK mnKvix wk†K, †mU †MMix D"P we`vj q, XvKv	m`m`
6	Rbve †gvnvq` RvKi †nvmb KviKjvg we†kIÁ, GmBGmWic, GbimvUie, XvKv	m`m`
7	Rbve Rvgvj Ave`j bv†mi KviKjvg we†kIÁ, GmBGmWic, GbimvUie, XvKv	mgšqKvix

c`v_eÁvb		tkY: beg-`kg
µgK	bvg l c`ve	KvgU±Z c`ve
1	c±dmi W. kvRvnb Zcb Aa`vcK (Ae.) AvBBAvi, XvKv vekiekie`vjq, XvKv 25/W ±jK WvBf ±ivW, tm±i-7, DĖiv, XvKv	AvnevqK
2	W. Avjx AvmMi Aa`vcK, c`v_eÁvb efvM, B÷ l±q÷ BDıbfwmıU, XvKv	m`m`
3	c±dmi W. Ave`j gvbvb tPšaix c`v_eÁvb efvM, Rvni½xibMi ekie`vjq, mvfvi, XvKv	m`m`
4	Rbie tnjvj Drİb cfvIK, icbMi g±Wj ıj GŰ K±JR, ıgici, XvKv	m`m`
5	Rbie tgv±tgvL±jm Di ingvb ıe±kIÁ, GbıııUıe, XvKv	m`m`
6	Rbie tgvnvş` RvKi tn±mb KvıiKjvg ıe±kIÁ, GmBGmıWıc, GbıııUıe, XvKv	mgšqKvix

imvqb		†kɹY : beg-`kg
μvgK	bvg l c`we	KwguU†Z c`we
1	c†dmi W. bxjdvi bɹnvi imvqb wefvM, XvKv wekie`vj q, XvKv	AvnevgK
2	Rbve †gvnɹɹ` b†i Avjg mwIKx mn†hvMx Aa`vcK, AvBBAvi, XvKv wekie`vj q, XvKv	m`m`
3	Rbve GmGg ekxiDjvn mnKvix cwiPvjK, gvDik, †kyvfeb, XvKv	m`m`
4	Rbve AwjDjvn †gvt AvRgZMxi mn†hvMx Aa`vcK, imvqb wefvM, XvKv K†jR, XvKv	m`m`
5	Rbve we`r Kgvi †Nvl cfvIK, i†cbMi g†Wj †j GŨ K†jR, †gici, XvKv	m`m`
6	W. †gvt BKejv †n†mb KwiKjvg we†klÁ, GmBGmWic, GbimwUie, XvKv	mgšqKvix

RveÁvb			†kY beg-`kg
µgK	bvg I c`e	KigU#Z c`e	
1	c†dmi †gt Bg`v`j nK D™`veÁvb †efvM, XvKv †ekve`vj q, XvKv	AvneqK	
2	Aa`vcK W. †bqigj b†mi cYve`v †efvM, XvKv †ekve`vj q, XvKv	m`m`	
3	Rbve nvg`v AvLZvi mnKvix Aa`vcK, miKwi †ZZgxi K†jR, XvKv	m`m`	
4	Rbve gC`g`wiK cfvIK, i†cbMi g†Wj`j GŮ K†jR, †gici, XvKv	m`m`	
5	Rbve m†v†v Avn†g` M†eIYv KgKZv, Gb†miUie, XvKv	m`m`	
6	Rbve i†gx†Rm†gb KwiKjvg †e†kIÁ, GmBGm†W†c, Gb†miUie, XvKv	mgšqKvix	

6. mveK mgšq KigU		
µgK	bvg I c`e	KigU#Z c`e
1.	Rbve †g†v†v` RwiKi ††v†mb KwiKjvg †e†kIÁ I GmBGm†W†c †dvKj c†qU KwiKjvg †W†fj c†gU BD†bU RvZxq †k†vµg I c†V`c`K †eW, XvKv	mveK mgšqKvix
2.	Rbve †g†kZvK Avn†g` fBqv †eZiY †bqšK RvZxq †k†vµg I c†V`c`K †eW, XvKv	mveK mgšqKvix

wkÿvµg

weÁvb

lô - Aóg †kwY

f_wgKv

gbe mf"Zvi weKvk I AMMIZ Z weÁvb I chl³i cfve µgvmZ ew× cvt"Q| weÁvb GLb m³ú³ ntqtQ Átbi weifb tÿtÎ GgbK gvbweK weIq,tjvtZI | weÁvb ïa hwšK Ksev Z_ "
I DcvÊ msMn bq| GuU GKIU e"vcK I Mfxi Kgaviv| weÁvb GKIU gvbweK KgKvÊ Ges gvbems"Zi Acivnh Ask| Rxeþbi weifb tÿtÎ thgb, KIL, kík, Ptkrmv, Mn wbgvY,
thvMtþvM I Z " weibgg, wibvcËv, cwitek msiÿY, m³½Z Ges tLjajvnm me wKQZ chl³i e"envtji tçQþb iqtQ weÁvþbi Ae`vb|

eZgib gva'ngK 7i i weÁvb 1kÿvµg Dbqb Kiv n4q|Qj 1996 mv7j | GB 1kÿvµgi cavb `ejZv nj : GB 1kÿvµg weÁvbi Z\_ I ZtË fvivµvS, GLv7b weÁvbi cYv ^eÁwBk c1µqv I weÁvbmaS Z `ófi½ weKv4ki e'vcviU A7bKUv Ae7n7jZ| d7j 1kÿKMY nv7ZKj7g KvR ev weÁvbi c1µqv c1Z 7Rvi bv 7`7q, 1kÿv\_x7`i gL_ we`vq Drmw7nZ Ki7Qb, 1kÿv\_xiv gL\_ K7i fvj ba i 7c7q cvm K7i hv7Q, 1KŠ Kg`ÿZvmaúv g1vemaú` 7nmv7e ^Z7i n7Q bv | GQvov c1q 16 eQi c7e cY7Z 1kÿvµgi A7bK 1KQB ci7bv n7q 7M7Q Ges h7Mv7c7hvMx weÁvb 1kÿvi Rb` Abch³ n7q c7o7Q|

Ió-Aóg tḱwYi weÁvb ṽkÿvμtg ṽkÿv_#`i h‡Mvc†hvMx eÁvb ṽkÿvq ṽkÿZ K‡i †Zvjvi Rb” weÁvb‡bi Aa‡bK Ávb I ^eÁwbK cμqv‡i mv‡\_ c‡iPZ Kivi D‡`VM MnY Kiv n‡q‡Q|
Gi gva’tg ṽkÿv_xiv weÁvb‡bi wefb †ÿ†Îi ZweĚK Ávb AR‡bi cvkvck nv‡Z Kjtg Kv†Ri `ÿZv (weÁvb‡bi cμqv) I weÁvbm‡ŕZ `wóf½ AR‡bi m‡hvM cv†e| Ges GKB mv‡_ cieZx D’P tḱrY†Z weÁvb‡bi Aa’g‡bi Rb” Dch³ wfvĚ K‡i Mto Zi†e|

beg I `kg tkwi Yi weÁvb wkÿvµg tm mKj wkÿv\_xt`i Rb` cYqb Kiv ntqTQ hviv mpeZ weÁvb wkÿv wksew weÁvbK tckv wntmte MnY Ki#e br| ZIb weÁvbi GKU mǎúY aviYv t`evi Rb` weÁvb wkÿvµtg Rxe RMr, t#šZ I e<sup>-</sup>RMr, ciitek RMr Ges chw<sup>3</sup>MZ weKvkK weÁvb wkÿvi cavb wLbtyî wntmte we#ePbv Kiv ntqTQ| weÁvbi we#fb kvLvK mnR#eva, Avb>`gq, mRbkxj, gvbweK A#fhvb i#c Dc⁻vc#bi cqvm tbiqv ntqTQ| weÁvbi ZÈ I m#i ZiweK we#kIY bv K#i cvZ⁻wnK Rxe#b Gi e`envi Ges G msikó mvgwRK weIqK AwaKZi , i#Z t`Iqv ntqTQ| G#Z wkÿv_xiv GKw`K Rxe#bi mv#\_ weÁvbi mǎúK L#R c#e I weÁvb wkÿvi cvm1/2KZv Dcjä Kivi m#hvM cv#e| GKB mv#\_ weÁvbi AšibwnZ tmš`h I gvbweK Av#e`b Dcjä Ki#Z cvi#e| weÁvb PPvi gva`tg wk¶v_xiv thb weÁvbgbg@, Kms⁻ig³ I D`vi g#bv#v#cb nq wkÿvµg Zvi Dci h\_vh\_ , i#Z Av#ivc Kiv ntqTQ| beg I `kg tkwi Yi wkÿv xt`i weÁvbi Ávb I ciµvq mv#\_ ciwPZ K#i GKU weÁvbgbg@ mgvR Mto tZvivi Rb` weÁvb wkÿvµtg we#fb c#Póv tbiqv ntqTQ|

1. Džik

1. cKizi bvbv e⁻ I Nubvi mvt₋ ciiPZ nIqv Ges G, tji ciz AbmÜrm I tKšZnjx nIqv |
2. vek RMtZ msNiuZ weifb Nubvi tCQ#bi KviY (Reason behind) Dcjä Kiv |
3. weÁvbi weifb týtîi aviYv, mî, bxiZ, I ZË mautK Ávb ARb Ges tmB m½ t jLiPî, mviY, cZxK, Pî, bKkv, gtWj Ges fvlvq Zv cKv#k `ý nIqv |
4. ^eÁvbK cµqv I cixýY c×Z (Scientific Process and Experimental Method) PPvi gva'tg mRbkjZv (Creativity), hvPB Kivi `ýZv (Critical thinking skill) I mgm'v mgva#bi `ýZv (Problem Solving Skill) ARb Kiv |
5. weÁvbi e'enwiK , iZ Dcjä Kiv Ges weifb hšbgvY I ch³ i weKv#k weÁvbi bq'tgi KvKviZv Abaveb Kiv |
6. Rxbhvîvi gvb Dbq#b weÁvbi Ávb, `ýZv I `ófi½ e'envi Kiv |
7. weÁvbi PPvi gva'tg e"³MZ I mvgwRK wivcËv weavb Ges weifb cZKj Ae⁻ v t₋tK DËitY c'tqRbxq Rxb`ýZv I `ófi½ ARb mýg nIqv |
8. weÁvb PPvi AšwbnZ tms`h I Avb` Dcjä Kiv |
9. weÁvbi weKvkgvb I cieZbkj aviv Dcjäi gva'tg Rxebe'vcx wkývq AvMnx nIqv |
10. weÁvb PPvi gva'tg weÁvbgb®, Kms⁻ig³ I thš³K PŠvi AwaKvix nIqv |

2. cwiŠK wLbdj

eixEëxq

1. tŕšZ I e⁻ RMr

- AbmüÜrm `wóZ tŕšZ RMŕZi wfb e⁻ I NUbv chëÿÿi gra'tg eYbv KiŕZ cviŕe|
- tŕšZ weÁvŕbi aviYv, mÎ, bxZ I ZËi AvŕjvK e⁻ I NUbvi KvKviY mûK vcb KiŕZ cviŕe|
- e⁻i `eikó", bvgKiY, tkYiefvM I MvB webvm Ges ewnK cfvŕe Gŕi cwieZb weŕKIY KiŕZ cviŕe|
- `eÁwbK cµqv I cixÿY c×Zi mvinth" tŕšZ weÁvŕbi wfb NUbv, mÎ, bxZ Ges ZË hvPvB KiŕZ cviŕe Ges Rxeŕbi e⁻e tÿŕÎ cŕqM KiŕZ cviŕe|
- weÁvŕbi wfb tÿŕÎ AvRZ Ávb I `ÿZvK tŕLwPÎ, mviY, cZxK, wPÎ, bKkv, gŕWj Ges fvlvq Zv cKvk KiŕZ cviŕe|

2. cwi_ex Ges gnvKvk

- gnvKŕki wfb e⁻i cwiPq I Zvŕi MvZ cKvZ eYbv KiŕZ cviŕe|
- gnvŕŕki we⁻Z Ges gnvŕŕki wfb e⁻i cwiPq, Gi DrciË I cwiYvZ e⁻vLv KiŕZ cviŕe|
- tmŕi RMŕZi we⁻vZ, Dcv`vb Ges Zvŕi cwiüiK mûK e⁻vLv KiŕZ cviŕe|
- cwi_exi DrciË, MvZ I djvdj Ges KŕÎg Dcmŕni Kvµg weŕKIY KiŕZ cviŕe|

3. Rxe RMr

- RxeRMŕZi tkYwebvm, ewnK I Af`šixY MvB, kvixieËxq KvhcYvjx, cwiüiK wbfikxjZv Ges A_wbZK , iŕZ weŕKIY KiŕZ cviŕe|
- `eÁwbK cµqv I cixÿY c×Zi mvinth" RxeRMŕZi wfb NUbv, Gŕi MvB, kvixieËxq KvhcYvjx chëÿÿ Ges weŕKIY KiŕZ cviŕe|
- Rxe RMŕZi wfb tÿŕÎ AvRZ Ávb I `ÿZvK wPÎ, bKkv, gŕWj Ges fvlvq cKvk KiŕZ cviŕe|

4. Avgvŕi cwiŕek

- cKvZMZfvŕe cwiŕŕki fvimvg" iÿvi cKqv e⁻vLv KiŕZ cviŕe|
- RxeWePÎ" Ges ev`ms`vŕbi Dcv`vbmŕni gŕa" mûK vcb KiŕZ cviŕe|
- ewnK KvŕY mó cwiŕŕki fvimvg`nxbZv e⁻vLv KiŕZ cviŕe|
- cwiZZ Ae⁻vi cwiŕcÿZ fvimvg" iÿv Kivi c×Z eYbv KiŕZ cviŕe|

gŕbvŕcŕkR

- hšcviZ I DcKiY mwbcyfvŕe e⁻envi Kŕi `eÁwbK cµqv I cixÿY Kvµg mûv`b KiŕZ cviŕe|
- tŕLwPÎ, mviY, cZxK, wPÎ, bKkv A½b Kŕi weÁvŕbi aviYv, mÎ, bxZ, gŕWj Ges ZË cKvk KiŕZ cviŕe|

AvŕeMxq

- Rxeŕbi mKj KgKvÊ `eÁwbK `wów½, Kms`vig³Zv Ges gj`ŕevŕai jvjb I Zvi cwiZdjv NUbZ cviŕe|
- weÁvb PPvi AšwbnZ tmŕ`h I Avb` Dcŕä I Zvi cKvk NUbZ cviŕe|
- weÁvŕbi weKvkgvb I cwieZbkj aviv Dcŕäi gra'tg Rxebe`vcx wkyvq AvMn cKvk Kiŕe|

3. cviŠK wLbdj i tkwYw fĖK wfvRb

i fĖK cviŠK wLbdj		
Iô tkwY	mBg tkwY	Aóg tkwY
c_g Aa"vq : ^eAwbK cμqv Ges cwigc wLYdj : 1. ^eAwbK cμqv I cixY c×Z e"envi K+i AbmÜvb I mgm"v mgyab Kvμg cwiPvjbv Ki+Z cvi+e 2. cwigv+ci mnRj f" DcKiY I hš e"envi K+i weAw+bi t+fZi wK cwigc Ki+Z cvi+e 3. tgsijK i wkmgn+K GKK Øviv cKvk Ki+Z cvi+e	c_g Aa"vq : wba tkwi Rxe [AYRxe, QİvK I ^kev j] wLbdj : 1. AYRxei wefb ^ek+ó"i Ici wfiĖ K+i G+ i tkwYKiY Ki+Z cvi+e 2. gybeRxe+ b AYRxei DcKwiZv I AcKwiZvi e"vL"v Ki+Z cvi+e 3. AYRxe Kxfv+e gybe+`n c+ek K+i Zv e"vL"v Ki+Z cvi+e 4. Kxfv+e msμgY cwiZ+iva Kiv hvq Zv e"vL"v Ki+Z cvi+e	c_g Aa"vq : cvwYRM+Zi tkwYeb"vm wLbdj : 1. A+gi+Ėx cvYxi tkwYeb"vm Ki+Z cvi+e 2. tgi+Ėx cvYxi tkwYeb"vm Ki+Z cvi+e
wØZxq Aa"vq : Rxe RMr wLbdj : 1. cavb cavb ^ek+ó"i Av+jv+K RxeRM+Zi tkwYKiY Ki+Z cvi+e 2. mc@úK Ges Ac@úK Dm+` i tkwYKiY Ges cv_K" Ki+Z cvi+e 3. mvariY ^ekó" Abhvqx tgi+Ėx Ges A+gi+Ėx cvYxi g+a" cv_K" Ki+Z cvi+e	wØZxq Aa"vq : Dm+` I cvYxi tKvIxq msMVb wLbdj :</b> 1. cvYx Ges Dm+` tKv+li Zjbv Ki+Z cvi+e 2. wefb cKvi Um"i KvR e"vL"v Ki+Z cvi+e 3. cvYx I Dm+` tKv+li cavb A½Ymg+ni MVb Ges KvhcYvjx e"vL"v Ki+Z cvi+e 4. wefb cKvi Um"i tgsijK KvR e"vL"v Ki+Z cvi+e 5. A½ I Z+ši cv_K" e"vL"v Ki+Z cvi+e	wØZxq Aa"vq : Rxe e"× I eskM+Z wLbdj : 1. tKvI wfvR+bi cKvi+f" e"vL"v Ki+Z cvi+e 2. tμv+g+Rvg, wGbg Ges wRb Gi m+úK eYbv Ki+Z cvi+e 3. tKvI wfvR+bi gva+g Rxe t`ni e"× e"vL"v Ki+Z cvi+e 4. cvYxi eskM+Zi aviv i+yvq tKvI wfvR+bi fvgKv e"vL"v Ki+Z cvi+e
ZZxq Aa"vq : Dm+` I cvYxi tKvIxq msMVb wLbdj :</b> 1. cvYx Ges Dm+` i tKv+li g+a" wgj Ges Awgj e"vL"v Ki+Z cvi+e 2. cvYx I Dm+` tKv+li cavb cv_K" Kvix Askmg+ni wP+ýZ wPÎ A½b Ki+Z cvi+e	ZZxq Aa"vq : Dm+` i ewn"K ^ekó" wLbdj : 1. i/cvšiZ gj, KvĖ Ges cvZvi MVb ^ekó" e"vL"v Ki+Z cvi+e 2. i/cvšiZ gj, KvĖ Ges cvZvi KvR e"vL"v Ki+Z cvi+e	ZZxq Aa"vq : Awf"eb Ges c+`b wLbdj :</b> 1. Dm+` i cwb tkwY cμqv e"vL"v Ki+Z cvi+e 2. Dm+` Kxfv+e t`n n+Z cwb cwiZ"vm K+i Zv e"vL"v Ki+Z cvi+e

İrfiĖK cwiĖK wLbdj		
Iô tkwY	mBg tkwY	Aóg tkwY
Iô Aa"vq : mste`x A½</b> <b>wLbdj :</b> <ol style="list-style-type: none"> <li>1. bvK, tPvL, wRnYv, ZK Ges Kvþbi KvR e"vL"v KiþZ cviþe </li> <li>2. mste`x A½ e"envi Kþi ^eAwbK cixY Y I chþeY Y Kxfvþe Kiv hvq Zv c`kb KiþZ cviþe	Iô Aa"vq : c`vþ_i MVb</b> <b>wLbdj :</b> <ol style="list-style-type: none"> <li>1. c`vþ_i MVb e"vL"v KiþZ cviþe 2. AY I cigvYi gþa" cv_K" KiþZ cviþe 3. tgšjK, thšMK Ges wggk c`vþ_i gþa" cv_K" KiþZ cviþe </li> <li>4. cZxK Ges mstKZ e"envi Kþi wbevPZ tgšjK Ges thšMK c`v_ wPlyZ KiþZ cviþe 5. chvq mviwYi cv_wgK aviYv eYbv KiþZ cviþe 6. cixYvi mrvnþh" tgšjK c`v_ nþZ thšMK c`v_ c"Z KiþZ cviþe	Iô Aa"vq : cigvYi MVb wLbdj 1. cigvY gþWþji MVb e"vL"v KiþZ cviþe 2. cigvYieK msL"v, fi msL"v, AvbwK fi e"vL"v KiþZ cviþe 3. thvRbx I mstKZ e"vL"v KiþZ cviþe 4. Avqb Kxfvþe mwó nq Zv e"vL"v KiþZ cviþe 5. K"vUvqb Ges A"vUvqb Gi cv_K" KiþZ cviþe 6. AvBþmvUþci e"envi eYbv KiþZ cviþe 7. A"vUvqb Ges K"vUvqb e"envi Kþi iwmvqibK dgjv cYqb KiþZ cviþe 8. thvRbx e"envi Kþi mstKZ wByq KiþZ cviþe 9. wPÎ A½b Kþi wciwqWK tUreþji c_g 18wU tgþþji cigvY KvWvþgv e"vL"v KiþZ cviþe
mBg Aa"vq : c`vþ_i ^ewkó" Ges ewin"K cfve</b> <b>wLbdj :</b> <ol style="list-style-type: none"> <li>1. wefb ^ewkþó"i Ici wfiĖ Kþi c`vþ_i tkwYweb"vm KiþZ cviþe 2. c`vþ_i Ici wefb ewin"K cfve e"vL"v KiþZ cviþe	mBg Aa"vq : kw³i e"envi wLbdj : 1. kw³, KvR Ges ygZv Gþ`i gþa" cvi"úwK mþúK e"vL"v KiþZ cviþe 2. wefb cKvi kw³i i/cvšþi i NUbv e"vL"v KiþZ cviþe 3. bevqbþhvM" Ges AbevqbþhvM" kw³i gþa" cv_K" KiþZ cviþe 4. kw³ msKU wvimþb Ges cwitek msiYþY bevqbþhvM" kw³i cþqvRbxqZv e"vL"v KiþZ cviþe	mBg Aa"vq : cw_ex I gnvKI wLbdj : 1. gnvKI Ges AwfKþli cv_K" e"vL"v KiþZ cviþe 2. fi I IRþbi cv_K" KiþZ cviþe 3. AwfKIR ZiþYi cfvþe e"i IRþbi cieZb weþkly KiþZ cviþe

İİfİĖK cWŠK kLbdj		
Iô tkY	mBg tkY	Aóg tkY
Aóg Aa`vq : wgy</b> <b>kLbdj :</b> 1. wfb cKvi `eY c`Z KiþZ cviþe  2. wfb cKvi thþMi `eþY Zvcgvİvi cfve AbmÜvb KiþZ cviþe 3. meRxb `veK wntmþe cwbi e`envi c`kb KiþZ cviþe  4. `eY Ges mvmþcbkþmi gþa` cv_K` KiþZ cviþe 5. mg`Z Ges AmgmZ wgy c`Z Ges Dcv`vbmgn c_K KiþZ cviþe  6. jeYv <sup>3</sup> cwlb ntþZ jeþYi mlg ùwUK Ges weix cwlb c`Z KiþZ cviþe	Aóg Aa`vq : kþai K_v</b> <b>kLbdj :</b> 1. kþai `ekó` eYbv KiþZ cviþe  2. kþ mAvjb e`vL`v KiþZ cviþe  3. Kvb, Zij l evqeq gva`g kþai teþMi Zjbv KiþZ cviþe 4. cvYx Kxfvþe kþ İbþZ cvq Zv e`vL`v KiþZ cviþe 5. gvl Ges wefb cvYxi kve`Zvi mxgvi Zjbv KiþZ cviþe  6. kþ Drcv`bKvix hš AbmÜvb, ewo l Avþk cvþk kþ Drcv`bKvix hš wPyZ Kþi kþ mwóı KviY e`vL`v KiþZ cviþe	Aóg Aa`vq : imvqvıbK weımqv</b> <b>kLbdj :</b> 1. wfb cKvi imvqvıbK weımqv e`vL`v KiþZ cviþe  2. imvqvıbK weımqvi gva`g wfb cKvıi k <sup>3</sup> i İcvši e`vL`v KiþZ cviþe 3. imvqvıbK weımqvi gva`g e`i Ae`vi cıieZb e`vL`v KiþZ cviþe  4. İ@ tkvþli k ³ i İcvši e`vL`v KiþZ cviþe  5. Zıor weþklþYi aviYv e`vL`v KiþZ cviþe  6. fi msiýY bxıZ e`vL`v KiþZ cviþe
beg Aa`vq : Avþjvi NUbv</b> <b>kLbdj :</b> 1. Avþjvi mAvjb e`vL`v KiþZ cviþe  2. Avþjvi mAvjb, tkvıY Ges cıZdjb e`vL`v KiþZ cviþe  3. gmY l AgmYZþj Avþjvi cıZdjb e`vL`v KiþZ cviþe  4. Avþjvi cıZdjb Ges `cþY cıZıea mwó e`vL`v KiþZ cviþe 5. Avgv`ı Prıcvþk msNıvZ wefb NUbvq Avþjvi cıZdjbı e`vL`v w`þZ cviþe	beg Aa`vq : Zvc l Zvcgvİvi cfve</b> <b>kLbdj :</b> 1. Zvc l Zvcgvİvi gþa` cv_K` KiþZ cviþe  2. hš e`envi Kþi Zvcgvİvi cııgvc KiþZ cviþe 3. dvþibvBU Ges tmjwmqm t`þjı gþa` mwóK`vcb KiþZ cviþe  4. evqi Pvc l Av`Zvi Dci Zvþci cfve e`vL`v KiþZ cviþe 5. cıxýþYi mvrnþh` c`vþ_i Zvcxq mwómvıY c`kb KiþZ cviþe  6. Zvc mAvjþbi wefb cııqv e`vL`v KiþZ cviþe  7. weıKıK Ges tkvıþKı gþa` cv_K` KiþZ cviþe	beg Aa`vq : eZbx Ges Pjwe`r kLbdj : 1. Gıw Ges wıw cevþni aviYv e`vL`v KiþZ cviþe 2. Zıor cevn Ges wefe cv_þK`ı ga`Kvi mwóK tþLıPþİi mvrnþh` e`vL`v KiþZ cviþe  3. Zıor eZbxþZ tıva, wDDR Ges Pwei cþqvRbxqZv e`vL`v KiþZ cviþe  4. A`wgUvi l tþvëwgUvi e`envi Kþi eZbxı Zıor cevn Ges wefe cv_K` cııgvc KiþZ cviþe 5. mwıR l mgvšıvj eZbxþZ Zıor cevn Ges wefe cv_þK`ı wfbZv c`kb KiþZ cviþe 6. `e`ıwZK ýgZvi wmwıe KiþZ cviþe

İİfİĖK cWŠK kLbdj		
Iô İkY	mBg İkY	Aóg İkY
Øv`k Aa`vq : cİ_exİ DrcİĖ kLbdj : 1. cİ_exİ DrcİĖ NUbv eYbv KiİZ cviİe 2. cİ_exİ Af`ŠİxY MvB e`vL`v KiİZ cviİe </li> <li>3. P` , mh Ges cİ_exİ AvKvi e`vL`v KiİZ cviİe 4. fİgKáú mİóİ KviY e`vL`v KiİZ cviİe	Øv`k Aa`vq: İmŠİRMİZİ cİİİPİZ Ges cİ_exİ MİZ kLbdj : 1. İmŠİ RMİZİ MvB e`vL`v KiİZ cviİe 2. İmŠİ RMİZİ m`m`İ İİfŠZ `eİkó` Zjbv KiİZ cviİe 3. cİ_exİ NYİbi cfve Ges Gi dİj mó dİvdj e`vL`v KiİZ cviİe	Øv`k Aa`vq: gnvKvk İ DcMn kLbdj : 1. gnvKvk (Space) Ges gnvİeİki (Universe) avİYv e`vL`v KiİZ cviİe 2. Kİİg DcMn İvcİbi BİZnm e`vL`v KiİZ cviİe 3. DcMİni Kİcİ İ Pjvi MİZ e`vL`v KiİZ cviİe 4. cİKİZK Ges Kİİg DcMn e`vL`v KiİZ cviİe
<p>İİqv`k Aa`vq : Lv`` İ cİó kLbdj :</p> <ol style="list-style-type: none"> <li>1. Lv`` İ cİóİ cİqvRbİqZv e`vL`v KiİZ cviİe 2. İİfb Lv`` Dcv`vİbi KvR eYbv KiİZ cviİe </li> <li>3. mİg Lv``İ ZİİjKv c`Z KiİZ cviİe	<p>İİqv`k Aa`vq: cİKİZK cviİek İ `İY kLbdj :</p> <ol style="list-style-type: none"> <li>1. cviİeİki Dci `İİYİ cfve e`vL`v KiİZ cviİe 2. cviİeİki Dcv`vbmgn Kxfİİe `İİZ nq Zv İİekİY KiİZ cviİe	<p>İİqv`k Aa`vq: Lv`` İ cİó kLbdj :</p> <ol style="list-style-type: none"> <li>1. İİfb Lv``İ cİó_Y e`vL`v KiİZ cviİe 2. cİóİ AfveRİbZ İİvm İbYq İ cİZİİvİai Dcvq eYbv KiİZ cviİe 3. Pİvn`v Abİvq Lv`` İİeİPİb mİg nİe
PZ`k Aa`vq : cİİİeİki fİvmg` Ges Avgv`İ Rİeb kLbdj : 1. cİİİeİki Dcv`vbmgn e`vL`v KiİZ cviİe </li> <li>2. cİİİeİki fİvmg` İİYq cİİİeİki Dcv`vbmgnİ AvŠİmáÚK e`vL`v KiİZ cviİe	PZ`k Aa`vq: Rİevq cİİeZb İ İMb nvDR cİZİİqv kLbdj : 1. evqgİİj İ İİfb İ eYbv KiİZ cviİe 2. cİİİeİk cİİb, Aİ · İRb İ Kİeb Pİİİ , İİZ e`vL`v KiİZ cviİe 3. Avnİqv İ Rİevq e`vL`v KiİZ cviİe 4. DòZv eİİİ mİİ_Rİevq cİİeZİbi máÚK e`vL`v KiİZ cviİe 5. İMb nvDR cfve İ İMb nvDR cİZİİqv e`vL`v KiİZ cviİe 6. evqgİİj İMb nvDR M`İm eİİİ KviY e`vL`v KiİZ cviİe	<p>PZ`k Aa`vq : cİİİek Ges ev`ZŠ kLbdj :</p> <ol style="list-style-type: none"> <li>1. İİfb cKvi ev`ZŠ e`vL`v KiİZ cviİe 2. Lv`` Rİj İ Lv`` kİj e`vL`v KiİZ cviİe 3. ev`ZİŠ kİ<sup>3</sup> cevİ e`vL`v KiİZ cviİe </li> <li>4. cİİİeİki fİvmg` İİYq ev`ZİŠİ fİgKv İİekİY KiİZ cviİe

5. Aa˘vq ˘eb˘vm I mgq eÈb (Iô-Aóg)

Aa˘vqi µg	Iô tkY		mBg tkY		Aóg tkY	
	Aa˘vqi bvg	˘cwıqW msL˘v	Aa˘vqi bvg	˘cwıqW msL˘v	Aa˘vqi bvg	˘cwıqW msL˘v
c_g Aa˘vq	˘eÁmbK cıµqv Ges cıgıvc	9	˘ba tkıYi Rxe	9	cwYRMtZi tkıY˘eb˘vm	8
ØZxq Aa˘vq	RxeRMZ	10	Dı™˘ I cıYxi tKvıxq msMVb	10	Rtēi eı× Ges eskMıZ	12
ZZxq Aa˘vq	Dı™˘ I cıYxi tKvıxq msMVb	10	Dı™t˘ i ewıK ˘eıko˘	12	e˘vcb, Aıf ˘eb Ges ct˘˘b	9
PZ_ Aa˘vq	Dı™t˘ i ewıK ˘eıko˘	12	kmb	10	Dı™t˘ i eskeı×	10
cÁg Aa˘vq	mıjtıKmsıKıY	8	cııcıKZŠ Ges i ˘msenb ZŠ	10	mgŠq Ges ıbtmıY	12
Iô Aa˘vq	msıe˘x A½	10	c˘t˘ i MVb	12	cıgvıYı MVb	13
mBg Aa˘vq	c˘t˘ i ˘eıko˘ Ges ewıK cıve	10	kı ˘ i e˘envı	10	cı_ex I gıvıKı	10
Aóg Aa˘vq	ıgkY	10	kıāı K_v	9	ıvmıqıbK ˘eıµqv	8
beg Aa˘vq	Aıjtıvı NUbı	10	Zıv I Zıvcıvıv	10	eZbı Ges Pıje˘r	9
˘kg Aa˘vq	MıZ	11	˘e˘r Ges PııKı NUbı	11	Aı, ıvıK I jeY	8
GKv˘k Aa˘vq	ej Ges mıj hŠ	12	cııcıKk cııeZb Ges ˘eıfb NUbı	11	Aıjtıvı	10
Øv˘k Aa˘vq	cı_exı DrcıÉ	7	tmsıRMZ I Avgıı i cı_ex	8	gıvıKıv I DcMı	11
İıqv˘k Aa˘vq	Lı˘ I cıó	9	cıKıZK cııtek I ˘ıY	10	Lı˘ I cıó	8
PZ˘k Aa˘vq	cııııııı fıvmıv˘ Ges Avgıı i Rıeb	12	Rıevı cııeZb	8	cııııııı Ges eı˘ZŠ	12

6. Aa˘vq ˘eb˘vm I mgq eÈb (beg-˘kg)

Aa˘vqi µg	Aa˘vqi bvg	˘cwıqW msL˘v	Aa˘vqi µg	Aa˘vqi bvg	˘cwıqW msL˘v
beg tkY			˘kg tkY		
c_g Aa˘vq	DbZZı Rıebavıv	17	beg Aa˘vq	˘ııııııı mıı_emeıvı	14
ØZxq Aa˘vq	Rıetıı Rb˘ cııb	18	˘kg Aa˘vq	Gıııv ejıK Rııb	15
ZZxq Aa˘vq	ü˘hıŠı hZ K_v	16	GKv˘k Aa˘vq	cıZ˘ııK Rıetıb Rıechıı ˘	16
PZ_ Aa˘vq	beRıetıı mPıvı	14	Øv˘k Aa˘vq	Rıetıb Zııor	18
cÁg Aa˘vq	t˘LıZ nıj Aıjtıvı PıvB	15	İıqv˘k Aa˘vq	mıvB KıvıKııQ	14
Iô Aa˘vq	cııgvıı	13	PZ˘k Aa˘vq	Rıeb eıvııııı ıeAıvı	16
mBg Aa˘vq	Aı, ıvıı I jeıııı e˘envı	17			
Aóg Aa˘vq	Avgıı i mııı˘	13			
				tıvıU =	216

7. $w_k y_v \mu g \text{ QK}$ $l\hat{o} \dagger k_w Y$

c_g Aa'vq : ^eÁmbK cμqv Ges cīgvc (9 wciqW)

¶kLbdj	¶elqe	¶kLb-¶kLv¶bv ¶b¶`kbv	gj`vqb ¶b¶`kbv
e¶xeĖxq 1. ^eÁmbK cμqv Ges cixŷY e'vL'v Ki¶Z cvi¶e 2. ^eÁmbK cμqv avcmgn e'vL'v Ki¶Z cvi¶e 3. cīgvc¶ci c¶qvRbxqZv Ges GK¶Ki , i¶Z e'vL'v Ki¶Z cvi¶e 4. tgšjK I thšMK GKK e'vL'v Ki¶Z cvi¶e g¶bv¶cikR 5. ^`N", fi I mgq cīgvc Ki¶Z cvi¶e </p> <p>6. ¶e¶fb AvKv¶ii KvVb e`i AvqZb cīgvc Ki¶Z cvi¶e 7. Zij c`v¶_i AvqZb cīgvc Ki¶Z cvi¶e </p> <p>8. Zvcgvĭv cīgvc Ki¶Z cvi¶e </p> <p><b>Av¶eMxq</b></p> <p>9. cixŷY I AbmÜvbgjK Kvμ¶gi Z_ msM¶n mZZv, k•Ljv, ^ah I cŷcivZnxb AvPiY c`kb Ki¶Z cvi¶e	• ^eÁmbK cμqv Ges cixŷY Gi aviYv • ^eÁmbK cμqv avc • cīgvc¶ci c¶qvRbxqZv Ges GKK • tgšjK I thšMK GKK • ^`N", fi I mg¶qi cīgvc</li> <li>• ¶e¶fb AvKv¶ii KvVb e`i AvqZ¶bi cīgvc • Zij c`v¶_i AvqZb ¶bYq • Zvcgvĭvi cīgvc	civLwU ¶Kb eÜ nj Zvi KvY-LR¶Z Avgiv Kx Kie? • c_¶g t`Le ¶e`r Av¶Q ¶Kbv? • h¶` ¶e`r _¶K • Zvici t`Le mBP ¶VK gZ KvR Ki¶Q ¶Kbv? h¶` mBP ¶VK _¶K Zv¶j t`Le mB¶Pi Zvi ¶VKgZ msh³ ¶Kbv ?</li> <li>• ms¶hvM Zvi ¶VK _¶K¶jB ĩa d'vbiU L¶j t`Le • Avgiv ¶Kš c_¶gB d'vbiU Lje bv • KvY ¶e`r bv _¶K¶j d'vbiU Pj¶e bv </li> </ul> <p>G ck K¶i ¶k¶¶v_xi KvQ t_¶K DĖi LR¶eb  ¶k¶¶v_x¶`i DĖ¶ii avivewKZv h¶<sup>3</sup> ¶`¶q tevSv¶eb Ges G avivewK I h¶³h³ fv¶e KvR Kivi cμqv nj ^eÁmbK cμqv </p> <p>¶k¶¶v_xiv K¶qKwU ^eÁmbK cμqv D`vniY ¶`¶e </p> <p>¶k¶¶K Gici ^eÁmbK cμqv I cix¶¶iY avc ¶k¶¶v_x¶`i mvg¶b Dc`vcb Ki¶eb  GKwU cev¶Pĭ (Flow Chart) e`envi K¶i Dc`vcb Ki¶j fv¶jv nq </p> <ul style="list-style-type: none"> <li>• ^`b¶`b R¶e¶bi ¶e¶fb tKbvKvUv thgb, Pvj, tZj, Rgv Kvco BZ`w`i gvc ev cīgY t_¶K cīgvc¶ci aviYv e'vL'v Ki¶eb  ¶k¶¶v_x¶`i ¶R¶Ám Ki¶eb tZvgi Rgv KZUK j¶v ev GUv ^Z¶i Ki¶Z Kx cīgY Kvco jvM¶e ? • c¶Z`K ¶k¶¶v_xi nvZi gvc ¶fb ZvB nvZ ¶`¶q gvc¶j GKB ¶R¶b¶mi ^`N" G¶KK R¶bi Rb" G¶KK iKg n¶e  G aviYv t_¶K GK¶Ki c¶qvRbxqZv e'vL'v Ki¶eb  Gici ^`N", fi I mg¶qi GK¶Ki eYbv t`¶eb	• tKvYi Kv¶Ri ¶b¶`kK e`envi K¶i gj`vqb Ki¶eb </li> <li>• ewoi Kv¶Ri ¶b¶`kK e`envi K¶i gj`vqb Ki¶eb • e`enwiK Kv¶Ri ¶b¶`kK e`envi K¶i gj`vqb Ki¶eb

⚡Zxq Aa`vq : Rxe RMr (10 ⚡criqW)

⚡kLbd j	⚡elqe	⚡kLb-†kLv†bv ⚡b†`kbv	gj`vqb ⚡b†`kbv
⚡xeÊxq 1. Rx†ei cavb cavb `⚡kó` e`vL`v Ki†Z cvi†e 2. RxERM†Zi †k⚡Yieb`vm Ki†Z cvi†e	• Rx†ei cavb `⚡kó` • RxERM†Zi †k⚡Yieb`vm               <ul style="list-style-type: none"> <li>o g†biv</li> <li>o †cvU÷v</li> <li>o QÎvK</li> <li>o D⚡TM` - o cvYx	• ⚡kÿv_x †k⚡Y†Z RxERM†Zi `⚡kó` m⚡ú†K Zv†`i A⚡fÁZv eYbv Ki†e </li> <li>• e`vK†U⚡iqv, A`v⚡gev Gi PvU, `kev j, gvki:g/†h†Kvb QÎvK, gm, dvb I ⚡KQ mc@úK D⚡TM†`i bgbv ⚡b†q ⚡kÿK Kv†m Avm†eb  Ges `⚡kó` Q†K Dc`vcb Ki†eb Ges Zvi ⚡f⚡Ê†Z †k⚡Yieb`vm Ki†eb </li> <li>• ⚡kÿv_x ewoi KvR ⚡n†m†e Zvi GjvKvq/ ewoi A⚡fÁZbvq cvc` Rx†ei †k⚡Yieb`vm Ges `⚡kó` Q†K ⚡jicex Ki†e	• ewoi Kv†Ri ⚡b†`kK e`envi K†i gj`vqb Ki†eb
3. mc@úK D⚡TM†`i `⚡kó` e`vL`v Ki†Z cvi†e	• mc@úK D⚡TM` - o AveZexRx - o bMexRx	• mc@úK D⚡TM` m⚡ú†K ⚡kÿv_x A⚡fÁZv eYbv Ki†e </li> <li>• g⚡iP MvQ, bqbZviv ev †h†Kvb mc@úK D⚡TM` Ges m⚡BKv†mi PvU/⚡PÎ ⚡b†q ⚡kÿK †k⚡YK†ÿ Avm†eb Ges dj †`L†q G,†jvi `⚡kó` e`vL`v Ki†eb Ges AveZexRx I bMexRx D⚡TM` m⚡ú†K aviYv `†eb	
4. Ac@úK D⚡TM†`i `⚡kó` e`vL`v Ki†Z cvi†e	• Ac@úK D⚡TM`               <ul style="list-style-type: none"> <li>o `kev j - o QÎvK - o gm - o dvb	• ⚡kÿK †k⚡YK†ÿ `kev j, QÎvK, gm, dvb msMn K†i †k⚡Y†Z c`kb Ki†eb Ges G†`i `⚡kó` ⚡kÿv_x†`i Kv†Q Rv†Z Pv†eb • ⚡kÿv_xiv `jMZfv†e ⚡e`vjq K`v⚡úv†m/ ⚡bR GjvKvq Ac@úK D⚡TM` ⚡P⚡Y†Z Ki†e Ges †Kb G,†jv Ac@úK D⚡TM` Zvi KvY ⚡jL†e </li> <li>• ⚡kÿK Kv†m †Zjv†cvKv, cRvc†Z, d⚡os, †K†Pv, ⚡UK†U†K, e`vO BZ`v` PvU c`kb Ki†eb  Rx†ei ewn`K `⚡kó` LvZvq ⚡jL†Z ej†eb ⚡kÿv_x†`i DÊ†i i Av†jv†K ⚡kÿK †gi†`Êx I A†gi†`Êx cvYx m⚡ú†K aviYv `†eb • ⚡kÿ†Ki ⚡b†`kbv Abhvq ⚡kÿv_xiv ewo/GjvKvq A†gi†`Êx I †gi†`Êx cvYx msMn ⚡P⚡Y†Z Ki†e Ges cv_K` ,†jv †cv÷v†i Dc`vcb Ki†e	• †k⚡Yi Kv†Ri ⚡b†`kK e`envi K†i gj`vqb Ki†eb
5. A†gi†`Êx Ges †gi†`Êx cvYxi `⚡kó` e`vL`v Ki†Z cvi†e g†bv†c†kR 6. ⚡e`vj†qi Pv†cv†ki c⚡i†e†k Ae`Z Rx†ei †k⚡Yieb`vm K†i †cv÷v†i c`kb Ki†Z cvi†e Av†eMxq 7. Pv†cv†ki RxERMZ m⚡ú†K m†PZb n†e Ges gvbeRx†b Gme Rx†ei ,i†Z Dcj⚡ä Ki†Z mÿg n†e	• A†gi†`Úx Ges †gi†`Úx cvYxi `⚡kó`		• Aa`v†qi †k⚡Y Afxÿv mRbk†j ck cx⚡Z†Z Ab⚡ôZ n†e

ZZxq Aa`vq : DTM I cvYx i tKv l xq msMVb (10 vciqW)

vKLbdj	velqe	vKLb tKLv tbn vb`kbv	gj`vqb vb`kbv
evxeE_xq 1. tKv l evL`v Ki tZ cvi te  </p> <p>2. D<sup>TM</sup> I cvYx tKv tLi cv_K`Kvix carb ^eikó` evL`v Ki tZ cvi te	- DTM I cvYx tKv l - tKv l cvPxi - tKv l MnYi - cv ÷ W - vbDTM Kqvm	- tKv l m^u tK v_x t` i ceÁvb h<sup>u</sup> P<sup>u</sup> B Ki t<sup>u</sup> eb   Gici tKv l I tKv tLi Ave@vi m<sup>u</sup> tK v<sub>x</sub> t` i t^u eb - ikYK tKv YK tY DTM I cvYx tKv tLi P^u U Avb t^u eb I P^u U `U i g t<sup>u</sup> a` v g j A v g j , t j v t^u i K t^u i L v Z v q v j L t Z e j t^u eb - ikY_v xiv DTM I cvYx tKv tLi v P^u t^u t^u L G t^u i g t^u a` v g j A v g j , t j v L v Z v q v j t<sup>u</sup> L D c v c b Ki t<sup>u</sup> eb  </li> <li>ikY<sub>v</sub> xiv ` j M Z f v t^u e G K v U K t^u i tKv tLi A^{1/2} v b i v P^u t^u AsKb Ki t^u eb - Gici tKv b tKv b A^{1/2} v b DTM tKv tLi, tKv b tKv b A^{1/2} v b cvYx tKv tLi Ges tKv b A^{1/2} v Y DTM cvYx D f q tY t^u t^u D c v Z v i G K v U Z v j K v ^ Z v i Ki tZ ikY_v t` i vb` kbv t` t<sup>u</sup> eb	tKv i K v t<sup>u</sup> R i vb` k K e`envi K t<sup>u</sup> i g j`vqb Ki t^u eb
3. Rxe t` t n tKv tLi f i g K v evL`v Ki tZ cvi te	Rxe t` t n tKv tLi f i g K v	ikY_v x evoi K v R v n m v t^u e g v b e R x e t b tKv tLi f i g K v m^u tK v G K v U c v Z t^u e ` b ^ Z v i K t<sup>u</sup> i K v t m D c v c b Ki t<sup>u</sup> eb  </li> <li>ikY<sub>v</sub> t` i c v Z t^u e ` t b i A v t j v t K ikY K g v b e R x e t b tKv tLi f i g K v m^u tK v A v t j v P b v Ki t^u eb	evoi K v t^u R i vb` k K e`envi K t^u i g j`vqb Ki t^u eb
g t b v t c i k R 4. DTM I cvYx tKv tLi carb cv_K`Kvix A^{1/2} v b m g t n i v P^u t^u A^{1/2} v b K t^u i v P^u y Z Ki tZ cvi te			Aa`v t q i t k v Y A f x y v m R b k v j c k c x v Z t Z A b w o Z n t e
Av t e M x q 5. Rxe t` t n i b v b v K v h m t g tKv tLi Ae`vb D c j v ä Ki t^u eb			

PZ_ Aa'vq : DTM†`i e^{mn}ˆK ˆe^{ik}÷

(12 ˆc^{riqW})

ˆkLbdj	ˆelqe	ˆkLb †kLv†bv ˆb†`kbv	gjˆvqb ˆb†`kbv
e^{ixE}xq 1. DTM†`i e<sup>mn</sup>ˆK ˆe<sup>ikó</sup> eˆvLˆv Ki†Z cvi†e 2. gj†i cavb ˆe<sup>ikó</sup>, cKvi†fˆ Ges KvR eˆvLˆv Ki†Z cvi†e 3. Kv†Êi cavb ˆe<sup>ikó</sup>, cKvi†fˆ Ges KvR eˆvLˆv Ki†Z cvi†e	- mc@úK D<sup>TM</sup>†`i ˆe^{ifb} Ask gj - gj†i ˆe^{ifb} Ask - cKvi†fˆ - KvR KvÊ - Kv†Ûi ˆe^{ifb} Ask - cKvi†fˆ - KvR	- ˆkÿK DTMˆ m@úK ˆkÿv_x†`i ceÁvb hvPvB Ki†eb </li> <li>ˆkÿK Kv†m Avmvi mgq djmn GKU MvQ mv†_ ˆb†q Avm†eb, Mv†Qi ˆe<sup>ifb</sup> Ask †ˆvL†q Ask,†jvi bvg Rvb†Z PvB†eb Ges GKRb ˆkÿv_x†K bvg,†jv †ev†W ˆjL†Z ej†eb  Abˆvbˆ ˆkÿv_xiv Zv†`i LvZvq bvg,†jv ˆjL†e Gici ˆkÿK †ev†W Qie G†K Mv†Qi cˆZU Ask †ˆvL†q Gme A†ki ˆe^{ikó} I KvR eˆvLˆv Ki†eb - ˆkÿv_xiv GKU mc@úK DTM†`i ˆPÎ A†b K†i ˆe<sup>ifb</sup> A†ki bvg I KvR ˆjL†e </li> <li>ˆkÿK K†qKvU „Q gjh<sup>3</sup> (avb ev NvmRvZxq D<sup>TM</sup>ˆ) I GKU cavb gjh<sup>3</sup> D<sup>TM</sup>ˆ(giP, bqBZviv) Gi bgbv Kv†m ˆb†q Avm†eb </li> <li>ˆkÿK G ˆˆai†bi D<sup>TM</sup>†`i gj †ˆvL†q G†`i ˆe<sup>ifb</sup> Ask m@úK eˆvLˆv Ki†eb </li> <li>D<sup>3</sup> bgbv †ˆvL†q ˆkÿv_x†`i G ˆˆai†bi DTM†`i gj†i ˆPÎ G†K cv_Kˆ ˆjL†Z ej†eb </li> <li>ˆkÿK Avg, KvWj ev bvi†Kj mcwi Mv†Qi DˆvniY ˆ†q Avg KvW†ji mv†_ bvi†Kj mcwi Mv†Qi Kv†ði cv_Kˆ ˆkÿv_x†`i Kv†Q Rvb†Z PvB†eb - ˆkÿv_x†`i KvQ †_†K cvß DÊi,†jv †ev†W ˆjL†eb Gici †Kvb ai†bi Kv†Ûi Kx ˆe<sup>ikó</sup> Zv eˆvLv Ki†eb </li> <li>Gme ˆe<sup>ikó</sup>ˆi ˆfiÊZ ˆe<sup>ifb</sup> ai†bi Kv†Êi ˆPÎ †ˆvL†q cKvi†fˆ eˆvLv Ki†eb </li> <li>ˆkÿv_xiv ˆ ai†bi D<sup>TM</sup>†`i Kv†Êi cv_Kˆ LvZvq ˆjL†e Ges Dcˆvcb Ki†e - e^{moi} KvR ˆn†m†e Kv†Êi Mvb Abhvx ˆj ev e^{moi} Pvic†k AeˆZ DTMˆ,†jvi GKU ZˆjKv ˆZvi Ki†e	†kYi Kv†Ri ˆb†`kK eˆenvi K†i gjˆvqb Ki†eb </li> <li>e<sup>moi</sup> Kv†Ri ˆb†`kK eˆenvi K†i gjˆvqb Ki†eb

PZ_ Aa`vq : Dv`m`i evn`K`ekó`

(12 `criqW)

Pjgvb-2

`kLbdj	`elqe`	`kLb-`kLv`bv `b`kbv	gj`vqb `b`kbv
4. cvZvi cavb`ekó`, cKvi`f` Ges KvR e`vLv Ki`Z cvi`e </p> <p>5. Dv`m` Ges gybeRxe`b gj, KvÊ I cvZvi c`qvRbxqZv e`vL`v Ki`Z cvi`e </p> <p><b>Av`eMxq 6. Dv`m`i c`Z mnvbf`Zkxj AvPiY c`kb Ki`e	• cvZv o cvZvi `eifb Ask</li> <li>o cKvi`f`</li> <li>o KvR</li> </ul> </li> <li>• Dv`m` Ges gybeRxe`b gj, KvÊ I cvZvi c`qvRbxqZv	• ceeZx Kv`m `ky`K `eifb ai`bi cvZh³ Dv`m` c`ii Kv`m Avbvi Rb` `ky`v_x`i `b`kbv ``eb • Gi gta` Avg ev KvVvj cvZv t`L `ky`v_x`i `PÎ AvK`Z ej`eb, GKRB `ky`v_x tev`W I Ab`v`iv LvZvq `PÎ AvK`e  Gici D<sup>3</sup> `PÎ t`L`q `ky`K cvZvi `eifb As`ki mv`_ `ky`v_x`i c`iPq Ki`v`eb </li> <li>• bgbv Dv`m` t`L`q (Avg/KvVvj ev tZZj/KòPov) mij I th`MK cvZvi `ekó`i `f`E`Z cv_K` K`i t`Lv`eb </li> <li>• Ôc`i`e`ki Pwin`v Abhvqx gj, KvÊ I cvZvi c`qvRbxqZv`el`q GKU` `jMZ KvR tk`Y`Z m`ub Ki`e • cvZ`mK Rxe`bi Pwin`v tguv`Z gj, KvÊ I cvZvi c`qvRbxqZv`el`q GKU` `jMZ KvR tk`Y`Z m`ub Ki`e </li> <li>• `ky`v_xiv ewoi KvR mnv`e gj, KvÊ I cvZv Dv`m`i I gvb`li Rxe`b tKb c`qvRb Zv c`Z`e`b AvKv`i `j`L Avb`e Ges c`ZU` `j c`ii Kv`m Zv`i KvR Dc`vcb Ki`e Gici `ky`K `ky`v_x`i g<sup>3</sup> Av`jvPbv I c`Z`e`bi `f`E`Z gj, KvÔ I cvZvi c`qvRbxqZv e`vL`v Ki`eb • ÔDv`m`i c`Z Zvg Kxfv`e mnvbf`Zkxj AvPiY Ki`e G `el`q GKU` tcv`vi A`b Ki`e	• tk`Yi Kv`Ri `b`kK e`envi K`i gj`vqb Ki`eb • ewoi Kv`Ri `b`kK e`envi K`i gj`vqb Ki`eb </li> <li>• <b>Aa`vqi tk`Y Afx`yv mRbkxj ck c`x`Z`Z Ab`ôZ n`e

cÂg Aa`vq : mv#jvKms#kIY (8 wciqW)

wLbdj	welqe	wLb tKlv#bv wb`kbv	gj`vqb wb`kbv
e#xeE#q 1. D#TM` Kxfv#e Lv`` c`WZ K#i Zv e`vL`v Ki#Z cvi#e </p> <p>2. mv#jvKms#kIYi Dci RxeRM#Zi wbfik#jZv e`vL`v Ki#Z cvi#e  </p> <p><b>Av#eM#q</b></p> <p>3. Lv`` c`#Z D#TM#`i Ae`vb Dc#j#ä Ki#e Ges D#TM#`i cWZ ms#e`bk#j n#e	• mv#jvKms#kIY • mv#jvKms#kIY cWμqv Lv`` c`Z	• wkyK Kv#m wKQ meR cvZv wbtq Av#teb Ges cvZvi i0 tKb meR nq Zv e`vL`v Ki#eb cvZv th m#hi Av#jv tKvIY K#i Zv e`vL`v Ki#eb • mv#jvKms#kIY cWμqv tKv#iwdj, Av#jv, cwb I K#eb WvB A·vBW Kxfv#e Lv`` c`Z cWμqv f#gKv iv#L wkyK e`vL`v Ki#eb </li> <li>• wkyv_xiv`#ji Av#Obvi meR Nv#mi Dci GKwU BU Pvcv w`#q t#L hv#e  wKQ#b ci BU DvV#q Nv#mi eY ch#e#yY Ki#e Ges msMwVZ c#ieZb e`vL`v Ki#e </li> <li>• tKv#Z wkyv_xiv`jMZfv#e mv#jvKms#kIY cWμqv mg#KiY eK wP#t cKvk Ki#e • OmvQ tKb Av#jvi w`#K S#K hvq# G w#l#q GKwU cix#yY wkyv_x m#ub Ki#e </li> <li>• Og#b#li Rxe#b D#TM#`i Ae`vb# w#l#q GKwU cWZ#e`b wkyv_x ewo#Z`Z#i Ki#e	• tKvYi Kv#Ri wbt`kK e`envi K#i KvRwU gj`vqb Ki#eb </li> <li>• e`enwiK Kv#Ri wbt`kK e`envi K#i gj`vqb Ki#eb </li> <li>• ewoi Kv#Ri wbt`kK e`envi K#i gj`vqb Ki#eb • Aa`v#qi tKvY Af#y#v mRbk#j ck c#WZ#Z AbwôZ n#e

Iô Aa`vq : mste`x A½

(10 wciqW)

wkLbdj	welqe	wkLb-tkLv#bv wb`kbv	gj`vqb wb`kbv
eixEëxq 1. mste`x A½mg#ni KvR e`vL`v Ki#Z cvi#e </p> <p>2. cixY`Y I ch#eY`Y mste`x A½i e`envi c`kb Ki#Z cvi#e 3. mste`x A½i hZ tbiqvi tKškj e`vL`v Ki#Z cvi#e </p> <p><b>Av#eMxq</b></p> <p>4. mste`x A½i h#Zi weliq w#R m#PZb n#e I Ab`#K m#PZb Ki#e	mste`x A½i ciwPiZ               <ul style="list-style-type: none"> <li>ZK</li> <li>bvK</li> <li>wRnYv</li> <li>tPvL</li> <li>Kvb</li> </ul> </li> <li>mste`x A½i e`envi I hZ	- wkyK Kv#m jeY ev wPib wRnYvq w`uk K#i w` tKgb Rvb#Z PvB#eb, nv#Zi Pvgovq Avj#Zv K#i wPgU tK#U e`_vi Abf#Z Rvb#Z ej#eb, Kv# `nvZ w`#q tX#K kã bv tkv#v I L#j kã tkv#v, GKBfv#e tPvL eÜ K#i bv t`Lvi I tPvL L#j t`Lvi Abf#Z wkyv_x#`i Rvb#Z ej#eb wkyv_x#`i D#i cvIqvi ci mste`x A½i ciwPiZ Z#j ai#eb - wkyv_x GKKfv#e ZK, bvK I wRnYv, tPvL I Kv#bi KvR wjL#e - wkyK tev#W wPÎ G#K ev PvU t`wL#q ZK, bvK I wRnYv, tPvL I Kv#bi Mvb e`vL`v Ki#eb </li> <li>wkyv_x#`i `#j f#M K#i ZK, wRnYv, bvK I tPv#Li hZ Kxfv#e w#Z nq Zv wjL#Z ej#eb  ciZU `j Z#`i KvR Dc`vcb Ki#e Gici wkyK Gme A½i hZ tbqvi weliq wkyv_x#`i Rvb#eb Ges wbgq#Z hZ w#Z ej#eb </li> <li>mste`x A½i h#Z m#PZb Kivi weliq wky#Ki mnvqZv w#q wkyv_xiv f#gKwfbq K#i t`Lv#e	tkwYi Kv#Ri w#`kK e`envi K#i gj`vqb Ki#eb </li> <li><b>Aa`vqi tkwY AfxYv mRbkxj ck cxwZ#Z AbwôZ n#e

მზგ Aa`vq : c`v`\_i `ekó` Ges ewn`K cfve (10 wciqW)

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv
exE`q</b></p> <p>1. c`v`_i wfb `ekó`i eYbv KiZ cvi`e 2. wfb `ekó`i Dci wf`E K`i c`v`_i tkY`eb`vm KiZ cvi`e </p> <p>3. Zvc I w`r c`iewnZv e`vL`v KiZ cvi`e	c`v`_i tkY`eb`vm - NbZ - KwVb`</li> <li>bgbxqZv</li> <li>Zvc c`iewnZv - w`r c`iewnZv - Zvc I w`r c`iewnZv - avZ I AavZi Zvc I w`r c`iewnZv - Kw - ievi - Zvgv - A`vj`g`bqvg	- wk`v_x`i `jxq KvRi c`qvRbxq DcKiY mieivn Ki`eb, KvR msMvZ Ki`eb, `jxq KvR ch`eyY Ki`eb Ges wk`v_x`i Dc`vcbv Dci w`dWe`vK w``eb </li> <li>c`v`_i mwb`ó`e`kó`mgn Av`jvPbv Ki`eb, Zv`i tkY`eb`vm Ki`eb Ges c`iPZ bZb D`vniY w``eb - wk`v_x c`E KwMR, tciYj, ivei, t`jvrv, Kcvi, A`vj`g`bqvg, g`vM`b`mqvg, `vi ewn`K `ekó` `jxqfv`e tbvU Ki`e, tkY`eb`vm Ki`e Ges tkY`Z Dc`vcb Ki`e - Zvc I w`r c`iewnZv wbY`qi Rb` c`qvRbxq DcKiY wk`v_x`i mieivni e`v Ki`eb </li> <li>G w`l`q wk`v_x`i `jMZ KvR msMvZ Ki`eb, wk`v_x`i KvR ch`eyY Ki`eb Ges wk`v_x`i Dc`vcbv Ici w`dWe`vK w``eb </li> <li>Zvc I w`r c`iewnZv m`ú`K wk`v_x`i AskMnY`f`E`K Av`jvPbv gva`tg G w`l`q wk`v_x`i aviYv `úó Ki`eb </li> <li>wk`v_x`i ewoi KvR tkY`Z Dc`vc`bi e`v Ki`eb Ges w`dWe`vK w``eb - wk`v_x c`E c`v`_i [Kw,ivei,Zvgv, A`vj`g`bqvg] g`a` w``q Zvc c`iewnZ nq w`Kbv Zv wbY`qi Rb` cix`vi Av`qvRb Ki`e  Gi g`a` tKvbU Zvc c`iewnx Ges tKvbU bq Zv KviYmn wbYq Ki`e Ges tkY`Z Dc`vcb Ki`e - evj I e`vUwii mrvv`h` c`E [Kw, ivei,Zvgv I A`vj`g`bqvg] c`v`_i w`r c`iewnZv wbYq Ki`e Ges tKvbU avZ I AavZ KviYmn w`P`Y`Z Ki`e Ges tkY`Z Dc`vcb Ki`e </li> <li>ôZ`g Kxfv`e avZ Ges AavZi Kj`vYKi w`K w`e`Pbvq G`i KvhKifv`e e`envi Ki`e, G, t`jvi msi`y`Y hZk`j n`e I Ab``i m`PZb Ki`e t`m w`l`q GKU ewoi KvR wk`v_xiv m`ú`b Ki`e Ges tkY`Z Dc`vcb Ki`e	- tkYi KvR I e`enviK KvRi wb`kK e`envi K`i gj`vqb Ki`eb - ewoi KvRi wb`kK e`envi K`i gj`vqb Ki`eb

wkLbdj	welqe	wkLb tkLv`bv wbt`kbv	gj`vqb wbt`kbv
4. Mjbv¼ I ùUbv¼ e`vL`v KiþZ cviþe 5. kxZjxKiY e`vL`v KiþZ cviþe 6. AvNvþZ avZ Ges AavZi cwieZb e`vL`v KiþZ cviþe 7. cixÿþYi mvnvþh` avZ I AavZi Zvc I we`r ciwvZv wbyq KiþZ cviþe gþbv`cwr</b></p> <p>8. cixÿþYi mvnvþh` c`v`i Mjbv¼ Ges ùUbv¼ wbyq KiþZ cviþe 9. _vgv Nio, _vþgwUvi mwbcYfvþe e`envi KiþZ cviþe </p> <p><b>AvþeMxq</b></p> <p>10. avZ Ges AavZi Kj`vYKi w`K Dcjvã Kiþe Ges Gþ`i e`envi I msiÿþY hZkj nþe </p> <p>11. cixÿY Kvþug PjvKvþj chvß wbiwcËvgjK e`e`v MnþY Dþ`vMx nþe Ges Abþ`i mþPZb Kiþe	• ùUbv¼ Ges Mjbv¼ • c`v`i Mjbv¼ I ùUbvK wbyq - o cwb - o tgvq - o kxZjxKiY • AvNvþZ avZ I AavZi cwieZb - o Avqib - o Kcvi - o mvjdvi - o Kveb	• Mjbv¼ Ges ùUbv¼ welþq wkÿv_xiv AvfÁZv Dc`vcb Kiþe </li> <li>• MjbvK I ùUbvK welþq wkÿv_xþ`i aviYv úó Kiþeb Ges cixÿvi mvnvþh` Kxfvþe Zv wbyq KiþZ nq Zv eYbv Kiþeb </li> <li>• cixÿvi mvnvþh` Mjbv¼ Ges ùUbv¼ wbyþqi cþqvRbxq DcKiY wkÿv_xþ`i mieivn Kiþeb </li> <li>• wkÿv_xþ`i djvdþji Dci wdvewK w`þeb </li> <li>• cixÿvi mvnvþh` c`Ë [tgvq I cwb] Mjbv¼ Ges ùUbv¼ `jxqfvþe wbyq Kiþe • mgq Ges Zvcgv`v chþeÿY Kiþe Ges Zv tbvU LvZvq wjwceþ Kiþe Ges mgq I Zvcgv`vi wfbZvi e`vL`v tkvYþZ Dc`vcb Kiþe </li> <li>• kxZjxKiY welþq wkÿv_xþ`i aviYv úó Kiþeb Ges D`vniY w`þeb • tkb Ges KLb e`vVÊv nþZ _vþK KvYmn e`vL`v Kiþeb </li> <li>• e`enviK Rþþb kxZjxKiþYi Ae`vb e`vL`v Kiþeb </li> <li>• AvNvþZ tkb avZ I AavZi cwieZb NþU wkÿK e`vL`v Kiþeb Ges c`kb Kiþeb • AvNvþZ avZ I AavZi cwieZb wkÿv_x c`kb Kiþe </li> <li>• wkÿv_xþ`i Dc`vcbvi Dci wdvewK w`þeb • cixÿv iþi cþe wkÿv_xiv thb cYwbiwcËvgjK e`e`v MnY Kþi Zv wvðZ Kiþeb • Ôcixÿv Kvþug PjvKvþj Kxj/c wbiwcËvgjK e`e`v MnY Kiv cþqvRb Ges G welþq Abþ`i Kxfvþe mþPZb Kiþeð tm welþq GKwU ewoi KvR wkÿv_xiv mþub Kiþe Ges tkvYþZ Zv Dc`vcb Kiþe	• e`enviK KvþRi wbt`kK e`envi Kþi gj`vqb Kiþeb • ewoi KvþRi wbt`kK e`envi Kþi gj`vqb Kiþeb </li> <li>• <b>Aa`vqi tkvY Afxÿv mRbkj ck cþvZþZ AbvðZ nþe

Αόγ Αα'vq : wgy (10 wciqW)

wkLbdj	welqe	wkLb tkLv#bv wb'`kbv	gj`vqb wb'`kbv
ewxexq 1. wgy Ges `eYi maúK e'vL'v KiZ cviZe </p> <p>2. wefb cKvi `eYi g'a' cv_K' KiZ cviZe 3. cwb Ges KvVb c`v_ w`tg wefb cKvi `eY c`Z KiZ cviZe 4. `eY Zvcgv'vi cfve e'vL'v KiZ cviZe </p> <p>5. meRxb `veK wntmte cwb e'envi c`kb KiZ cviZe </p> <p>6. mgmE Ges AmgmE wgy c`Z Ges Dcv'vbmgn c_K KiZ cviZe 7. `eY, KjtgW Ges mvm'cbk#bi g'a' cv_K' KiZ cviZe	- wgy Ges `eY</li> <li>wefb cKvi `eY <p>Rjxq `eY</b></p> <ul style="list-style-type: none"> <li>o cvZjv</li> <li>o Nb</li> <li>o maú³</li> <li>o Amaú³</li> </ul> <ul style="list-style-type: none"> <li>wefb cKvi `eY ^Zwi cwb Ges KvVb c`v' i [jeY, wPib, ZtZ, AvUv, ewj, gwU] wgtY</li> </ul> <ul style="list-style-type: none"> <li>`eY Zv'ci cfve - meRxb `veK Ges Gi e'envi</li> <li>mg`Z Ges Amg`Z wgy c`Z Ges c_KKiY - jeYv<sup>3</sup> cwb, mlg - ùUK Ges we'x cwb - Zij-Zij `eY</li> <li>Zij-M'vm `eY	- ÓKxfv#e `eY Ges wgy wfb D`vniY w`tg wkYv_x' i aviYv 'úó KiZeb </li> <li>wgy I `eY ^Zwi DcKiY mieivn KiZeb, c'qvRbxq wb'`kbv w`teb, wefb cKvi `eY Ges wgy ^Zwi i kvhug chteYy KiZeb, c'qvRt#b mnthwMZv KiZeb Ges wkYv_x' i KvRi Dci wWe'vK w`teb - wefb cKvi `eY maúK wkYv_xiv `jxq KvRi gva'tg Zv' i AvfÁZv wjwceX KiZeb Ges tkYtZ Dc`vcb KiZeb </li> <li>v'vweK Zvcgv'vq cwb Ges wefb KvVb c`v' i (jeY, wPib, ZtZ, AvUv, ewj, gwU BZ'w`) c_K c_K wgy/`eY ^Zwi KiZeb, wgtYi ^ewkó' t#vU LvZvq wjwceX KiZeb Ges tkYtZ Dc`vcb KiZeb </li> <li>c`E c`v_ w`tg maú<sup>3</sup> `eY Ges Amaú³ `eY ^Zwi KiZeb, `eYi ^ewkó' t#vU LvZvq wjwceX KiZeb Ges tkYtZ Dc`vcb KiZeb - c`ZKZ `eY Zvc c'qvM KiZ wK cieZb nq Zv LvZvq wjwceX KiZeb Ges tkYtZ Dc`vcb KiZeb </li> <li>`eY Zv'ci cfve D`vniYmn e'vL'v KiZeb </li> <li>meRxb `veK i A_ e'vL'v KiZeb wkYv_x GKU cixY'Yi mvmth' cwb meRxb `veK wntmte cwb ag c`kb KiZeb - cwi`veb I ew'x'feb cwKqv Kxfv#e Acwi@vi jeY t`K cwi@vi jeYtK c_K Kiv hvq cwKqU e'vL'v KiZeb wkYv_x cw'qv AbmiY Kti Acwi@vi jeY t`K cwi@vi jeYtK c_K KiZeb </li> <li>cwi`veb Ges cvZb c'wZ e'envi Kti jeYv<sup>3</sup> cwb ntZ mlg ùUK Ges we'x c`Z c`kb KiZeb - tkYtZ wkYv_x w`úwiU Ges cwb wgtKZ Kti Zij-Zij `eY ^Zwi KiZeb wkYv_x GKU g` cvb'q' tevZj Lj'eb  GuU nte Zij-M'vm `eY wkYK Av'jvPbv Kti wkYv_xi aviYv mmsnZ KiZeb	- tkYi KvRi wb'`KK e'envi Kti gj`vqb KiZeb - e'enviK KvRi wb'`KK e'envi Kti gj`vqb KiZeb

Aóg Aa'vq : wgy

(10 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb tkLv#bv wb'kbv	gj'vqb wb'kbv
8. ^`b»`b Rxe#b `eY, Kj#qW Ges mvm#cbk#bi figKv e'vL'v Ki#Z cvi#e </p> <p><b>cixyv</b></p> <p>9. jeYv<sup>3</sup> cwlb n#Z je#Yi mlg ùUUK Ges we'x cwlb c'Z Ki#Z cvi#e </p> <p><b>gbv#cikR</b></p> <p>10. cixyY Kv#Ri hšcwZ Ges DcKiY mVVKfv#e e'envi Ki#Z cvi#e </p> <p><b>Av#eMxq</b></p> <p>11. Avgv#`i Rxe#b `eY I mvm#cbk#bi Ae`vb Gicwk#qU Ki#e	- mvm#cbkb Ges Kj#qW ^`b»`b Rxe#b `eY, Kj#qW Ges mvm#cbm#bi figKv	- wkyv_x P#Ki ,#ov cwlb#Z wgykZ Ki#e `a, d#ji tR#j Ges we'fb Jla c`kb K#i G#`i c_K c_K `eikó" `jMZfv#i wj#ce#x Ki#e </li> <li>wkyK wkyv_xi Dc'vcbv Dci Av#jvPbv Ki#eb </li> <li>wkyv_x ewo#Z e'eüZ `e'w'`i g#a" `eY, Kj#qW Ges mvm#cbk#bi ZwjKv ^Z#i Ki#e Ges KvY e'vL'v Ki#e - ÔAvgv#`i Rxe#b `eY I mvm#cbk#bi Ae`vbÔ wel#q GKU ewoi KvR m#úv Ki#eb	- ewoi Kv#Ri wb'`kK e'envi K#i gj'vqb Ki#eb Aa'v#qi tkY Afxyv mRbkj ck c#Z#Z AbiôZ n#e

beg Aa`vq : Av#jvi NUbv (10 «cwiqW)

«kLbdj	«elqe	«kLb tklv#bv «b#`kbv	gj`vqb «b#`kbv
«xeE`xq</b></p> <p>1. Av#jvi mÂvjb e`vL`v Ki#Z cvi#e </p> <p>2. e` `«ó#MvPi nIqvI KvIY e`vL`v Ki#Z cvi#e </p> <p>3. Av#jvi cıZdj b I tkvIY e`vL`v Ki#Z cvi#e </p> <p>4. gmY I AgmY Z#j Av#jvi cıZdj b e`vL`v Ki#Z cvi#e </p> <p>5. `c#Y cıZıe« mıóı KvIY e`vL`v Ki#Z cvi#e 6. Avg#`i Pvic#ki msNıvZ «eıfb NUbvq Av#jvi cıZdj#bi e`vL`v Ki#Z cvi#e	• Av#jv Kxfv#e P#j? • Avgiv Kxfv#e t`«L?</li> <li>• Av#jvi cıZdj b I tkvIY</li> <li>• gmY I AgmY Z#j Av#jvi cıZdj b</li> <li>• `c#Y mó cıZıe« • Pvic#ki «eıfb Av#jvKxq NUbv (4«U Rbıcq NUbv)	• Av#jv Kxfv#e P#j ckıU K#i Av#jvi mÂvjb m«ú#K «kÿv_x#`i ce AıfÁZv hvPvB Ki#Z cv#ib  AZtci «kÿv_x#`i DÊi tR#b Av#jvi mÂvjb m«ú#K e`vL`v «`#Z cv#ib </li> <li>• iv#Zi tejv Avavi N#i Avgiv tKvb «KQ t`L#Z cvB bv tKb? teBb ÷ıgs Gi gva#g «kÿv_x#`i KvQ t`#K G ckıUi DÊi tR#b «bb AZtci Av#jvi cıZdj b I tkvIY «elqıU e`vL`v Ki#b • GKıU gmY Z#j Av#jvi cıZdj#bi «PÎ I GKıU AgmY Z#j Av#jvi cıZdj#bi «PÎ t`«L#q `BıU «P#Îi cv_K` ej#Z ejb  AZtci G ai#bi cv_#K`i KvIY Dc`vcb Ki#Z ejb </li> <li>• GKıU `«Q Kv#Pi mıg#b GKRb «kÿv_x#K Ges GKıU Avqbi mıg#b GKRb «kÿv_x#K `vov#Z ejb  tKvbıU#Z Zv#`i t`Lv hv#Q Ges tKvbıU#Z t`Lv hv#Q bv Zv ej#Z ejb Ges Gi KvIY e`vL`v Ki#Z ejb e`vL`vi tÿ#Î «kÿv_x#`i mnıqZv Ki#b </li> <li>• «kÿv_x Avgv#`i Pvic#ki msNıvZ cıZdj bRıbZ Av#jvKxq NUbv `jxqfv#e e`vL`v mn c`kb Ki#e	• tkıYi Kv#Ri «b#`kK e`envi K#i gj`vqb Ki#eb </li> <li>• <b>Aa`v#qi tkıY Afıÿv mRbıj ck c«ıZ#Z AbıôZ n#e

`kg Aa"vq : G‡mv M‖Z‡K Rvw b

(12 wciqW)

wLbdj	welqe	$\text{wLb tkLv\#bv wbt`kbv}$	gj`vqb wbt`kbv
eweExq			
1. $\overline{\text{w}}\text{Z} \mid \text{M}\text{iZi} \text{ c}_{\text{v}}\text{K}'' \text{ Ki}\ddot{\text{z}}$ cvi\te 2. mKj M i Z t h A v t c w y K Z v e v L v Ki\ddot{z} cvi\te 3. wefb cKv i i M i Zi ^e w kó'' eYb v Ki\ddot{z} cvi\te	• $\overline{\text{w}}\text{Z}, \text{M}\text{iZ} \text{ Ges } \text{cm}\frac{1}{2}$ KvWv\gv • MiZ - o mij - o eμ - o NYb - o chveË	• <math>\overline{\text{w}}\text{Z} \text{ Ges } \text{M}\text{iZ} \text{ m}\acute{\text{o}}\ddot{\text{t}}\text{K} \text{ aviy/ AwfÁZv D`vniYmn LvZvq wJL\#e Ges }</math>                 Dc<del>v</del>cb Ki\te </li> <li>• mnR D`vniY Ges wPtîi mrvn\#h'' cm$\frac{1}{2}$ KvWv\gvi (Frame of reference) aviYv l c\qvRbxqZv evLv Ki\teb • cm$\frac{1}{2}$ KvWv\gvi wfĚ\Z <math>\overline{\text{w}}\text{Z} \text{ Ges } \text{M}\text{iZ} \text{ m}\acute{\text{o}}\ddot{\text{t}}\text{K} \text{ wk}\llbracket \text{v}_x\text{t`i AwfÁZvi Ici}</math>                 wdWe<del>v</del>K w`teb • Pricv\k msMwVZ <math>\overline{\text{w}}\text{Z} \text{ Ges } \text{M}\text{iZ} \text{ m}\acute{\text{o}}\ddot{\text{t}}\text{K} \text{ wk}\ddot{\text{y}}_{\text{v}_x\text{t`i h}}^3, \text{tjvi h}_{\text{v}_\text{Zv}} \text{ wbi\cy}</math>                 Ki\teb Ges wKQ D`vniY (thgb:- Nro Ges Nroi KvUv, ti j\#÷kb Ges Pjgvb tUb, Pjgvb tUb Ges mx\U emv hvÎx BZ`w`) w`tq wk<del>y</del>v_xt`i aviYv\K úó Ki\eb • ôwwZ Ges MiZ Kxfv\te G\K Ab'' n\Z Avjv`vô wel\q wk<del>y</del>v_xt`i `jMZ                 KvR msMwVZ Ki\eb Ges wk<del>y</del>v_xt`i Dcvcbvi Ici wdWevK w`teb </li> <li>• Pricv\k msNwVZ NUbv n\Z <math>\overline{\text{w}}\text{Z} \text{ Ges } \text{M}\text{iZi} \text{ D`vniY w`teb Ges h}^3 \text{ mnKv\#i}</math>                 tklY\Z Dc<del>v</del>cb Ki\eb  </li> <li>• ôw<del>w</del>Z Ges M<del>i</del>Z Kxfv\te G\K A\#b'' n\Z Avjv`vô wel\q GKwU tkwYi KvR `jMZ fvt\te m\ub Ki\te Ges tkwY\Z Dc<del>v</del>cb Ki\te </li>   <li>• wefb cKvi M<del>i</del>Z Ges M<del>i</del>Zi tiLwPÎ m\ut\K wk<del>y</del>v_xt`i AwfÁZvi Ici Av\jjPbv Ki\teb • ôwefb cKvi MiZi (mij, eμ, NYb, chveË MiZ) tiLwPÎ A½b Ges G\`i ^ekó'' e<del>v</del>L<del>v</del>\"vô</b> wel\q wk<del>y</del>v_xt`i ewoi KvR tkwY\Z Dcvc\#bi D\`VM                 wb\teb Ges c\qvRbxq wdWe<del>v</del>K w`teb	• tkwYi Kv\#Ri wb\`kk                 e`envi K\i gj`vqb                 Ki\eb </li>   <li>• ewoi Kv\#Ri wb\`kk e`envi K\i gj`vqb Ki\eb

- AbmÜvbg j K
Kv†Ri ‖b†`kK
e'enwi K‡i
KvR‖U gj¨vqb
Ki‡eb|

kg Aa'vq : G#mv M#Z#K Rwb

(12 wciqW)

Pjgub-3

wkLbdj	welqe	wkLb tkLv#bv wb#`kbv	gj`vqb wb#`kbv
7. A#Z#i³ M#Z Kxfv#e Rxe#bi Rb` S#K e#q Av#b Zv e`vL`v Ki#Z cvi#e </p> <p>8. #gYKvjxb w#bvcE#v e`e`v e`vL`v Ki#Z cvi#e </p> <p><b>g#b#c#kR</b></p> <p>9. `#Z c#igv#c ÷c lqvP (v#gv N#o) m#bcYfv#e e`envi Ki#Z cvi#e </p> <p><b>Av#eM#q</b></p> <p>10. #gYKvj#j m#VK w#bvcE#vgjK e`e`v Mn#Y w#b#R m#P#o n#e Ges Ab#`i#K m#PZb Ki#Z cvi#e	- M#Z Ges w#bvcE#v S#K #gYKvjxb w#bvcE#v	- e`envi#K Rxe#b M#Zi m#eav, #jv m#u#K wkyv_x#`i gZvg#Zi lci w#dWe`vK w`#eb - Ohvbev#bi A#Z#i³ M#Z wK Avgv#`i Rb` S#KcY#? wel#qi lci wkyv_x#`i `jMZfv#e tk#Yi KvR c#iPvjbv Ki#eb Ges w#dWe`vK w`#eb - OhgYKvjxb tkb w#bvcE#vgjK e`e`v MnY Kiv c#qvRb Ges Kxfv#e Zv w#b#Z Kiv hvq# D`vniYmn e`vL`v Ki#eb  G#y#i GKRb m#PZb bvM#iK wnt#e c#ievi l mgv#R wkyv_x#`i `wqZ l KZe` m#u#K wb#`kbv w`#eb	tk#Yi Kv#Ri w#b#`kK e`envi K#i gj`vqb Ki#eb </li> <li>Aa`v#qi tk#Y Af#y#v mRbk#j ck c#Z#Z Ab#oZ n#e

GKv`k Aa`vq : ej Ges mij hš (11 wciqW)

wLbdj	welqe	wLb tKLv`bv wb`kbv	gj`vqb wb`kbv
ewEExq ej e`vL`v KiZ cvi`te </li> <li>e`i Dci wfb cKvi etji cfve wEkiY KiZ cvi`te	ej Ges etji wfb i/c (av`v, Uvbv, Uvb, NIY)</li> <li>e`i lci etji wqv	- wk`v_x`i K teA tU`b ev tV`j emZ ejteb Ges GB Uvbv ev tVjv th ej Zv wk`K ejteb  wk`v_x`i Pvicv`ki NUBvej t`K etji D`vniY w`Z ejteb  wk`K Av`jvPbvq dWe`vK w`teb Ges ej m`u`K Zv`i aviYv m`u`o Ki`eb  (Force is a measurable quantity which is either a push or a pull)</li> <li>tVjv ev av`v (Push), Uvbv (Pull), Uvb (Tension), NIY (Friction) m`u`K wk`v_x`i AfAZv Pvicv`ki NUBv t`K D`vniYmn eYbv KiZ ejteb Ges tevW G`b etji wfb i`ci t`i etji wqv (effect) wP AsKb KiZ ejteb wk`v_x`i Av`jvPbv n`Z wk`K etji wqv wfb i/c RxbNwb`o D`vniYi wP AsKb K`i mVKfvte D`vcb Ki`eb Ges wk`v_x`i aviYv m`u`o Ki`eb </li> </ul> <p><b>wk`K Qe G`K wb`Pi welq,tjv wk`v_x`i AskMn`Yi gva`g Av`jvPbv Ki`eb </p> - gB te`q N`i i P`j ev M`Q DVvi mgq gBwU tmvRvfvte bv tnjv`bvfte ivL`j Dc`i DVv mnR n`e? - iv`v Xvj bv n`q Lvov n`j Dc`i DVv mnR n`e Kx?</li> <li>tnjv`bv Zj Kxfvte KvR mnR K`i?</li> <li>PvKv I Ay`E, KicKj, GK PvKv I `B nvZj wek`o tVjvMw (A`ev eo tcv`v`i AvKv G,tjvi wP ) Kv`mg - wk`v_x`jMZfvte wb`Pi KvR,tjv m`u`b Ki`e- - DP tKvb `vb (jA ev`v ÷ gvi) t`K wb`P bvgi mgq gB tnjv`bvfte `vcb Kiv nq tKb ? - tZj f`Z Wg Uv`K DV`bvi mgq tnjv`bv mw`o e`envi Kiv nq tKb? - PoKvq mZv tcv`P`q PvKv GKevi Niv`j Ay`E KZevi Ni`e?	tKvYi KvRi wb`kK e`envi K`i gj`vqb Ki`eb

GKv`k Aa`vq : ej Ges mij hš (11 wciqw)

Pj gvb-2

wkLbdj	welqe	wkLb tkLv#bv wb`kbv	gj`vqb wb`kbv
3. wefb ai#bi mij hšši KvR e`vL`v Ki#Z cvi#e 4. wefb cKvi mij hšši mweav Zjbv Ki#Z cvi#e 5. gvbe#`#ni wefb A#½i mv#_ mij hšši KvRi Zjbv Ki#Z cvi#e </p> <p><b>g#bv#cikR</b></p> <p>6. e`enwiK Rxe#b mij hš e`envi Ki#Z cvi#e </p> <p><b>Av#eMxq</b></p> <p>7. Avgv#`i Rxe#b e#ji cfve Ges mij hšši Ae`vb Gicik#qU Ki#e	• mij hš - o wj fvi - o tnjv#bv Zj - o KwP - o mvowk - o nvZio - o KicKj - o gvbe#`n Ges mij hš	• tkY#Z wkYK KwP, mvowk, nvZio BZ`w` Dc`vcb Ki#eb </li> <li>• e`e D`vniY [KwP w`#q KwMR KvUv, mvowk w`#q tciYj aiv, nvZio w`#q evk ev Kv#V tci#K jvM#bv] Gi mvn#h` KwP, mvowk, nvZioi e`envi t`Lv#eb Ges mn#R KvR ma#b Kivi welqU e`vL`v Ki#eb </li> <li>• e`e D`vniY (wUDe#qj `vc#bi mgq) Gi gva`tg KicK#ji e`envi Ges mn#R KvR ma#b Kivi welqU e`vL`v Ki#eb • gvbe#`#ni A½-cZ`½ Kxfv#e mij hš wnt#e KvR K#i Zv Qie G#K e`vL`v Ki#eb • ej c#qv#Mi tKškj Ges mij hšši mVK e`envi ma#bK wkYv_x#`i m#PZb Kiv#eb Ges Ab#Kl hš e`envi mZK_vK#Z wkYv_x#`i m#PZb Kiv#eb wkYv_xiv tkY#Z I ewo#Z wb#Pi KvR, #jv ma#b Ki#e • KwPi tKvb `v#b KwMR `vcb Ki#j KvUv teik mnR n#e? • mvowk w`#q tKvb e`#K tKv_vq ai#j teik mn#R e`U#K tZjv hv#e?</li> <li>• nvZioi tKv_vq ai#j teik mn#R tci#K jvM#bv hv#e?</li> <li>• GK PvKv I `B nvZj wekó tVjvMwoiU tVjv bv Uv#v mnR? • gvbe#`#ni A½-cZ`½ Kxfv#e mij hš wnt#e KvR K#i? • wefb mij hšši mweav Zjbv wel#q wkYv_xiv GKwU tkYi KvR `jMZfv#e ma#b Ki#e </li> <li>• <b>gvbe#`#ni tKvb A½ tKvb mij hšši KvR K#i Zv wPyZ Ki#e Ges KvR e`vL`v Ki#e wel#q GKwU tkYi KvR wkYv_xiv `jMZfv#e ma#b Ki#e </li> <li>• wkYv_xi e`v#b/ewo#Z th me mij hš e`eÜZ nq Zvi GKwU ZwjKv c`Z Ki#e I G, #jv Kxfv#e Avgv#`i Rxe#b Ae`vb ivL#Q G wel#q GKwU ewoi KvR ma#b Ki#e	• tkYi KvRi wb`kK e`envi K#i gj`vqb Ki#eb </li> <li>• ewoi KvRi wb`kK e`envi K#i gj`vqb Ki#eb • Aa`vqi tkY AfxYv mRbkxj ck c#Z#Z AbiôZ n#e

Øv`k Aa`vq : cll_exi DrciĖ (10 wciqW)

wkLbdj	welqe	wkLb tkLv#bv wb`kbv	gj`vqb wb`kbv
eixexq			
1. cll_exi DrciĖ Nubv eYbv KiþZ cviþe	• cll_exi DrciĖ	• cll_ex Kxfvþe mŏ nj wkŷv_x AfÁZv eYbv Kiþe • cll_exi DrciĖ mŏúK wkŷK Mívkþi I Qwe gva`tg e`vL`v Kiþeb</li> <li>• cll_exi DrciĖ mŏúK wkŷv_x `jMZfvþe tkŷþZ KvR mŏúb Kiþe	• tkŷYi KvþRi wb`kK e`envi Kþi gj`vqb Kiþeb
2. cll_exi MVb e`vL`v KiþZ cviþe	• cll_exi MVb o fZK o Af`šixY	• cll_exi fZK Ges Gi Af`šixY MVþbi weifb`þii Qie Ges gþWþji mŏvŏþh` e`vL`v Kiþeb </li> <li>• tkŷþZ wkŷv_x `jMZfvþe cll_exi Af`šixY MVþbi weifb`þii Qie þcv÷vi þccvi/LvZvq A½b Kiþe	
3. cll_ex, mh Ges Pþ`i cllipq e`vL`v KiþZ cviþe	• cll_ex, mh Ges Pþ`i cllipq	• cll_ex, mh Ges Pþ`i cllipq Ges cll_exi weþkIZ, mþhi , iþZ Ges Pþ` Avþjvi mŏþ mþhi Avþjvi cv_K", Pþ`i `iþZi mŏþ mþhi `iþZi Zjþv Kiþeb	• ewoi KvþRi wb`kK e`envi Kþi gj`vqb Kiþeb
4. figKþŏúi KvY e`vL`v KiþZ cviþe	• figKþŏúi KvY	• cll_ex, mh Ges Pþ`i `eikþŏ`i ZjþvgjK Avþjþbv wkŷv_x ewoi KvR mŏþmþe mŏúb Kiþe </li> <li>• figKþŏú þKgb Kþi nq Zv eYbv Kiþeb Ges figKþŏúi asmvZþK wPÎ c`kb Kiþeb • figKþŏú þZvgvi KiYxq welþq GKU `jMZ KvR tkŷþZ mŏúb nþe	• tkŷYi KvþRi wb`kK e`envi Kþi gj`vqb Kiþeb
AvþeMxq			
5. `jMZ KvþR mZZv, k•Ljv Ges Aþb`i e³e`i ciZ k×v c`kb Kiþe			• Aa`vþqi tkŷY Afxŷv mRbkxj ck c×iZþZ AbŏZ nþe

Î#qv`k Aa"vq : Lv`" I cWó (9 wciqW)

[illegible]

PZ`k Aa`vq : cwiiteþki fvimgv Ges Avgv`i Rxeb (12 wciqW)

wkLbdj	welqe	wkLb tkLvþbv wbt`kbv	gj`vqb wbt`kbv
eixexq 1. cvKwZK cwiiteþk e`vL`v KiþZ cwiiteþ 2. cwiiteþki Dcv`vbmgn e`vL`v KiþZ cwiiteþ   3. cwiiteþki fvimgv` iývq cwiiteþki Dcv`vbmgnþni AvštmaúK e`vL`v KiþZ cwiiteþ   4. cwiiteþki Dcv`vbmgnþni msiýþYi tkškj e`vL`v KiþZ cwiiteþ AvteMxq 5. cwiiteþki fvimgv` iývq cvKwZK cwiiteþki Dcv`vbmgnþni Ae`vb Dcjwä Kiþeþ  6. cwiiteþki Dcv`vbmgn msiýþY mþPZb nþeþ	• cvKwZK cwiiteþk • cwiiteþki Dcv`vb               <ul style="list-style-type: none"> <li>o gwU</li> <li>o cwib</li> <li>o evq</li> <li>o Dm` - o cvYx • cwiiteþki fvimgv`</li> <li>• cwiiteþki fvimgv` iývq Dcv`vb, þjvi AvštmaúK Ges cvi`úwK wbfikxjZv • cwiiteþki Dcv`vbmgnþni msiýþYi tkškj	• cvKwZK cwiiteþk mawþK wkýv_x AwfÁZv eYbv Kiþeþ • ÔcvKwZK cwiiteþki Dcv`vb wPwýZÔ Kiv welþq GKwU tkwYi KwR mawþb Kiþeþ </li> <li>• wkýK ÔcvKwZK cwiiteþki Dcv`vb ev`e D`vniY Ges PvU GþK e`vL`v Kiþebþ • cwiiteþki Dcv`vbmgnþK wbtq cvKwZK cwiiteþki GKwU wPÎ þcv÷vi KwMþR Awþb Kiþeþ </li> <li>• fvimgv` ejþZ Kx eSvq wkýv_x AwfÁZv eYbv Kiþe Ges Gi mvþ_ cwiiteþki fvimgv`i Zjbv Kiþeþ </li> <li>• wkýK cwiiteþki fvimgv` e`vL`v Kiþeb, cwiPZ D`vniY w`þebþ • cwiiteþki Dcv`vb, þjvi gþa` mawþK e`vL`v Kiþebþ wKfvþe gwU, cwib, gwU, evq, Dm` I cvYx cvKwZK cwiiteþki fvimgv` iýv KiþQ Zv e`vL`v Kiþebþ cwiiteþki fvimgv` iývq cwiiteþki Dcv`vbmgnþni Avšt wbfikxjZv e`vL`v Kiþebþ • wkýv_xiv fwgKwfbq Gi mvnþh` cwiiteþki Dcv`vbmgn wKfvþe cwiiteþki fvimgv` iývq Ae`vb ivLþQ c`kb Kiþeþ </li> <li>• cwiiteþki Dcv`vb wKfvþe msiýþY Kiv hvq wkýv_x eYbv Kiþeþ • wkýK cwiiteþki Dcv`vbmgnþni msiýþYi tkškj e`vL`v Kiþebþ </li> <li>• Ôcwiiteþki fvimgv` iývq cvKwZK cwiiteþki Dcv`vbmgnþni Ae`vbÔ welþq GKwU tkwYi KwR `jMZfvþe mawþb Kiþeþ </li> <li>• Ôcwiiteþki Dcv`vbmgn msiýþY wKfvþe wbtR mþPZb_vKþeÔ welþq GKwU ewoi KwR mawþb Kiþeþ	• tkwYi KwþRi wbt`kK e`envi Kþi gj`vqb Kiþebþ </li> <li>• ewoi KwþRi wbt`kK e`envi Kþi gj`vqb Kiþebþ • Aa`vþqi tkwY Afxýv mRbkxj ck cxwZþZ AbwôZ nþeþ

8. $wk_{\dot{v}\mu g} QK$ $m\beta g \dagger k_{wY}$

c_g Aa'vq : wba'kYi Rxe

(9 wciqW)

wKLbdj	welqe	wKLb tkLv'bv wb'`kbv	gj'vqb wb'`kbv
ewxeE'xq 1. AbRx'ei ^e'kó" e'vL'v Ki'Z cvi'te 2. AbRx'ei tkwYieb'vm Ki'Z cvi'te 3. fvBivm, e'vK'Uuiqv I A'wgevi ^e'kó" ebbv Ki'Z cvi'te 4. gvbe't'n ^v'`S'K m'ó'Z fvBivm, e'vK'Uuiqv I G'Uwgevi f'gKv e'vL'v Ki'Z cvi'te </li> <li>5. fvBivm, e'vK'Uuiqv I G'Uwgevi Kv'Y mó gvbe't'n ^v'`S'K ciZ'tiva Ges ciZKvi e'vL'v Ki'Z cvi'te	• AYRx'e • AbRx'ei tkwYieb'vm - o g'tbiv - o t'cwU÷v • fvBivm • e'vK'Uuiqv • A'wgev • ^v'`S'K - o ciZ'tiva - o ciZKvi	• wky'K wky'v_x't`i Kv'Q Rvb'tZ PvB'teb Zviv t'K K'te t'Kvb t'iv'M Av'vŠ n'tq'Qj, wky'v_xiv t'iv'Mi bvg ejvi mv't_ mv't_ bvg, t'jv wky'K tev'W wjL'teb </li> <li>• Gme t'iv'Mi g'ta" AYRx'eR'vZ t'iv'M, t'jvi Av'jv`v Z'w'j Kv tev'W wjL'teb • Gici wky'K AYRx'e I AYRx'ei tkwYieb'vm m'p'U wky'v_x't`i aviYv t't'eb </li> <li>• wky'v_xiv wP'Imn w'efb ai'tbi AYRx'ei b'v'gi GK'U Z'w'j Kv c`Z Ki'te • wky'K ceeZx Kv'tm wky'v_x't`i w'efb `t'j f'vM K'ti fvBivm, e'vK'Uuiqv I A'wgevi wP'Y'Z wP'Î t'cv÷v'ti AsKb K'ti Av'b'tZ wb't`kbv w't'eb</li> <li>• GBme t'cv÷vi Kv'tm c`kb Ki'teb Gi g'ta" n'tZ f'vj wP'Î ev'QvB K'ti wky'v_x't`i fvBivm, e'vK'Uuiqv I A'wgevi ^e'k'ó'i mv't_ c'w'ipq Kiv'teb Ges G Z'b ai'tbi AYRx'ei Av'gj, t'jv LvZ'vq wjL'tZ ej'teb</li> <li>• wky'v_xiv ewo t't'K ^Z'w'j K'ti Av'b fvBivm, e'vK'Uuiqv I G'Uwgev/A'wgevi t'cv÷vi Kv'tm c`kb Ki'te • wky'v_xiv `t'j f'vM n'tq fvBivm, e'vK'Uuiqv I A'wgevi g'ta" Av'gj, t'jv LvZ'vq wjL't Dc'vcb Ki'te</li> <li>• wky't'Ki wb't`kbv Abq'vq wky'v_xiv AYRx'eR'vZ gv'b'li t'iv'M ciZ'tiva I ciZKv'ti i e'e`v D't'jLmn GK'U Z'w'j Kv c`Z Ki'te Ges Gme t'iv'M n'tZ i'Yv cv'lqvi e'v'cv'ti m'p'Zb n'te	• tkwYi Kv'Ri wb't`kK e'envi K'ti A'v'buU gj'vqb Ki'teb </li> <li>• ewoi Kv'Ri wb't`kK e'envi K'ti `jMZ Kv'RiU gj'vqb Ki'teb • Aa'v'tqi tkwY Af'Y'v mRbk'j ck c'x'Z'tZ Ab'ôZ n'te

c_g Aa'vq : wba tkYi Rre

(9 wciqW)

Pj gvb-2

wKLbdj	welqe	wKLb tkLv#bv wb`kbv	gj`vqb wb`kbv
6. ^kev j I QÎv#Ki ^ekó" e"vL"v Ki#Z cvi#e 7. ^kev j I QÎv#Ki DcKwiZv I AcKwiZvi e"vL"v Ki#Z cvi#e 8. Kxfv#e QÎvK msµgY c#Z#iva Kiv hvq Zv e"vL"v Ki#Z cvi#e Av#eMxq 9. fvBivm, e"vK#Uw#iqv I A"vUw#gevi Kv#Y mó gvbe#`tn "v`S#K c#Z#iva Ges c#ZKv#i wb#R m#PZb n#e Ges Ab`#`i m#PZb Ki#Z cvi#e 10. QÎvKR#bZ tivM msµg#Yi wel#q wkýv_xiv wb#R m#PZb n#e I Ab`#`i m#PZb Ki#Z cvi#e	• ^kev j • QÎvK • ^kev j I QÎvK Gi cfve • QÎvK msµgY • c#Z#iva I c#ZKvi	• wkýK ceeZx Kv#m wkýv_x#`i i#K Zv#`i ewoi Avkcvk, m"vZ#m#Z RvqMv, cKi NvU, Rjvq n#Z e"v#Oi QvZv, %kev j msMn K#i Avb#Z ej#eb Z#e e"v#Oi QvZv msM#ni mgh nv#Z Mvfm ev c#j#_b e"vM c#i wb#Z wb#`kbv w`#eb • Gme D#m#`i eY #K, G#`i ^ekó" #K Rvb#Z PvB#eb Gici QÎvK I ^kev j Gi ^ekó" Dc`vcb Ki#eb</li> <li>• wkýv_xiv Gme D#m#`i tKv_vq Rb#q, G#`i g#a" cv_K" #K Zv `#j fvM n#q LvZvq wjL#e • wkýv_xiv `#j fvM n#q ^kev j I QÎv#Ki em`vb, wP#yZ wPÎ I cv_K" wj#L Dc`vcb Ki#e</li> <li>• wký#Ki wb#`kbv Abhvqx Zv#`i ceeZx cv#Vi Av#jv#K ewoi KvR wnmv#e gvbeR#eb ^kev j I QÎv#Ki DcKwiZv I AcKwiZvi Dci GK#U c#Z#e`b ^Zwi K#i Kv#m Dc`vcb Ki#e</li> <li>• wkýK wkýv_x#`i c#Z#e`bi Av#jv#K gvbeR#eb ^kev j I QÎv#Ki , i#Z m#ú#K Av#jvPbv Ki#eb</li> <li>• QÎvKR#bZ Pg#iv#Mi D`vniY w`#q G tivM gv#li i#`tn #Kfv#e msµgZ nq Zv Av#jvPbv Ki#eb Gici Gme tivM c#Z#iva/c#ZKv#i i Rb" Kx e#e`v t#lqv hvq Ges Gme tivM c#Z#iv#a #Kfv#e c#iev#i i m`m#`i m#PZb Kiv hvq Zv `jMZfv#e wj#L Dc`vcb Kivi Rb" wkýv_x#`i wb#`kbv w`#eb • wkýv_xiv QÎvKR#bZ tiv#Mi c#ZKvi I c#Z#iva m#ú#KZ m#PZbZvi aviYv `jMZfv#e LvZvq wj#L Kv#m Dc`vcb Ki#e wkýv_x#`i Dc`vcbvi Av#jv#K wkýK wDWe"vK t`#eb	• tkYi Kv#Ri wb#`kK e"envi K#i A#b#U gj`vqb Ki#eb • ewoi Kv#Ri wb#`kK e"envi K#i `jMZ KvR#U gj`vqb Ki#eb • Aa'vqi tkY Afxýv mRbkj ck c#Z#Z Ab#ôZ n#e

$\mathbb{W}^0 \mathbb{Z}^{\mathbb{X}} \mathbb{q} \mathbb{A} \mathbb{a}^{\mathbb{v}} \mathbb{q} : \mathbb{D} \mathbb{W}^{\mathbb{T}} \mathbb{I} \mathbb{c} \mathbb{v} \mathbb{Y} \mathbb{x} \mathbb{i} \mathbb{t} \mathbb{K} \mathbb{v} \mathbb{l} \mathbb{x} \mathbb{q} \mathbb{m} \mathbb{s} \mathbb{M} \mathbb{V} \mathbb{b} \quad (10 \mathbb{w} \mathbb{c} \mathbb{w} \mathbb{i} \mathbb{q} \mathbb{W})$

«Klbdj	«elqe	«Klb t«Lvbv «b`kbv	gj`vqb «b`kbv
«xeE«q			
1. D«™` Ges cvY« tKv«li «P«ýZ «PÎ A½b KižZ cvi«e	• D«™` tKv«li MVb I ^«kó`	• «kÿv_xt`i ck K«i tKvI m«ú«KZ ceÁvb hvPvB Kižeb	• t«Yi Kv«Ri «b`kK e`envi K«i A½b«U gj`vqb Kižeb
2. cvY« Ges D«™` tKv«li Zjbv KižZ cvi«e	• cvY« tKv«li MVb I ^«kó`	• «kÿv_xiv ewoi KvR «ntm«e GK«U D«™` I GK«U cvY« tKv«li «P«ýZ «PÎ A½b K«i «kÿK«K t`Lv«e	• t«Yi Kv«Ri «b`kK e`envi K«i `jMZ KvR«U gj`vqb Kižeb
3. tKv«li «efb A½vbi MVb I KvR e`vL`v KižZ cvi«e	• tKvI xq A½vb o tKvI cvPx i o «bD«Kqm o tKvI Mn`i o cW ÷ W o gvB`UvK«Úqv	• «kÿv_xiv tcv÷v«i Q«Ki m«v«h` D«™` I cvY«i cv_K` c`kb Kiže	• ewoi Kv«Ri «b`kK e`envi K«i `jMZ KvR«U gj`vqb Kižeb
4. «efb cKvi «Um`i KvR e`vL`v KižZ cvi«e	• «Um`	• «kÿv_xt`i `tj f«M K«i tKvI xq A½vb ,tjvi «PÎ AvK«Z ejžeb	
5. D«™` I cvY« «Um`i cv_K` KižZ cvi«e	• D«™` «Um`i ^«kó` I KvR o f«RK «Um` o `vqx «Um`	• Gici «kÿK Gme A½vbi MVb I KvR e`vL`v Kižeb	
	• cvY« «Um`i ^«kó` I KvR o AveiY« o thvRK o t«k o `vq	• «kÿ«Ki m«vqZv «bq «kÿv_xiv mij AY«ýY hš` tcqvR cvZvi Z«Ki tKvI ch«ýY Kiže	
		• ck K«i tKvI xq A½vb m«tÚ «kÿv_xt`i ceÁvb hvPvB Kižeb	
		• «kÿv_xt`i `tj f«M K«i tKvI xq A½vb ,tjvi «PÎ AvK«Z ejžeb	
		• Gici «kÿK Gme A½vbi MVb I KvR e`vL`v Kižeb	
		• «kÿ«Ki «b`k Abhv« «kÿv_xiv «efb aižbi tKvI xq A½vbi «P«ýZ «PÎ A½b K«i c`kb Kiže	
		• e`vK«U«iqv ev A`«gevi gZ GK«KvI« R««e me KvR th tKv«IB m«N«UZ nq GiKg D`vniY «`tq eÚtKvI« R««e hveZxq KvR «Kfv«e m«ú« nq «kÿv_xt`i Kv«Q RvbžZ PvBžeb  «kÿv_xt`i D«i cvIqvi ci R««e Kv«Ri/kg «efvRb m«tÚ aviY« «`tq «Um` «K e`vL`v Kižeb	
		• «PÎ G«K D«™` «Um`i cavb cKvižf` AvžjvPbv Kižeb	
		• i³, t«k, `vq «K KvR K«i «kÿv_xt`i Kv«Q RvbžZ PvBžeb «kÿv_xt`i D«i t«tj G,`j tKvb aižbi «Um` Øviv M«VZ Zv e`vL`v Kižeb	
		• «kÿv_xiv e`vK«U«iqv ev A`«gevi tKv«I «K «K KvR nq Zvi GK«U Z«jKv žZvi Kiže	
			• Aa`v«qi t«Y Af«ýv mRb«j ck c«iZž Ab«žZ nže

(12 wci qW)

RvZxg 11kÿv µg 2012

PZ_ Aa'vq : kmb (10 wciqW)

wkLbdj	welqe	wkLb tkLv#bv wbt`kbv	gj`vqb wbt`kbv
eixEixq 1. Rxtei kw³ Drcv`b ciμqv e'vL'v KiZ cvite 2. cevn wPîi mrvv#h' cvYxi kmbZšši cavb Askmg#ni KvR eYbv KiZ cvite 3. kmbZšši tiv#Mi KviY I tiv#Mi jÿY eYbv KiZ cvite 4. kmbZšši tiv#Mi ciZšiva I ciZKvi i tKškj e'vL'v KiZ cvite 5. mv#jvK ms#kiY Ges kmb ciμqv Zjbv KiZ cvite g#bv#cikR 6. cvYxi kmbZšši cavb Askmg#ni wPî A#b KiZ cvite	• kmb • DTM` I cvYx t`#n kmb ciμqv • cvYxi kmbZšši cavb Ask • Kv#μgi cevn wPî • kmbZšši tiv#Mi KviY, tiv#Mi jÿY, ciZšiva I ciZKvi • kmb I mv#jvKms#kiY	• wkÿv_xt`i ck Kti Rvb#Z PvB#eb Avgiv Aw`#Rb tkB MnY Kwi Ges KvR Kivi Rb' kw³ tkv_v n#Z cvB wkÿv_xt`i DËšii ciitc#ÿ#Z Aw`#Rb Mn#Yi KviY I kw³ Drcv`#bi ciμqvU ms#ÿBfv#e Av#jvPbv Ki#eb Ges wkÿv_xt`i `jxqfv#e eB c#o Av#jvPbv Kivi Rb' 10 wgrbU w#aviY Kti w`#eb • wkÿv_xiv `jxqfv#e km#bi AskMnYKvix Dcv`vbmgn#ni bvg Ges km#bi d#j Drcb Dcv`vbmgn LvZvq wjL#e </li> <li>• ciZwU `j n#Z GKRb Kti wkÿv_x Dcv`v#bi bvgmgn tev#W wjL#e Ges g<sup>3</sup> Av#jvPbv tk#l wkÿK w#dWe`vK t`#eb </li> <li>• wkÿv_xt`i Kv#Q Avgiv kvm ck#m tkB MnY I Z`vM Kwi Zv Rvb#Z PvB#eb Ges kv#m wK MnY Kwi Avi ck#m wK Z`vM Kwi ZvI Rvb#Z PvB#eb wkÿv_xt`i DËi cvlqvi ci cvYxi kmb KvR m#t#U Av#jvPbv Ki#eb </li> <li>• PvU gvb#li kmbZšši wPî t`#L wkÿv_xt`i wPî AvK#Z wbt`k t`#eb Ges kmbZšši w#fb As#ki KvR e'vL'v Ki#eb </li> <li>• wkÿv_xiv PvU t`#L gvb#li kmbZšši wPî A#b Ki#e Ges kvm-ck#m tkvb M`vm MnY I tkvb M`vm Z`vM Kiv nq Zv LvZvq wjL#e </li> <li>• wkÿK `nb m#ú#K aviYv c`vb Kti wkÿv_xt`i kmb I `n#bi Zjbv KiZ ej#eb </li> <li>• ceeZx cv#Vi Av#jvK `jMZfv#e mv#jvKms#kiY Ges km#bi g#a` Zjbv Ki#e </li> </ul> <p><b>nv#Z Kj#g KvR : kmb ciμqv Kveb wB A`vBW Drcv`b</b></p> <ul style="list-style-type: none"> <li>• GKwU ck` gLiqjv Kv#Pi tev#Zj GKwU tZjv#cvKv wbtq Gi XvKbv fvj fv#e AvU#K w`#e </li> <li>• NËv `B ci Kv#Pi tev#Zj i XvKbv L#j mveav#b GKwU Rjš tgvgewZ Kv#Pi tev#Zj c#ek Kiv#e • NUBwU ch#eÿY Ki#e Ges djvdj e'vL'v Ki#e • wkÿK w#dWe`vK w#n#m#e cixÿwUi c#qvRbxq e'vL'v Ki#eb	• tkwiYi Kv#Ri wbt`kK e'envi Kti e'enviK KvR I A#bU gj`vqb Ki#eb • tkwiYi Kv#Ri wbt`kK e'envi Kti `jMZ KvRwU gj`vqb Ki#eb </li> <li>• ewoi Kv#Ri wbt`kK e'envi Kti `jMZ KvRwU gj`vqb Ki#eb • Aa`v#qi tkwY Afxÿv mRbkj ck c#Z#Z AbiôZ n#e

cÂg Aa`vq : cwiK ZŠ Ges i³ msenb ZŠ

(10 wciqW)

wKLbdj	welqe	wKLb tkLv#bv wb`kbv	gj`vqb wb`kbv
eixeq 1. cevn wPti mwnv#h cwiKZŠi cab As#ki KvR e`vL`v KiZ cvi#e 2. Lv` cwiK GbRvBgi fvgKv e`vL`v KiZ cvi#e </p> <p>3. Lv` cwiK cwiKZŠi KvR e`vL`v KiZ cvi#e 4. cwiKZŠi tivMi KviY I tivMi jY eYbv KiZ cvi#e 5. cwiKZŠi tivMi cZiva I cZKvii tKškj e`vL`v KiZ cvi#e 6. i³ I i³ KviY KviY e`vL`v KiZ cvi#e	• cevn wPti mwnv#h cwiKZŠi cab As#ki KvR • Lv` cwiK GbRvBgi fvgKv</li> <li>• Lv` cwiK cwiKZŠi KvR • cwiKZŠi m ivLvi Dcvq • cwiKZŠi tivM I mPZbZv	• wkyK wkyv_x#i wRÁmv Ki#eb Avgiv t`ni tKv Ask w`tq Lv` MnY Kai   wkyv_xiv DĒi w`j wkyK GwU tKv ZŠi Ask Zv D#jL Ki#eb Ges t#W Avgv`v Avgv`v f#e wRnev, `vZ, cK`jx, y`v#š Qe wkyv_xiv `#j fM n#q GB Ask, #jvi KvR LvZvq wjL#e tKvY#Z `#ji Dc`vcb I ck DĒi i gva`g g<sup>3</sup> Av#jvPbv t#I wkyK wdvK w`#eb • wkyK cwiKZŠi GKwU cevn wPti A#b K#i Gi Kv#ug e#Stq w`#eb </li> <li>• Lv` cwiK GbRvBgi fvgKv e`vL`v Ki#eb • Lv` cwiK cwiKZŠi KvR e`vL`v Ki#eb </li> <li>• wkyv_xiv cwiK ZŠi tivM wKf#e cZiva Ki#e Ges `v` mPZbZv Mto tZvjvi tY#I Kx e`v tblqv hvq tm ma#K wkyv_x#i wRÁmv Ki#eb Ges Zv`i DĒi i cwiKZŠi wdvKmn ek` f#e Av#jvPbv Ki#eb • wkyv_xiv LvZvq cwiKZŠi wfb tivMi bvg wjL#e `#j w#f<sup>3</sup> n#q wkyv_xi wK KviY tivM, #jv nq Zv LvZvq wj#ce# Ki#e  cZwU `#ji c#y GKRb Dc`vcb Ki#e  A#b`iv Zv t#U LvZvq wjL#e g³ Av#jvPbv t#I wkyK wdvK w`#eb </li> <li>• wKf#e `v` mPZb nIqv hvq Zv wkyv_xiv LvZvq wjL#e I GKRb Dc`vcb Ki#e Gici g³ Av#jvPbv t#I wkyK wdvK w`#eb  KvR wnt#e wkyv_xiv c_K c_K Ask, #jvK GK m#_ K#i cY# GKwU ewoi KvR wnt#e wkyv_xiv wfb cwiKZŠi tivMi bvg I Zv t#K cwiY cIqv Dcvq wj#L Av#e  wkyK Zv tKvY#Z Dc`vcb KiZ ej#eb Dc`vcb t#I wkyv_xiv Ab`i `v` mPZbZv ma#K DrmwNz KiZ D# n#e • wkyv_x#i i³ i is, `v` BZ`w` eYbv KiZ ej#eb • eYbv mI a#i wkyv_x#i K#Q i³ i `ekó` tR#b Zv t#W Dc`vcb Ki#eb	• tKvi KvRi wb`kK e`envi K#i A#bU gj`vqb Ki#eb </li> <li>• tKvi KvRi wb`kK e`envi K#i `jMZ KvRwU gj`vqb Ki#eb </li> <li>• ewoi KvRi wb`kK e`envi K#i `jMZ KvRwU gj`vqb Ki#eb

Pj gvb-2

«kLbd j	«elqe	«kLb t«kLv`bv «b` kbv	gj`vqb «b` kbv
7. i³ msenbZŠ e`vL`v Ki†Z cvi†e 8. ü`«c†Êi K«R e`vL`v Ki†Z cvi†e </p> <p>9. ü`«cÊ†K m` ivLv i Dcvq e`vL`v Ki†Z cvi†e </p> <p><b>g†bv`c«kR 10. c«icvKZ†Ši cavb Aš†ki «PÎ A½b Ki†Z cvi†e Av†eMxq 11. c«icvKZ†Ši †iv†Mi «el†q «b†R m†PZb n†e Ges c«ie†i i mKj†K m†PZb n†Z Dø× Ki†e	• i³ l i³ K«YKv • i³ msenbZŠ : i³ evnx bv jx • ü`«c†Êi K«R ü`«cÊ†K m` ivLv i Dcvq	• «PÎ G†K i³ K«YKv m†Ü aviYv `†eb </li> <li>• «kÿ†Ki «b` kbv Abhvqx «kÿv_xiv `†j f«M n†q i³ l i³ K«YKv m†Ü Av†jvPbv Ki†e Ges i³ l i³ K«YKvi `ewkó` LvZvq wj†L `†ji c†ÿ GKRb Dc`vcb Ki†e  †k«Y†Z D†š³ Av†jvPbv †k†l «kÿK «dWe`vK `†eb </li> <li>• «kÿK «kiv l agbx m†ú†K «kÿv_x†`i n†Zi c†jm Abfe Ki†Z ej†eb Ges †Kb `ú`b n†`Q †mB Av†fÁZv eYbv Ki†Z ej†eb  «kÿK Rvb†Z P†B†eb «kiv l agbx `B«U Avjv`v i³ evnx b«wjKv Zv «Kfv†e eSv hvq  «kÿK cieZ†Z «kiv l agbx m†ú†K «kÿv_x†`i m`úó aviYv `†eb, †Kb agbxi `ú`b nq Zv eiS†q `†eb </li> <li>• «kÿv_xiv «b†R†`i n†Zi bxj is Gi `k`gvb b«wjKv Ges `ú`b AbfeKvix b«wjKvi g†a` Kxfv†e Avjv`v Zv «bYq K†i LvZvq wj†L Dc`vcb Ki†e  Dc`vcbv †k†l «kÿK «dWe`vK `†eb • «kÿK «kÿv_x†`i «RÁvmv Ki†eb †Zigiv hLb «m«o †e†q Dc†i DV ZLb †Zig†`i kix†i i †Kvb A†½i `ú`b †eto hvq †Kb †eto hvq? «kÿK ü`«c†Di K«R e`vL`v Ki†eb </li> <li>• «kÿv_x†`i «kÿK «RÁvmv Ki†eb Z†`i c«i«PZ K†iv ü`†ivM n†q†Q «Kbv ? «kÿv_x DÊi `†j «kÿK «K Kvi†Y ü`†ivM nq Zv «ek` fv†e Av†jvPbv Ki†eb </li> <li>• ÔKxfv†e c«ie†i i m`m†`i ü`hš m` ivLv «el†q m†PZb Ki†eð «el†q GK«U `jxq K«R †k«Y†Z m†úb Ki†e AbmÜvbgjK K«R : • «kÿ†Ki «b` kbv Abhvqx «kÿv_xiv ü`†ivM Avµvš e`³ i «K Kvi†Y D³ †ivM n†q†Q Ges «Kfv†e †m`v` m†PZb n†j ü`†ivM Go†bv hvq Zv ewoi K«R «n†m†e wj†L Av†e †k«Y†Z Dc`vcb †k†l «kÿK «dWe`vK `†eb	• †k«Yi K†Ri «b` kK e`envi K†i A½bU gj`vqb Ki†eb </li> <li>• ewoi K†Ri «b` kK e`envi K†i `jMZ K«R«U gj`vqb Ki†eb </li> <li>• <b>Aa`v†qi †k«Y Afxÿv mRbkxj ck cx«Z†Z Ab«ôZ n†e

Iô Aa`vq : c`v`_i MvB

(12 wciqW)

wKLbdj	welqe	wKLb tkLv`bv wb`kbv	gj`vqb wb`kbv
ewEExq 1. c`v`_i MvB e`vL`v KiZ cvite 2. tgšjK Ges thšMK c`v`_i gta` cv_K` KiZ cvite 3. ý`Zg KYvi gZev`i Zjbv KiZ cvite 4. AY I cigYi gta` cv_K` KiZ cvite 5. cZxK Ges msKZ e`envi Kti wbevPZ tgšjK Ges thšMK c`v`_ cKvk KiZ cvite </p> <p>6. chvq mviYi cv_wgK aviYv eYbv KiZ cvite </p> <p>7. cixYvi mrvq`q` tgšjK c`v`_ nZ thšMK c`v`_ c`Z KiZ cvite	- c`v`_i MvB - tgšjK I thšMK c`v`_i ^ewkó - ý`Zg KYvi gZev` o Gwi`÷vUj o Wëb</li> <li>cigY I cZxK</li> <li>Ab I msKZ [ chvq mviYi 1-10]</li> <li>chvq mviY mšúK cv_wgK aviYv</li> <li>tgšjK c`v`_ nZ thšMK c`v`_ (SO<sub>2</sub>, FeS, MgO) ^Zii mnR cixY	c`v`_i MvB mšúK wky`_x`i aviYv w`teb </li> <li>wky`_x`i Dc`vc`bi Ici wDwe`vK w`teb  cWZ`j`K c`qvRYxq c`v`_ mieivn KiZeb [PK, Kqjv, wPwb, jeY, Zvgv t`jvrv BZ`w`]</li> <li>ý`Zg KYvi wfb gZev` e`vL`v KiZeb  tgšjK Ges thšMK c`v`_i ^ewkó wPwYZKiY wltq wky`_xi djvd`ji Dci wDwe`vK w`teb  wky`_x`jMZfvte ZZ, ewj I t`jvrv i`ov wgyK Kti Dcv`vb, t`jv`K PwKxKiY, cwi`veb Geq ev@úxfetbi mrvq`h` c_K KiZeb </li> <li>`jxq KvR wntmte PK, Kqjv, wPwb, jeY BZ`w` ,ov KiZeb, cwieZb chteYy KiZeb, LvZvq tbvU KiZeb Ges tkiYtZ Dc`vcb KiZeb </li> <li>t`jvrv, Zvgv wK ai`bi KYv w`tq ^Zwi Zv h<sup>3</sup> w`tq LvZvq wjLte </li> <li>Dc`i i Kvhutg e`enZ c`v`_ ,t`jv Avjv`v Kti Gt`i ^ewkó mgn wjLte, tKvbwU tgšjK ev thšMK Zv wPwYZ KiZeb Ges wky`Ki mntwmZvq mrvq`teki gWj PvU ^Zwi KiZeb Ges tkiYtZ Dc`vcb KiZeb </li> <li>ý`Zg KYvi wfb gZev`i mvt`_ wky`_xiv Zv`i djvd`ji wtkiY KiZeb </li> <li>GKwU cwiwPZ tgšjKi tcvUb, Bt`j±b I wbdU`bi msL`v I Ae`vb e`vL`v KiZeb  AY I cigYi aviYv e`vL`v KiZeb  Gt`i`K th cZxKi mrvq`h` cKvk Kiv hvq Zv eYbv KiZeb </li> <li>wky`Ki mrvqZvq tgšjK KYvi cZxK wjLte evqi Dcv`vb Ges chvq mviY nZ wbevPZ tgšji cZxK wjLte </li> <li>ewoi KvR wntmte wKQ wbevPZ cZxKi bvg wjLte  GKwU cwiwPZ tgšjKi tcvUb, Bt`j±b I wbdU`bi msL`v I Ae`vb e`vL`v KiZeb </li> <li>wky`_x tkiYi KvR wntmte `jMZfvte wbevPZ tgšjKi cigYi MvB wPî A%b KiZeb Ges Gt`i PwRi e`vL`v c`vb KiZeb </li> <li>tgšjK t`K thšMK c`v`_ ^Zwi i cYvjx e`vL`v KiZeb Avqib I mvjdvi, g`vM`bmrvq`gi `nb I mvjdvi i`n`bi th thšMK c`v`_ Drcb nq Zv e`vL`v KiZeb wky`_x G, t`jv nZ Kjt`g c`kb KiZeb	tkiYi KvRi wbt`kK e`envi Kti gj`wqb KiZeb </li> <li>tkiYi KvRi wbt`kK e`envi Kti gj`wqb KiZeb

lô Aa`vq : c`v`_i MVb (12 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv
8. thšM n#Z tgš`j i c_KxKiY eYbv Ki#Z cvi#e	thšM t_#K tgš`j c_KxKiY	thšM, #jv#K wKfv#e Zv#`i cigvYi cZxK I msL`v e`envi K#i Zv#`i ms#KZ wjL#Z n#f Zv eYbv Ki#eb `jMZfv#e wkŸv_x wKQ tgš`j Ges thš`Mi cZxK I ms#KZ wjL#e </li> <li>Zvc Ges Zlor we#kl#Yi mrvn#h` wKfv#e thšM t_#K tgš`j#K c_KxKiY Kiv hvq wPîmn e`vL`v Ki#eb	Aa`vqi tkwY AfxŸv mRbkxj ck c#Z#Z AbiôZ n#e

mßg Aa'vq : k³i e'envi (10 wciqW)

wLbdj	welqe	wLb tKLv#bv wb`kbv	gj`vqb wb`kbv
eixeq 1. k³i I KVR e'vL'v KiZ cvi#e 2. k³i wefb i#c e'vL'v KiZ cvi#e 3. k³i i#cviš#ii cvi'úiiK m'úK we#kiY KiZ cvi#e	• k³i I KVR • k³i wefb i#c - o hwiŠK (w'wZI MIZ) - o imvqubK - o Zvc - o Av#jv - o kã - o Zvor - o PaK • k³i wefb i#ci i#cviš#i I e'envi - o gvb#li kvixieExq Kv#m#g k³i i#cviš#i - o tXwK - o t'vjbv - o tgevbJ t'dvb - o m'aviY tKvI - o tRbv#iUi - o gUi	• D`vniY w`#q k³i m'úK wky_v_xi AwfÁZv hvPvB Ki#eb Ôwi · vPvjK wK#mi m'v#h" wi · v Pvjv#Q?Ô Ôme wi · vPvjK wK mgMwZ#Z wi · v Pvjvb?Ô wky_v_xi AwfÁZvi Av#jv#K wkyK e'vL'v Ki#eb KvR Gi aviYv wky_v_xiv e'vL'v Ki#e Ges D`vniY w`#e Kv#Ri mv#_k³i m'úK Av#Q wKbv wky_v_xiv tei Ki#e Kxfv#e k³i Ges KvR ci'ú#ii c'iciK R#eb Nibô D`vniY w`#q wkyK e'vL'v Ki#eb Ôme gvb#li KvR Kivi mvg_ GK bqô weÁv#bi Av#jv#K wky_v_xiv GKwU`jMZ KvR m'úb K#i#e </li> <li>• k³i wefb i#c m'úK wky_v_x AwfÁZv eYbv Ki#e   ÔmBP Ab Ki#j ewZ R#j Ges d'vb Ni#Z_v#Kô G t'ÿ#t k³i tKv_v n#Z Av#m Ges k³i tKvb tKvb i#c AwefZ nq wky_v_xiv e'vL'v Ki#e Ges k³i i#cviš#ii g#a" m'úK vcb Ki#e   wkyK k³i i#cviš#i c`kb Ki#eb • wky_v_x k<sup>3</sup>i wefb i#cviš#ii D`vniY w`#e Ges Zv#`i ga"Kvi m'úK e'vL'v Ki#e   wkyK ev'e D`vniY w`#q k³i i#cviš#ii wefb NUbv e'vL'v Ki#eb   cevnwPÎ A#b K#i k³i i#cviš#ii cvi'úiiK m'úK e'vL'v Ki#eb   `jMZfv#e tKwY#Z k<sup>3</sup>i i#cviš#ii NUbvi g#a" cevnwPÎi m'v#h" m'úK vcb Ki#e wkyK wefb cKvi k<sup>3</sup>i i#cviš#i c`kb Ki#eb Ges Zv#`i g#a" m'úK vcb Ki#eb wky_v_x wefb cKvi k<sup>3</sup>i i#cviš#i c`kb Ki#e Ges Zv#`i g#a" m'úK vcb Ki#e	• tKwYi Kv#Ri wb`kK e'envi K#i`jMZ KvRwU gj`vqb Ki#eb </li> <li>• tKwYi KvR I e'enviK Kv#Ri wb`kK e'envi K#i KvRwU gj`vqb Ki#eb </li> <li>• wbaWiZ Kv#Ri wb`kK e'envi K#i KvRwU gj`vqb Ki#eb

mßg Aa'vq : k³ i e'envi (10 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb tkLv#bv wb'`kbv	gj'vqb wb'`kbv
4. bevbq#hvM' k³ i mweav l mxgve×Zv e'vL'v Ki#Z cvi#e 5. Abevbq#hvM' k³ i mxgve×Zv e'vL'v Ki#Z cvi#e 6. bevbq#hvM' k³ i Drm e'vL'v Ki#Z cvi#e 7. k³ i msiÿYkxjZv e'vL'v Ki#Z cvi#e 8. k³ msKU wvim#bi Dcvq e'vL'v Ki#Z cvi#e 9. Avgv#`i Rxe#b k<sup>3</sup> i c#qvRbxqZv eYbv Ki#Z cvi#e </p> <p><b>Av#eMxq</b></p> <p>10. k<sup>3</sup> i e'env#i wb#R m#PZb n#e Ges Ab'`i#K m#PZb Ki#e	• bevbq#hvM' l Abevbq#hvM' k³ - o mweav - o mxgve×Zv • bevbq#hvM' k³ i Drm - o DTM`R</li> <li>o cvYR</li> <li>o evq</li> <li>o cvib</li> <li>o mh</li> </ul> </li> <li>• k<sup>3</sup> i msiÿYkxjZv</li> <li>• k<sup>3</sup> i msKU Ges weKí k<sup>3</sup> i mÜvb</li> <li>• Avgv#`i Rxe#b k³ i cfve Ges Gi A_#bWZK e'envi	• wkÿv_x bevbq#hvM' Ges Abevbq#hvM' k³ i aviYv e'vL'v Ki#e wkÿK bevbq#hvM' Ges Abevbq#hvM' k³ i aviYv e'vL'v Ki#eb bevbq#hvM' k³ i mweav Ges Abevbq#hvM' k³ i mxgve×Zv wel#q wkÿv_x GKwU `jxq KvR tkwY#Z m#úb Ki#e </li> <li>• wkÿv_x bevbq#hvM' k<sup>3</sup> i D`vniY w`#e Ges tkb G_#jv bevbq#hvM' k<sup>3</sup> Zvi KvY e'vL'v Ki#e  weifb D`vni#Yi mwnv#h' wkÿK bevbq#hvM' k³ i Drm e'vL'v Ki#eb • k³ i i#cvš#i i D`vniY w`#q wkÿK k³ i msiÿYkxjZv e'vL'v Ki#eb • Ô#`vjbvq k<sup>3</sup> i i#cvš#i l k<sup>3</sup> i msiÿYkxjZv Kxfv#e cWZwôZ nq Ô wel#q tkwY#Z GKwU `jMZ KvR wkÿv_xiv m#úb Ki#e • Ôk³ i msKU wvim#b Ges weKí k³ i e'enviÔ wel#q GKwU `jMZ KvR tkwY#Z m#úb n#e  wkÿK wkÿv_xi Dc`vcvbi lci dWe`vK w`#eb • Ôk³ e'envi Kxfv#e Avgv#`i Rxe#bK cfweZ Ki#QÔ G wel#q GKwU KvR wkÿv_x ewo#Z m#úb Ki#e </li> <li>• Ô Kxfv#e wbi#c` l KvhKifv#e k³ i e'env#i wb#R m#PZb n#e Ges Ab'`i m#PZb Ki#eÔ wel#q `jMZfv#e tcv÷vi Askb Ki#e	• Aa'v#qi tkwY Afxÿv mRbkxj ck c×wZ#Z AbwôZ n#e

Aóg Aa`vq : kṭāi K_v

(9 wciqW)

wkLbdj	welqe	wkLb tkLvṭbv wḃt`kbv	gj`vqb wḃt`kbv
eṛxeḂxq 1. kṭāi `eṛkó` eYbv KiṭZ cviṭe 2. kṭā mĀvj b e`vL`v KiṭZ cviṭe 3. KṛVb,Zij I evqexq gva`tg kṭāi teṭMi Zjbv KiṭZ cviṭe </li> <li>4. cvYx Kxfvṭe kṭā ṭbṭZ cvq e`vL`v KiṭZ cviṭe </li> <li>5. kve`Zvi mṁgv Ges bṭqR e`vL`v KiṭZ cviṭe 6. kṭā Drcv`bKvix hṣ kṭā mṛóí KvíY e`vL`v KiṭZ cviṭe </li> </ol> <p><b>AvṭeMxq</b></p> <ol style="list-style-type: none"> <li>7. `ḃḃ`b Rxeṭb (bṭqR Ges `IY) kṭāi e`envṭii ṽZKi w`K mṁúṭK wḃR mṭPZb nṭe Ges Abṭ`i mṭPZb KiṭZ cviṭi </li> <li>8. `jMZ KvṭR mncvṬx`i e<sup>3</sup>e` ṭbṭe, mṁṁq Ask MnY Kiṭe Ges wṁxvš MnṭY mnṭhṁMZv KiṭZ cviṭe	• kṭā • kṭā mĀvj b • gva`tg kṭāi teM</li> <li>• cvYx Kxfvṭe kṭā ṭbṭZ cvq</li> <li>• kve`Zvi mṁgv Ges bṭqR • kṭā mṛóíKvix hṣ - o eṛk - o GKZviv ṭ`vZviv - o Mṁoi nb - o mṁBṭKj I ṽi · vi tej	• wkyv_xṭ`i Pvicṭk Drcb wṛfb iKg kṭāi D`vniY w`ṭZ ejṭeb Ges wkyv_xṭ`i tevṭW Gṭb D<sup>3</sup> D`vniY ṭ`ṭK mih<sup>3</sup> I mienRZ kṭā c_K KiṭZ ejṭeb wkyK AvṭjvPbvq dWe`vK w`ṭeb Ges Pvicṭki bṁbv iKg mih<sup>3</sup> I mienRZ mṁúṭK wkyv_xṭ`i aviYv m`úó Kiṭeb welṭq wkyv_xiv tkvYṭZ GKṁU `jMZ KvR mṁúb Kiṭe </li> <li>• kṭā Drcb nIqv mṁúṭK wkyv_xṭ`i Pvicṭki AṛfÁZv eYbv KiṭZ ejṭeb kṭā mṛóí Rb` kṭā DrcbKvix hṣi cṭqvRbxqZv Ges hṣ ev Drṭmi Kṁúṭbi mṭṭ kṭāi mṁúK RvṭZ Pṁṭeb  wkyK gṁb I wṛfb cvYxi kve`Zvi mṁgv mṁúṭK wkyv_xṭ`i aviYv m`úó Kiṭeb wkyv_x tkvYṭZ `jZfṭe KvR mṁúb Kiṭe </li> <li>• kṭā mĀvjṭbi Rb` Ro gva`tgi cṭqvRbxqZv Ges evqi ga` w`ṭq GK`vb ṭ`ṭK Ab`vṭb kṭā mĀvj b mṁúṭK wkyv_xṭ`i AṛfÁZv eYbv KiṭZ ejṭeb  GKUv jṁv w`ús wḃṭq wkyv_xṭ`iṭK w`úsṭqi GK cvṣ AṁNvZ KiṭZ ejṭeb Ges w`ús Gi wṛfZi w`ṭq mṭKvPb I cmviṭYi gva`tg Zi½vKvṭi kṭā³ i mĀvj b ṭ`Lṭeb Ges kṭā mĀvj b mṁúṭK wkyv_xṭ`i aviYv m`úó Kiṭeb wkyK tkvYṭZ kṭā mĀvj b c`kb Kiṭeb Ges wkyv_x c`kb Kiṭe • KṛVb, Zij I evqexq gva`tg kṭāi teM mṁúṭK wkyv_xṭ`i AṛfÁZv D`vniYmn eYbv KiṭZ ejṭeb  wkyK RxebNṁô D`vniY w`ṭq KṛVb, Zij I evqexq gva`tg kṭāi teṭMi wfbZv mṁúṭK wkyv_xṭ`i aviYv m`úó Kiṭeb • cvYx Kxfvṭe kṭā ṭbṭZ cvq ṭm e`vcvṭi wkyv_xṭ`i AṛfÁZv eYbv KiṭZ ejṭeb Ges kṭāi cṭZdj b mṁúṭK RvṭZ Pṁṭeb wkyK cvYxi kṭā ṭkvbv ṭKṣkj Dc`vcb Kiṭeb  G welṭq GKṁU eṛoi KvR wkyv_x mṁúb Kiṭe </li> <li>• ÔAṽZi³ Ges D`P kṭā Avgṭ`i Rb` ṽZKiô wkyv_xṭ`i AṛfÁZv I gZvgZ RvṭZ Pṁṭeb  Gṭṽṭ mṭPZb bṁmṁiK wṁṭmṭe Zvṭ`i wK KiYxq Zv RvṭZ Pṁṭeb wkyK AṽZi<sup>3</sup> I D`P kṭā Avgṭ`i Rb` Kxfvṭe ṽZKi Zv D`vniY w`ṭq e`vL`v Kiṭeb Ges mṭPZb bṁmṁiK wṁṭmṭe cṭievi I mgvṭR wkyv_xṭ`i `wqZ I KZe` mṁúṭK wḃt`kbv w`ṭeb G welṭq wkyv_x tkvYṭZ GKṁU `jxq KvR mṁúb Kiṭe	• tkvYi KvṭRi wḃt`kK e`envi Kṭi `jMZ KvRṁU gj`vqb Kiṭeb • tkvYi KvṭRi wḃt`kK e`envi Kṭi `jMZ KvRṁU gj`vqb Kiṭeb • wḃawiz KvṭRi wḃt`kK e`envi Kṭi `jMZ KvRṁU gj`vqb Kiṭeb • tkvYi KvṭRi wḃt`kK e`envi Kṭi `jMZ KvRṁU gj`vqb Kiṭeb • eṛoi KvṭRi wḃt`kK e`envi Kṭi `jMZ KvRṁU gj`vqb Kiṭeb • tkvYi KvṭRi wḃt`kK e`envi Kṭi `jMZ KvRṁU gj`vqb Kiṭeb • Aa`vṭqi tkvY Afxṽv mRbkj ck cxṽZṭZ AbṁôZ nṭe

beg Aa`vq : Zvc I Zvcgvîv (10 wciqW)

wkLbdj	welqe	wkLb tkLv#bv wb`kbv	gj`vqb wb`kbv
ewxexq 1. Zvc I Zvcgvîvi gta` cv_K` Ki#Z cvi#e 2. dv#ibnvBU Ges tmjwmqvm t`#ji gta` m#úK vcb Ki#Z cvi#e 3. _v#gwgUvi e`envi K#i m# f#e Zvcgvîv cwigvc Ki#Z cvi#e </p> <p>4. eqi Pvc I Av`Zvi e`vL`v Ki#Z cvi#e 5. eqi Pvc I Av`Zvi Dci Zvcgvîvi cfve w#kIY Ki#Z cvi#e </p> <p>6. c`v#_ Zvcxq m#úmvY e`vL`v Ki#Z cvi#e 7. Zvc mÂvj#bi c#mqv e`vL`v Ki#Z cvi#e 8. Pvic#k msNvUZ w#fb NUbq Zvc mÂvj#b e`vL`v Ki#Z cvi#e 9. w#KiK Ges tkvI#Ki gta` cv_K` Ki#Z cvi#e	• Zvc I Zvcgvîv • Zvcgvîvi w#fb t`#j</li> <li>• _v#gwgUvi e`envi • eqi Pvc I Av`Zv</li> <li>• G#`i Dci Zvcgvîvi cfve • Zvcxq m#úmvY - o KvVb - o Zij - o evqexq • Zvc mÂvj#b - o c#ienb - o c#iPjb - o w#KiY • w#KiK I tkvIK	• ev`e DcKiY e`envi K#i wkÿv_x#`i VvBv I Mig Abf#Zi A#fÁZv eYbv Ki#Z ejb Gi KvY w#kIY K#i Zvc I Zvcgvîvi cv_K` Z#j ai#Z cv#ib • wkÿv_x dv#ibnvBU I tmjwmqvm t`#j e`envi K#i Kÿ Zvcgvîvq cv#bi Zvcgvîv wBYq K#i Dfq t`#ji gta` cv_K` I m#úK wBYq Ki#e </li> <li>• _v#gwgUvi e`envi K#i Kv#mi Kgc#ÿ 10Rb wkÿv_x#`i kix#i Zvcgvîv wBYq Ki#e Ges gvb#I vfw#k Zvcgvîvi mv#_ Zj#v K#i m#vS MnY Ki#e </li> <li>• Zvc w`#j c`v#_i w#Kic c#ieZb nq wkÿv_x Zvi A#fÁZv eYbv Ki#e  Zv#ci cfv#e c`v_#Kb m#úmvY nq wkÿK e`vL`v Ki#eb wkÿK mnRj#` DcKiY e`envi K#i Zv#c c`v#_i m#úmvY cixÿY c`kb Ki#eb ck K#i wkÿv_x#`i c`v#_i m#úmvY e`vL`v Ki#Z ej#eb wkÿv_xiv Zv#c c`v#_i m#úmvY c`kb Ki#e • mÂvj#b m#ú#K wkÿv_x A#fÁZv eYbv Ki#e wkÿK Zvc mÂvj#b m#ú#K wkÿv_xi aviYv mmsnZ Ki#eb wkÿv_x c`v#_i Zvcxq m#úmvY#i aviYvi Av#j#K Zvc mÂvj#b e`vL`v Ki#e  Pvic#k msNvUZ wKQ NUbv D#jL K#i Zv#Z Zvc mÂvj#bi KvY D`NvU#bi Rb` wkÿv_xiv`jxq KvR m#úv Ki#e	• tk#Yi Kv#Ri wb`kK e`envi K#i`jMZ KvRvU gj`vqb Ki#eb • w#av#iZ Kv#Ri wb`kK e`envi K#i`jMZ KvRvU gj`vqb Ki#eb • tk#Yi KvR I e`enviK Kv#Ri wb`kK e`envi K#i`jMZ KvRvU gj`vqb Ki#eb </li> <li>• tk#Yi KvR I e`enviK Kv#Ri wb`kK e`envi K#i`jMZ KvRvU gj`vqb Ki#eb • Aa`v#qi tk#Y Afxÿv mRbk#j ck c#vZ#Z Ab#ôZ n#e

kg Aa'vq : we''r I Pa#Ki NUbv (11 wciqW)

wKLbdj	welqe	wKLb tkLv#bv wb`kbv	gj`vqb wb`kbv
ewEeq 1. P#Ri ag e'vL'v KiZ cvi#e 2. c#ievnx, Ac#ievnx Ges Aac#ievnx e'vL'v KiZ cvi#e 3. w' i we''r m#o gva'tg P#Ri ag c`kb KiZ cvi#e </li> <li>4. w' i we''r n#Z Pj Z#or m#oi aviYv e'vL'v KiZ cvi#e </li> <li>5. GK#U mij eZbx ^Z#i KiZ cvi#e </li> <li>6. wBZ'' e'envh hšc#vZ#Z we''#Zi e'envi e'vL'v KiZ cvi#e </li> <li>7. Pa#Ki ag c`k#bi gva'tg tPš#K I A#Pš#K c`v#_i g#a' cv_K'' KiZ cvi#e	• P#R • c#ievnx, Ac#ievnx Ges Aac#ievnx • w' i we''#Zi c`kb</li> <li>• w' i we''r n#Z Pj we''r m#o</li> <li>• mij eZbx Ges Gi e'envi</li> <li>• w' i I Pj we''#Zi e'envi <ul style="list-style-type: none"> <li>o d#UvK#ic tg#kb</li> <li>o w#Uvi</li> <li>o ewZ</li> <li>o UP j#vBU</li> <li>o B#</li> <li>o d`vb • Pa#K, tPš#K I AP#K c`v_	• we''r Ges tPš#K I NUbv R#vbi Rb'' cigvYi Mvb R#bv c#qvRb Zv e'vL'v Ki#eb • cigvY g#a'' abvZ#K P#R i#t# c#Uvb th tK#` _v#K Ges FYvZ#K P#Ri#t# B#j#b we'fb K#y _v#K G #P# i#k#YK Z#j ai#eb </li> <li>• c#ievnx, Ac#ievnx Ges Aac#ievnx D`vniYmn e'vL'v Ki#eb • w#y_v_x Zvi ewo/evmvi we'fb e`#K c#ievnx, Ac#ievnx Ges Aac#ievnx#Z t#vYKiY Ki#e Ges Kvib e'vL'v Ki#e </li> <li>• NI#Yi gva'tg P#R m#oi cix#vi m#v#h'' mgRvZ#q P#Ri g#a'' AvKIY Ges wecixZ RvZ#q P#Ri g#a'' weKIY c`kb Ki#eb • w#y_v_xiv NI#Yi gva'tg P#R m#oi cix#vi m#v#h'' mgRvZ#q P#Ri g#a'' AvKIY Ges wecixZ RvZ#q P#Ri g#a'' weKIY c`kb Ki#e </li> <li>• GK#U av#K#K P#RZ K#i Gi g#a'' w' i we''#Zi aviYv e'vL'v Ki#eb Ges av#K#i `B cvš#K GK#U UP j#vB#Ui ev#j m#h#M K#i Av#jv Rv#v#e Ges GB NUb#t#K w' i Z#or n#Z Pj Z#or m#o NUbvi#t# c' e'vL'v Ki#eb • w#y_v_xiv w' i Z#or n#Z Pj Z#or m#o NUbv c`kb Ki#e </li> <li>• GK#U e'vU#i, P#we, c#ievnx Zvi Ges U#Pi evj e'envi GK#U mij eZbx i KvR c`kb Ki#eb • we''r cev# Øviv Av#jv I Z#v Drcv`b I h#šK KvR w#m#e cvLv Niv#bv hvq Zvi `ovš Z#j a#i we''#Zi b#bv e'envi w#yK c`kb Ki#eb Ges e'vL'v Ki#eb  Q#ei m#v#h'' d#UvK#ic tg#kb w' i we''r e'envi K#i Kxfv#e d#UvK#ic Kiv nq e'vL'v Ki#eb  [m#e n#j w#y_v_x#` i w#tq t`Lv#eb ]</li> <li>• w#y_v_x Pa#K, tPš#K I AP#K c`v_ m#u#K Zv#` i A#fÁZv eYbv Ki#e  w#yK Pa#K, tPš#K I AP#K c`v_ m#u#K e'vL'v Ki#eb w#y_v_x Pa#K, tPš#K I AP#K c`v#_i cv_K'' c`kb Ki#e	• ewoi Kv#Ri w#t`kK e'envi K#i KvR#U gj`vqb Ki#eb • t#vYi KvR I e'envi K Kv#Ri w#t`kK e'envi K#i `jMZ KvR#U gj`vqb Ki#eb </li> <li>• t#vYi KvR I e'envi K Kv#Ri w#t`kK e'envi K#i `jMZ KvR#U gj`vqb Ki#eb

kg Aa'vq : we''r I Pa#Ki NUbv (11 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb tkLv#bv wb#`kbv	gj''vqb wb#`kbv
8. A#PaK c`v_#K tPa#K cwiYZ Kivi cμqv c`kb Ki#Z cvi#e 9. ^e''wZK PaK e''vL'v Ki#Z cvi#e 10. c_exi tPaK tÿî e''vL'v Ki#Z cvi#e Av#eMxq 11. Avg#`i Rxe#b we''r I Pa#Ki Ae`vb Dc jwä Ki#Z cvi#e 12. cixY Kv#μtg mZZv, k•Ljv, wbgvberZZv Ges wbi#cYzv eRvq ivL#Z cvi#e 13. `jMZ Kv#R mncW#`i e³e'' i#b#e, mμq Ask MnY Ki#e Ges wmxvš MnY mn#hwmZv Ki#Z cvi#e	• tPaK c`v_#K Pa#K i#cvi • ^e''wZK PaK • c_exi tPaK tÿî	• wkyK tPaK c`v_#K Pa#K i#cvi cμqv e''vL'v Ki#eb  wkyK tPaK c`v_#K Pa#K i#cvi cμqv tkwY#Z c`kb Ki#eb  wky_v_x tkwY#Z tPaK c`v_#K Pa#K i#cvi cμqv tkwY#Z c`kb Ki#e </li> <li>• wkyK tPaK tÿî i aviYv e''vL'v Ki#eb  c_exi tPaK tÿî D`niY w`#q e''vL'v Ki#eb  G wel#q tkwY#Z GKU KvR wky_v_x `jMZfv#e maub Ki#e • GKU w`M`kb h` e'envi K#i Pa#Ki D#i tgi# D#i w`#K N#i, c_ex#K GKU PaK Kíbv K#i wkyK e''vL'v Ki#eb • `jMZ KvR wnt#e wky_v_xiv GK#î c_exi PaK#Zi GKU g#Wj %Zi Ki#e  k³ KVMR w`#q GKU tMe ^Zi Ki#e tK#` Aÿ eivei GKU `ð PaK vcb Ki#e Pa#Ki D#i tgi# n#e t#MwjK `wY tgi# i#c KvR Ki#e  kjvKv Pa#Ki mnv#h` Kîlg c_exi PaKZ ag c`kb Ki#e </li> <li>• ô we''r I PaK Kxfv#e Avg#`i Rxe#b bvbv tÿî Ae`vb ivL#Qô G wel#q GKU c#Z#e`b ewoi KvR wnt#e maub Ki#e	• tkwYi KvR I e'enviK Kv#Ri w#`kK e'envi K#i `jMZ KvRU gj''vqb Ki#eb • tkwYi KvR I e'enviK Kv#Ri w#`kK e'envi K#i `jMZ KvRU gj''vqb Ki#eb • tkwYi Kv#Ri w#`kK e'envi K#i `jMZ KvRU gj''vqb Ki#eb • ewoi Kv#Ri w#`kK e'envi K#i `jMZ KvRU gj''vqb Ki#eb • Aa`vqi tkwY Afxyv mRbkj ck cx#Z#Z AbiôZ n#e

GKv`k Aa`vq : cwiicwkk cwieZb Ges wefb NUbv (11 wciqW)

⚡kLbdj	⚡elqe	⚡kLb tkLvfbv ⚡b`kbv	gj`vqb ⚡b`kbv
⚡xeExq 1. cKizZ msNivZ wefb NUbvi t\$Z I ivmqibK cwieZb e`vL`v KiZ cvi`e </p> <p>2. avZ msi`yYi c`qvRbxqZv Dcjrä KiZ cvi`e 3. ivmqibK ⚡mqv Ges cwieZbi ⚡KQ e`enwiK c`qvM t`LvZ cvi`e	- Mjb I ùUb - avZi `yq</li> <li>`nb (Ro I Rxe) - mv`jvKms`kIY - cwb Pμ - Kveb Pμ - A⚡ · `Rb Pμ	⚡ky`x `jMZfvte Mjb I ùUb Kx ai`bi cwieZb ⚡ky`x D`vniY ⚡`tq e`vL`v Ki`e </li> <li>tjvni `Zwi `e`w`i mv` Ab`vb` avZ `Zwi `e`w`i g`a` Kx ai`bi cv`K` t`Lv hvq ⚡ky`x AfÁZvi Av`jvK eYbv Ki`e </li> <li>avZ tKb I Kxfvte `yq cvB nq Ges GwU Kx ai`bi cwieZb ⚡ky`K Db<sup>3</sup> Av`jvPbv i mvn`th` ⚡ky`xi aviYv mmsnZ Ki`eb </li> <li>tjvni mv` evq I cwb i ⚡mqv Ges Gi djvdj e`vL`v Ki`eb  t÷Bb`jm Gi A_ e`vL`v Ki`eb </li> <li>t÷Bb`jm Gi mv` evq I cwb i ⚡mqv Ges tKb G`Z avZi `yq ev gwiPv cto bv e`vL`v Ki`eb ⚡ky`xi evmq/ewo`Z e`eüZ wefb avZe e`i GKwU ZwjKv `Zwi Ki`e, G,`jv Kte μq Kiv n`q`Q Zvi ZwiL bv`gi cv`k ⚡jLte Ges Zv`i g`a` gwiPv ev `yq n`q`Q ⚡Kbv chte`yY Ki`e Ges `e`w` m`aú`K g`se` Ki`e </li> <li>⚡ky`x tjvni Ges t÷Bb`jm Gi c`v`_tK Db³ `v`b ti`L `te thLv`b c`v` mgn cwb I evqi ms`ú`k Avm`Z cv`i tek ⚡KQ`b Gfvte ivLvi ci G`i`i ewn`K cwieZb chte`yY Ki`e Ges KviYmn g`se` Ki`e </li> <li>ÓavZ msi`yYi cwie`i i m`m`i`i Kxfvte m`PZb Ki`eð ⚡el`q GKwU ewoi KvR m`aú`b Ki`e ⚡ky`x `nb m`aú`K AfÁZv eYbv Ki`e </li> <li>`n`bi wefb NUbv D`jL K`i ⚡ky`K `nb e`vL`v Ki`eb `n`bi d`j Kx N`U e`vL`v Ki`eb  `nb Kx ai`bi cwieZb KviYmn e`vL`v Ki`eb - Ógvb`li Rxe`b Zvc k<sup>3</sup> i fvgKv I `nbð ⚡el`q tKv`Z `jMZ KvR m`aú`b Ki`e </li> <li>mv`jvKms`kI`Y Kx N`U ⚡ky`x Zv`i AfÁZv eYbv Ki`e Ges GwU Kx ai`bi cwieZb h³ `te ⚡ky`K P`U/te`W Pμ G`K cwbPμ, Kveb Pμ Ges A⚡ · `Rb P`μ i wefb Ask e`vL`v Ki`eb </li> <li>⚡ky`x `jMZfvte cwbPμ, Kveb Pμ Ges A⚡ · `Rb P`μ Kx ai`bi cwieZb N`U h³ mn e`vL`v Ki`e ⚡ky`x `jMZfvte mv`jvKms`kIY, Kveb Pμ Ges A⚡ · `Rb Pμ G`K A`b`i Dci ⚡bfikxj G ⚡el`q h³ `te	- tKvYi KvR Kv`Ri ⚡b`kK e`envi K`i gj`vqb Ki`eb - e`enwiK Kv`Ri ⚡b`kK e`envi K`i gj`vqb Ki`eb </li> <li>ewoi Kv`Ri ⚡b`kK e`envi K`i `jMZ KvRwU gj`vqb Ki`eb - tKvYi Kv`Ri ⚡b`kK e`envi K`i `jMZ KvRwU gj`vqb Ki`eb </li> <li>tKvYi Kv`Ri ⚡b`kK e`envi K`i `jMZ KvRwU gj`vqb Ki`eb - tKvYi Kv`Ri ⚡b`kK e`envi K`i `jMZ KvRwU gj`vqb Ki`eb

WkLbdj	weiqe	WkLb tkLv#bv Wb#`kbv	gj`vqb Wb#`kbv
g#bv#cikR 4. cixY Kvhμtg e`eüZ hšcwZ mVkfve e`envi KiZ cvi AvteMxq 5. `jMZ KvR mncWx`i e³e` İbte, mμq AskMnY KiGe Ges m×vš MnY mnthwMZv KiZ cvi </p> <p>6. cixY Kvhμtg cqvRbxq WbivcEvgjK e`e`v MnY mPZb _vKGe Ges Ab`i mPZb KiZ cvi	• g`vM#bμmqv I evqi`nb • Kve#bU thšM I Gm#Wi weμqv • avZ I Gm#Wi weμqv • Wkjv Mvb cμqv	• WkYK tkY#Z g`vM#bμmqv I evqi`nb, Kve#bU thšMi mv#_ Gm#Wi weμqv Ges avZ I Gm#Wi weμqv c`kb KiGe Ges e`vL`v KiGe G#Z Kx ai#bi cwieZb N#U </li> <li>• WkYv_x tkY#Z g`vM#bμmqv I evqi`nb, Kve#bU thšMi mv#_ Gm#Wi weμqv Ges avZ I Gm#Wi weμqv c`kb KiGe Ges h³mn cwieZb, #jv e`vL`v KiGe • WkYK Wkjv Mvb cμqv e`vL`v KiGe WkYv_x e`vL`v KiGe Gu Kx ai#bi cwieZb	• tkYi KvR I e`enviK KvRi Wb#`kK e`envi K#i`jMZ KvR#U gj`vqb KiGe </li> <li>• <b>Aa`vqi tkY AfYv mRbkj ck cWZ#Z AbôZ n#e

Øv`k Aa`vq : tmsiRMZ I Avgv`i cwi_ex (8 wciqW)

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv
eixE`xq</b></p> <p>1. tmsi RMtZi MVb e`vL`v KiZ cvite </p> <p>2. tmsi RMtZi m`m`i tfSZ `ewkó` Zjv KiZ cvite </p> <p>3. cwi_exi NYtbi cfve Ges Gi d`j m`o djvdj e`vL`v KiZ cvite </p> <p><b>gbv`cirkR 4. tmsi RMtZi MVb KvWt`gvi wPÎ A`b KiZ cvite AvteMxq 5. Rxe RMtZ cwi_exi NYtbi cfve Dc`j`ä KiZ cvite	- tmsi RMtZi MVb - tmsi RMtZi m`m`i cwiPq - Av`yK MZ I ew`IK MZ Ges Gt`i cfve	- tmsi RMZ m`u`K wk`v_x Zv`i A`fÁZv eYbv KiZ  tmsiRMtZi MVb LvZvq A`b KiZ wk`yK tmsi RMtZi MVb wPÎi gva`g c`kb KiZeb Ges e`vL`v KiZeb  wk`v_xi aviYv `úó KiZeb  wk`v_x tcv`vi tccv`i/LvZvq tmsiRMtZi wPÎ A`b KiZ </li> <li>mh,cwi_exmn ew`fb M`ni Ae`vb wel`q wk`v_x A`fÁZv eYbv KiZ </li> <li>wk`yK wPÎi m`v`q` mh,cwi_exmn tmsi RMtZi m`m`i Ae`vb e`vL`v KiZeb Gt`i tfSZ `ewkó` eYbv KiZeb  wk`v_x `jMZfvte tk`YtZ tmsi RMtZi ew`fb m`m`i Ae`vb wPÎi m`v`h` c`kb KiZeb Ges Zv`i tfSZ `ewkó`i Zjv KiZeb </li> <li>Øv`b I iv`Î Kxfvte wdti Av`m` wk`v_x A`fÁZv eYbv KiZ  cwi_exi MZ m`u`K wk`v_x A`fÁZv eYbv KiZeb  wk`yK cwi_exi NYb wPÎ e`envi Kt`i e`vL`v KiZeb cwi_exi Av`yK MZ Ges ew`IK MZ e`vL`v KiZeb cwi_exi NYtbi djvdj e`vL`v KiZeb fc`ói Zvcg`v`i e`vL`v KiZeb </li> <li>cwi_exi NYtbi djvdj Kxfvte RxeRMtK cfweZ Kt`i tm GKU `jMZ KvR tk`YtZ m`u`b KiZeb - ewoi KvR wntmte wk`v_x tmsi RMtZi MVb KvWt`gvi wPÎ tcv`vi tccv`i A`b KiZeb </li> <li>Øcwi_exi NYtbi djvdj Kxfvte tZvg`K Ges tZvgvi cwi`v`i m`m`i cfweZ Kt`Q tm Abf`Z e`³ Kt`i GKU ewoi KvR wk`v_x m`u`b KiZeb	- tk`Yi KvRi wb`kK e`envi Kt`i A`bU gj`vqb KiZeb - ewoi KvRi wb`kK e`envi Kt`i `jMZ KvRU gj`vqb KiZeb </li> <li>GB Aa`vq tk`I mRbk`j c`vZ`Z GKU tk`Y Af`x`v Abi`Z nte

Gəqə`k Aa`vq : cəKəZK cəi`teK Ges `IY (10 əCəiqW)

əKLbdj	əelqe	əKLb tKLv`bv əb`kbv	gj`vqb əb`kbv
əxəE`xq</b></p> <p>1. cəi`teK `IY ə`vL`v Ki`Z cəi`te </p> <p>2. cəi`te`ki Dcv`vbmgnəi `I`Yi KviY ə`vL`v Ki`Z cəi`te 3. cəi`te`ki Dcv`vbi Dci `I`Yi cfve ə`vL`v Ki`Z cəi`te </p> <p>4. cəi`teK `IY cəZ`iv`tai Dcvq ə`vL`v Ki`Z cəi`te </p> <p><b>gbv`cəkR 5. cəi`teK `IY Ges Gi cfve tcv÷v`ti Dc`vcb Ki`Z cəi`te Av`teMxq</b></p> <p>6. cəi`teK msi`y`Y mgyR m`PZbZv m`óZ D``VMx n`te	- cəi`teK `IY - cəi`te`ki Dcv`vbmgnəi `I`Yi KviY <ul style="list-style-type: none"> <li>gwU</li> <li>cwb</li> <li>evq</li> </ul> </li> <li>cəi`te`ki Dcv`vbi Dci `I`Yi cfve `IY cəZ`iv`tai Dcvq	`IY Gi Dci ək`y`x AfÁZv eYbv Ki`te, Gi mvt` cəi`teK `IY`K m`óU`KZ Ki`te </li> <li>cəi`te`ki Dcv`vbi ej`Z Kx eSvq ək`y`x eYbv Ki`te - cəi`te`ki Dcv`vbmgnəi `I`Yi KviY ev`e D`vniY ə`tq eYbv Ki`teb </li> <li>Ôk`y`xi GjvKvq/əe`vj`q K`v`v`v`m Kxfv`te cəi`te`ki Dcv`vbmgn `IZ n`QÔ əel`q GKU əbaw`IZ KvR `jxqfv`te m`óU Ki`te </li> <li>`I`Yi Kvi`Y cəi`te`ki Dcv`vbmgn Kxfv`te y`ZM` n`Q ə`vL`v Ki`teb - gwU, cwb l evqi `IY Kxfv`te cvYx Ges Dn`TM` Z`v Rx`tei `vfweK KgKv`D`K cfweZ Ki`Q Zv ə`vL`v Ki`teb </li> <li>Ôcəi`te`ki Dcv`vbmgnəi `IY Ges Gi djvdjÔ əel`q ək`y`x `tj f`gKwfbq K`i c`kb Ki`te </li> <li>Ô`IY cəZ`iv`tai tK`skjÔ tcv÷vi tccv`i c`kb Ki`teGes ək`y`K əe`vj`q c`k`bi e`e`v Ki`teb </li> <li>cəi`teK msi`y`Y GKKfv`te tcv÷vi A`b Ki`te Ges əe`vj`q c`k`bi e`e`v ək`y`K Ki`teb	tK`Yi Kv`Ri əb`kK e`envi K`i gj`vqb Ki`teb </li> <li>AbmÜvbgjK Kv`Ri əb`kK e`envi K`i gj`vqb Ki`teb </li> <li><b>Aa`v`qi tK`Y Af`y`v mRbkxj ck cx`Z`Z Ab`ôZ n`te

PZ`k Aa`vq : Rjevq cwieZb

(8 cwiqW)

¶kLbdj	¶elqe	¶kLb ¶kLv¶bv ¶b¶`kbv	gj`vqb ¶b¶`kbv
¶¶eE¶q			
1. evqgÛ¶ji ¶¶fb ¶i eYbv Ki¶Z cvi¶e	• evqgÊ¶ji ¶¶fb ¶i	• ¶P¶Î (g¶¶Ëg¶Wqvq) evqgÛ¶ji ¶¶fb ¶i c`kb Ges Db¶³ c¶kvÊ¶ii gva`tg ¶i m¶ú¶K Av¶jvPbv	• ¶k¶Yi Kv¶Ri ¶b¶`kK e`envi K¶i gj`vqb Ki¶eb
2. c¶i¶e¶k cwb Pµ, A¶ · ¶Rb Pµ I Kveb P¶µi , i¶Z e`vL`v Ki¶Z cvi¶e	• cwb Pµ, A¶ · ¶Rb Pµ I Kveb P¶µi , i¶Z	• GKKfv¶e evq`¶ii ¶P¶Î¶b Ges c¶Z`K ¶¶ii ^e¶kó¶ I , i¶Z eYbv Kiv	• AbmÜvbgjK Kv¶Ri ¶b¶`kK e`envi K¶i gj`vqb Ki¶eb
3. AvenvIqv I Rjevq e`vL`v Ki¶Z cvi¶e	• AvenvIqv I Rjevq	• c¶kvÊ¶ii gva`tg c¶i¶e¶ki fvimvg¶ i¶¶vq cwb Pµ, A¶ · ¶Rb Pµ I Kveb P¶µi , i¶Z m¶ú¶K Av¶jvPbv	
4. DòZv e¶¶i m¶¶_ Rjevq cwieZb e`vL`v Ki¶Z cvi¶e	• DòZv e¶¶i I Rjevq cwieZb	• `jxq Av¶jvPbvq , i¶Z Dc`vcb	• Aa`v¶qi ¶k¶Y Afx¶v mRbkxj ck cx¶Z¶Z Ab¶ôZ n¶e
5. Rjevq cwieZ¶bi Kv¶Y e`vL`v Ki¶Z cvi¶e		• c¶kvÊ¶ii gva`tg AvenvIqv I Rjevqi aviYv `vb	
		• Rjevq cwieZ¶b fcô msjM evq`¶ii cwieZb ¶iL¶P¶Îi gva`tg c`kb	
		• ¶Mb nvDR c¶Zi¶µqv I ^e¶kK DòZv e¶¶i m¶úK `jxqfv¶e Av¶jvPbv K¶i Dc`vcb	
		• ¶Riovq KvR Kivi gva`tg Rjevqi Dcv`vb I Rjevq cwieZ¶bi Kv¶Y m¶ú¶K LvZvq ¶j¶L Dc`vcb	

9. $\mathbb{R}^n$ ۛۛۛۛ ۛۛ

Aóg †kۛY

c_g Aa'vq : cṡYRMṡZi ṡkṡYṡeb'vm (8 ṡcṡiqṡ)

ṡkLbdj	ṡelqe	ṡkLb ṡkLvṡbv ṡbṡ'kbv	gj'vqb ṡbṡ'kbv
ṡṡṡṡṡṡ 1. Aṡgiṡ`Êx cṡYxi ṡkṡYṡeb'vm KiṡZ cṡiṡe	Aṡgiṡ`Êx cṡYxi cṡfṡĖK ṡkṡYṡeb'vm I ṡṡkó	- ṡkÿK ṡkṡY Kṡÿ Aṡgiṡ`Êx cṡYxi (ṡṡjKṡg, hKZ Kṡg, nṡBW, ṡKṡPv, Avṡkvjv, ṡSbK/ kvgK, Zviv gṡQ BZ'ṡṡi) PṡU ṡṡṡL Gṡṡi ṡṡṡṡK ṡṡkó eYbv KiṡZ ejṡeb  ṡkÿv_ṡṡi eYbvṡ ṡfṡĖZ ṡkÿK Zṡṡi ṡṡfb cṡei mṡaviY ṡṡkó, ṡjv AvṡjvPbv Kṡi Gṡṡi ṡkṡYṡeb'vmMZ Aeṡvb DṡjL Kiṡeb </li> <li>ṡkÿv_ṡ GKKfṡṡe Aṡgiṡ`Êx cṡYxi, ṡjvi PṡUi ṡPĹ ṡṡṡL Zṡṡi ṡṡṡṡK ṡṡkó, ṡjv LvZṡq ṡjLṡṡe Ges ṡkṡYṡZ Dcṡvcb Kiṡe Dcṡvcb ṡkṡṡ ṡkÿK ṡdWeṡvK ṡṡṡeb - ṡkÿv_xiv ṡṡṡṡ ṡṡṡq ṡṡU Aṡgiṡ`Êx cṡYxi gṡṡ cṡ_K ṡjLṡe ṡkÿv_ṡṡi KṡR ṡkṡṡ ṡkÿK ṡdWeṡvK ṡṡṡeb - ṡṡoi KṡR ṡṡṡṡṡṡ ṡkÿv_xiv cṡZṡU cṡei cṡYxi bvg I ṡṡkó ZṡṡjKṡKṡi ṡjṡL Avṡṡe ṡṡoi KṡR ṡkṡYKṡÿ Dcṡvcb Kivi ci ṡkÿK ṡdWeṡvK ṡṡṡeb	- ṡkṡYi KṡṡRi ṡbṡ'kK ṡṡṡṡ Kṡi gj'vqb Kiṡeb - ṡṡoi KṡṡRi ṡbṡ'kK ṡṡṡṡ Kṡi gj'vqb Kiṡeb Aa'ṡqi ṡkṡY Afṡÿv mRbṡj ck cṡṡZṡ AbṡôZ ṡṡe
2. ṡgiṡ`Êx cṡYxi ṡkṡYṡeb'vm KiṡZ cṡiṡe	- ṡgiṡ`Êx cṡYxi - o grṡṡ - o DfPi - o mṡmc - o cÿx - o ṡṡ'cṡqṡ	- ṡkÿK ṡkṡYKṡÿ ṡgiṡ`Êx cṡYxi (gṡbl, ṡṡṡ, ṡUKṡUṡK, cṡṡL gṡQ) PṡU ṡṡṡṡq Gme cṡYxi ṡelṡq ṡkÿv_ṡṡi ṡṡfÁZṡ eYbv KiṡZ ejṡeb  ṡkÿv_ṡṡi eYbvṡ AvṡjṡK ṡkÿK ṡgiṡ`Ûx cṡYxi ce I ṡkṡYi mṡaviY ṡṡkó ṡṡṡṡ Kiṡeb - ṡkÿv_xiv LvZṡq cṡYxi, ṡjvi ṡṡU Kṡi ṡṡṡṡK ṡṡkó ṡjLṡṡe Ges ṡkṡYṡZ Zṡ Dcṡvcb Kiṡe Dcṡvcb ṡkṡṡ ṡkÿK ṡdWeṡvK ṡṡṡeb - ṡṡoi KṡR ṡṡṡṡṡṡ ṡkÿv_xiv Zṡi Avṡk cṡṡki ṡṡfb cṡYxi ṡṡZ cṡZṡU ṡkṡYi ṡṡU Kṡi ṡgiṡ`Êx cṡYxi bvg I Zṡṡi ṡṡkó ṡjṡL Avṡṡe ṡkṡYṡZ Dcṡvcb ṡkṡṡ ṡkÿK ṡdWeṡvK ṡṡṡeb	
3. RṡRMṡZi ṡkṡYṡeb'ṡṡmi cṡqṡRbṡqZṡ ṡṡṡṡ KiṡZ cṡiṡe	RṡRMṡZi ṡkṡYṡeb'ṡṡmi cṡqṡRbṡqZṡ	ṡkÿv_xiv ṡjMZfṡṡe AvṡjvPbv Kṡi RṡRMṡZi ṡkṡYṡeb'ṡṡmi cṡqṡRbṡqZṡi Dci GKṡU cṡZṡṡṡ ṡṡZṡi Kṡi Kṡṡm Dcṡvcb Kiṡe	

«ØZıq Aa`vq : Rxe eı× I eskMıZ

(12 «cııqW)

«kLbdj	«elqe	«kLb tkLv#bv «b#`kbv	gj`vqb «b#`kbv
1 tkvl «efvR#bi cKvi#f` e`vL`v Ki#Z cvi#e	• tkvl «efvRb • tkvl «efvR#bi cKvi#f`	• tqvU Priv M#Qi D`vniY «`#q Priv MıQ Kxfv#e ax#i ax#i eo Dı#` cııYZ nq Zv «k#v_x#`i Kv#Q Rvb#Z PvB#eb Ges tkvl «efvRb m#ıÜ aviYv c`vb Ki#eb </li> <li>• tkvl «efvRb KZfv#e n#Z cv#i Zv «PÎ G#K e`vL`v Ki#eb • «k#v_xiv «k#iKi mv#_mv#_«efb ai#bi tkvl «efvR#bi «PÎ AsKb Ki#e	• tkıYi Kv#Ri «b#`kK e`envi K#i gj`vqb Ki#eb </li> <li>• ewoi Kv#Ri «b#`kK e`envi K#i gj`vqb Ki#eb
2 tkvl «efvR#bi gva`tg Rxe t`#ni eı× e`vL`v Ki#Z cvi#e	• tkvl «efvR#bi gva`tg Rxe#`#ni eı×	• gvb#li M#qi i0, AvKvi, MVb BZ`w` «efb nıqvi KviY «k#v_x#`i Kv#Q Rvb#Z PvB#eb  eev g#qi mv#_Zv#`i Kx Kx «gj Av#Q Zv Rvb#Z PvB#eb Gici GB «g#ji KviY e`vL`v Ki#Z th#q tıv#g#Rıg, «WGbG I AviGbG m#ı#K Av#jvPbv Ki#eb Ges eskMıZ#Z tıv#g#Rıg I tkvl «efvR#bi fıgKv m#ı#K aviYv «`#eb	• GB Aa`vq tk#I mRbkxj ck c#ıZ Abmi#Y GKıU tkıY Afx#v AbıôZ n#e
3 cvYxi eskMıZi aviv i#vq tkvl «efvR#bi fıgKv e`vL`v Ki#Z cvi#e	• cvYxi eskMıZi aviv i#vq tkvl «efvRb - o «Rb - o tıv#g#Rıg	AbmÜvbgj K KvR • «k#iKi «b#`kbv Abhvqı gvb#li M#qi i0, tP#Li i0, P#ji i0, D#PZv, bıx/ci#l Gme ^ek#ó`i Av#jv#K QK AvKv#i cıZıU «k#v_x cııev#iı m`m#`i Z_` msMn Ki#e  c#i Kv#m 5/6 R#bi `#j fıM n#q mevi Z_` GKıÎZ K#i GB cvPıU ^ek#ó`i «fı#E#Z KZRb K#i gıvı cvııqı tıMj Zv `jxqfv#e Dc`vcb Ki#e «k#K Gme ^ekó` e`ı³ n#Z e`ı<sup>3</sup>#Z c_K tkb Zvi e`vL`v c`vb Ki#eb	

ZZxq Aa'vq : e'vcb, Aif'eb Ges c'`b (9 wciqW)

⚡Lbdj	⚡lqe	⚡Lb tKlvb'v ⚡b'`kbv	gj'vqb ⚡b'`kbv
⚡xēĒq 1. e'vcb c⚡μqv e'vL'v KiZ cvite 2. Aif'eb c⚡μqv e'vL'v KiZ cvite 3. c'`b c⚡μqv Dᵐᵐ' i cwb ciz'vM e'vL'v KiZ cvite 4. Dᵐᵐ' cwb tKvIY e'vL'v KiZ cvite	- e'vcb - Aif'eb c'`b - o aviYv - o ,iZ - o crite#ki Dci cfve - cwb I LwR jeY tKvIY I crenb	- tKlv mMÜ ev `MÜ Kxfvte eS'Z cvfi A_ev ⚡Pib ev ,o ⚡'q ^Zi kieZ Kxfvte ᵐᵐó nq tm Aif'ÁZv ⚡k'v_x'`i KvQ Rvb'Z PvB'eb ⚡k'v_x'`i DĒ'ii Av'jv'K D`niY ⚡'q e'vcb c⚡μqv e'vL'v KiZeb - mvgv' c'igvY ZZ ev bxj GKU KvPi Mvfm cwb ⚡b'q Zv'Z tX'j ⚡'eb ⚡k'v_x'`i Mvfm cwb chēy'Y K'i ⚡K c'ieZb n'jv Zv LvZvq ᵐjLte  ⚡k'v_x'`i gš'ē' i Av'jv'K ⚡k'YK e'vcb c⚡μqv m'Ü aviYv c`vb KiZeb </li> <li>⚡k'v_x'`i cv'qm/di'ib'Z ⚡Kᵐᵐᵐ t`lqv Av'Mi I c'ii Ae'vq Aif'ÁZv eYbv KiZ ej'eb  ⚡k'v_xiv Aif'ÁZv eYbv Ki'j ⚡k'YK GiKg tKb N'U Zv m'ýß AvKv' i e'vL'v K'i Aif'eb c⚡μqv eYbv t`eb - ewoi KvR ᵐnt'ē ⚡k'v_xiv e'vcb I Aif'eb c⚡μqv cv_K' ᵐj'L G'b Kvfm Dc'vcb KiZeb Dc'vcbv tK' i ⚡k'YK ᵐdWe'vK ⚡'eb cix'vgjK KvR ⚡k'Y'Ki ⚡b'`kbv Abhvqx ⚡k'v_xiv Kvfm Avj ⚡b'q Avm'eb  Avj'K ᵐQ'j Qi ⚡'q tK'U ᵐPKb I j'v AvKv' i mvgv m'vB'ri `B UKiv KiZeb Gi GKU UKiv Mvfm cwb'Z Ab' UKiv Nb ᵐPib ev je'Yi `ēY ti'Z 20 ᵐgibU A'c'v KiZeb  20 ᵐgibU ci Dfq UKiv c_Kfvte IRb KiZeb  Gici ⚡k'YK GB `U Avj i UKivq IR'bi cv_K' tKb n'jv Zv e'vL'v KiZeb - Km 'i' i Av'M ⚡k'YK ⚡k'v_x'`i m'vqZv ⚡b'q U'ei GKU M'Q tK c'j'v_b e'vM ⚡'q tX'K ᵐKQ'Y ti'v'` ti'Z Kvfm ⚡b'q Avm'eb ⚡k'YK c'j'v_b e'vM Rjxq ev'ú tKb R'g'Q Zvi KvIY ⚡k'v_x'`i KvQ Rvb'Z PvB'eb  ⚡k'v_xiv DĒ' i ᵐ'j Zvi Av'jv'K Dᵐᵐ' n'Z Rjxq ev'ú AvKv' i cwb tēi nevi KvIY e'vL'v K'i c'`b m'Ü aviYv c`vb KiZeb </li> <li>⚡k'v_xiv `jxqfvte Av'jv'Pbv K'i crite#k c'`bi cfve m'ú'K GKU c'Zē'`b ^Zi K'i Dc'vcb KiZeb ⚡k'v_xiv Z'Z/ bxj Gi cwb'Z GKU t'c'c'iwggv Dᵐᵐ' i gj W'ēq ivLte Ges Gi c'ieZb chēy'Y K'i Zv LvZvq ᵐjLte D³ chēy'Yi ᵐf'Ē'Z ⚡k'YK Dᵐᵐ' i cwb tKvIY m'ú'K aviYv c`vb KiZeb	- tK'Yi I e'enwiK Kv'ri ⚡b'`kK e'envi K'i gj'vqb KiZeb </li> <li>ewoi Kv'ri ⚡b'`kK e'envi K'i gj'vqb KiZeb Aa'vqi tK'Y Afx'v mRbk'j ck cx'Z'Z Ab'ôZ nē

PZ_ Aa`vq : D<sup>TM</sup>†` eske^x

(10 ^wc^wi^wq^w)

^w kLbdj	^w elqe	^w kLb †kLv†bv †b†`kbv	gj`vqb †b†`kbv
e^wxeE^xq 1. †hšb Ges A†hšb cRb†bi g†a` c<sub>v</sub>_K` Ki†Z cvi†e 2. c^wivMvqb e`vL`v Ki†Z cvi†e 3. †e^wfb cKvi c^wivMvq†bi g†a` c<sub>v</sub>_K` Ki†Z cvi†e	- DTM†`i cRbb               <ul style="list-style-type: none"> <li>A†hšb</li> <li>†hšb cRbb</li> </ul> </li> <li>c<sup>w</sup>ivMvqb               <ul style="list-style-type: none"> <li>cKvi†f` - c^wivMvq	†k^wYK †k^wYK†y c_v_i K^wP c_vZv, †Mvj Avj, Av`v, †g<sup>w</sup>ó Avj, c<sub>v</sub>Zv evn†i i Wvj, Rev/bqbZviv dj †b†q †k<sup>w</sup>Yv_x†`i †`L†q †RÁ<sup>w</sup>mv Ki†e G,†jvi †Kfv†e eske<sup>x</sup>/bZb D<sup>TM</sup>†`i m^wó nq ? †k^wYv_xiv Zv†`i A<sup>w</sup>fÁZv eYbv Ki†j †k<sup>w</sup>YK †PÎ G†K †hšb I A†hšb cRbb m<sup>w</sup>ó†K eYbv Ki†eb </li> <li>†k<sup>w</sup>Yv_xiv †k<sup>w</sup>Y†Z c<sub>v</sub>_i K<sup>w</sup>P c<sub>v</sub>Zv, †Mvj Avj, Av`v, †g^wó Avj, c_vZv evn†i i Wvj, Rev/bqbZviv dj BZ`v`i †KvbU †K ai†bi cRbb nq Zv LvZvq †jL†e Ges †KQ †k^wYv_x †ev†W Zv Dc`vcbv Ki†e  †k<sup>w</sup>YK †dWe`vK †`†eb </li> <li>†k<sup>w</sup>Yv_xiv Zvi P<sup>w</sup>icv†ki †KQ D<sup>TM</sup>†` m^wMn Ki†e Ges Zv†`i †Kvb ai†bi cRbb nq Zv LvZvq †jL†e †g†a` Zj^wbv Ki†e Ges †k^wY†Z Dc`vcbv †k†l †k<sup>w</sup>YK †dWe`vK †`†eb </li> <li>e<sup>w</sup>oi K<sup>w</sup>R †n†m†e †k<sup>w</sup>Yv_x Zvi P<sup>w</sup>icv†ki A†hšb I †hšb cRbb nq Ggb D<sup>TM</sup>†`,†jv Avjv`v K†i Zv†`i bvg †jL†e Ges †Kvb Ask †_†K bZb DTM†`i m<sup>w</sup>ó nq Zv LvZvq †jL†e, †k<sup>w</sup>Y†Z Dc`vcbv Ki†e †k^wYK †dWe`vK †`†eb †k^wYK †k^wYv_x†`i †RÁ<sup>w</sup>mv Ki†eb †gsg<sup>w</sup>Q d†j N†i, ga m<sup>w</sup>Mn Q<sup>w</sup>ov Avi †K K†i? †k<sup>w</sup>Yv_xiv DĒi †`†j †Z^wb †e^wfb ai†bi c^wivMvq†bi †PÎ m^wajZ P^wU †`Lv†eb Ges m<sup>w</sup>ayZ eYbv Ki†eb </li> <li>†k<sup>w</sup>Yv_x LvZvq †e<sup>w</sup>fb cKvi c<sup>w</sup>ivMvq†bi bvg I m<sup>w</sup>Áv †jL†e Ges `jxq Av†jvPbv †k†l c^wivMvq†bi †e^wfb gva`g,†jvi bvg †ev†W †jL†e  Dc`vcbv †k†l †k^wYK †dWe`vK †`†eb †k^wYv_xiv e^woi K^wR †n†m†e †e^wfb cKvi c^wivMvqb †Kfv†e N†U Zvi †P^wýZ †PÎ AvK†e Ges bvg †jL†e, gva`g mn †e<sup>w</sup>fb cKvi c<sup>w</sup>ivMvq†Yi †Kškj Dc`vcbv †k†l †k^wYK †dWe`vK †`†eb †k^wYv_xiv GKK/`jxq fv†e `B ai†bi c^wivMvq†bi `e<sup>w</sup>kó,†jv Dc`vcbv K†i Zv†`i g†a` c_v_K`,†jv †jL†e Ges GKB m<sup>w</sup>v†_ D<sup>TM</sup>†`i R^we†bi c^wivMvq†bi ,i†Z Dc j^wx K†i Zv †ev†W †jL†e †k^wYv_xi K^wR †k†l †k^wYK †dWe`vK †`†eb †k^wYv_xiv c^wi†e†k (†j^wi P^wicv†k) N^wz †e^wfb ai†Yi c^wivMvqb †P^wýZ K†i DTM†`i bvgmn LvZvq †jL†e Ges Dc`vcbv Ki†e †k^wYK GK^wU dj †`L†q †k<sup>w</sup>Yv_x†`i d†ji †Kvb †Kvb Ask `eK I †Kvb	†k<sup>w</sup>Yi I e`en^wiK K^wv†Ri †b†`kK e`envi K†i gj`vqb Ki†eb - e<sup>w</sup>oi K<sup>w</sup>v†Ri †b†`kK e`envi K†i gj`vqb Ki†eb

^w kLbdj	^w elqe	^w kLb- ^t kLv ^b v ^w b ^t `kbv	gj`vqb <sup>w</sup> b <sup>t</sup> `kbv
4. ^wb^ll³KiY c^wμqv e`vL`v Ki^tZ cvi^te	• ^wb^tIK • dj • exR ^Z^wii aviYv	• ^tKvb Ask cs⁻eK Z^v Rvb^tZ PvB^teb ^wk^yv[_]x^t`i D<sup>E</sup>i cvIqvi ci <sup>w</sup>b<sup>t</sup>IK m<sup>+</sup>U<sup>+</sup> aviYv c`vb Ki^teb • d^tj i ^tKvb Ask d^tj c^wiYZ nq Ges ^wKfv^te nq ^tm m⁺U⁺K Z^v`i A<sup>w</sup>f<sup>+</sup>ÁZ<sup>v</sup> eYbv Ki<sup>t</sup>Z ej<sup>t</sup>eb  <sup>w</sup>k<sup>y</sup>v<sup>_</sup>xiv Z<sup>v</sup>`i A^wf⁺ÁZ^v eYbv Ki^tj ^wk^yK ^wb^tl^tKi ci dj l exR ^Z^wi m⁺U⁺K ^wP⁺Îmn m⁺s⁺y⁺ß eYbv Ki^teb • ^wk^yv[_]xiv `tj <sup>w</sup>ef<sup>3</sup> n<sup>t</sup>q GK`j dj nv^tZ ^wb^tq d^tj i ^tKvb Ask^wU d^tj c^wiYZ nq Z^v kbv³ K^ti LvZvq ^wP⁺Î AvK^te l bvg ^wjL^te Ab` `j ^wKfv^te exR ^Z^wi nq l DTM Rxe^tbi Gi[_] i⁺zZ ^wjL^te • e^woi KvR ^wnt⁺m⁺t⁺e ^wk^yv[_]xiv d^jmsMn K^ti ^wb^tl^tK Ask MnYK^vix Ask[_] t^jvi ^wP⁺Î LvZvq AvK^te Ges ^wKfv^te N⁺U Z^v ^wjL^te e^woi KvR ^tk^wY^tZ Dc⁻vcbv ^tk^tl ^wk^yK ^wdWe⁻vK ^w`t<sup>+</sup>eb </li> <li>• <sup>w</sup>k<sup>y</sup>K <sup>w</sup>KQ <sup>t</sup>iK<sup>v</sup>bv exR <sup>w</sup>b<sup>t</sup>q <sup>w</sup>k<sup>y</sup>v<sup>_</sup>x<sup>t</sup>`i ^t`<sup>w</sup>L<sup>t</sup>q <sup>w</sup>RÁ<sup>w</sup>mv Ki<sup>t</sup>eb G<sup>_</sup> t<sup>j</sup>v <sup>t</sup>_t<sup>+</sup>K <sup>w</sup>Kfv<sup>t</sup>e bZb PvivM<sup>v</sup>Q Drcb n<sup>t</sup>e  <sup>w</sup>k<sup>y</sup>v<sup>_</sup>xiv Z<sup>v</sup>`i A^wf⁺ÁZ^v eYbv Ki^tj ^wk^yK ^wP⁺Î G^tK Ask^tiv`Mg c<sup>w</sup>μqv eiS<sup>t</sup>q <sup>w</sup>`t⁺eb • ^wk^yv[_]xiv LvZvq A^yz^tivM^tgi c^fveK[_] t^jvi bvg ^wjL^te Ges Dc⁻vcbv Ki^te cix^yvgjK KvR • ^wk^yt⁺Ki AvKv ^wP⁺Î AbmⁱY K^ti ^wk^yv[_]xiv `jMZFv<sup>t</sup>e Ask<sup>t</sup>iv`M^tg Av^tjv, c^wib, eiqi c^tqvRbxqZvi cix^y^wU Ki^te Ges ch^te^yY LvZvq ^wjL^te ^tk^wY^tZ Dc⁻vcbv ^tk^tl ^wk^yK ^wdWe⁻vK ^w`t<sup>+</sup>eb	• e`en^wiK Kv^tRi ^wb^t`kK e`envi K^ti gj`vqb Ki<sup>t</sup>eb • Aa`v^tqi ^tk^wY Af^xy^v mRbk^j ck c^x^wZ^tZ Ab^wôZ n^te
5. cix^yvi gva^tg A^yz^tiv`Mg c`kb Ki^tZ cvi^te			

cÂg Aa`vq : mgšq Ges wbtmiY

(12 wciqW)

wKLbdj	welqe	wKLb tkLv#bv wb`kbv	gj`vqb wb`kbv
eixEšq 1. DTM I gvb#li tÿtÎ mgšq (Coordination) e`vL`v Ki#Z cvi#e 2. cevn wP#Îi mrvn#h` vqZ#ši Kv#ug e`vL`v Ki#Z cvi#e </p> <p>3. D<sup>TM</sup> Ges gvb#li Dİxcbv#jK wμqv (Reflex Action) D`vniYmn e`vL`v Ki#Z cvi#e 4. DTM I cvYxi eR` wbtmiY e`vL`v Ki#Z cvi#e	- D<sup>TM</sup> mgšq - gvb#li mgšq - cevnwP#Î vqZ#ši Kv#ug - D<sup>TM</sup> I gvb#li- - o Abf#Z MnY - o Hw`QK wμqv</li> <li>o A%b#w`QK wμqv - wbtmiY - o D<sup>TM</sup> - o gvb#li	- D<sup>TM</sup> Ges gvb#li mgšq c#Z m#u#K eYbv Ki#eb - wkÿv_x#`i Kv#Q dUej tLjvq GKRB tMvj iÿ#Ki A#fÁZv Rvb#Z PvB#eb  wecy`#ji tL#jvqvo hLb tMvj Kivi Rb` wKK tbq ZLb tMvj wKcv#i tPvL, nvZ cv kixi meB ej m#ve` thw`#K Avm#Z cv#i tmw`#K hvq tKb, Rvb#Z PvB#eb Gici vqi KvR m#u#K aviYv w`#eb </li> <li>PvU Gi wPÎ t`wL#q vq#Kv#li Mvb I Gi KvR eYbv Ki#eb wkÿv_x#`i wPÎ AvK#Z wb`kbv w`#eb </li> <li>wkÿv_xiv wkÿ#Ki t`lqv PvUwPÎ t`#L vq#Kv#li wPÎ AsKb Ki#e </li> <li>wkÿv_xiv vqZ#ši Kv#ug#i GKwU cevn wPÎ A#b Ki#e </li> <li>tKvb DËß wRv#m nvZ w`#j ev aviv#jv Qwi#Z nvZ co#j Kx c#Zwμqv nq Zv wkÿv_x#`i Kv#Q Rvb#Z PvB#eb  wkÿv_x#`i DËi cvlqvi ci Hw`QK/cwZeZx wμqv m#u#Ü aviYv w`#eb - Avqv#i ü`wC#Đi w`b ev km ckvm MnY I Z`v#Mi mgq dmd#mi DVvbgvi D`vniY w`#q A%b#w`QK wμqv e`vL`v Ki#eb	- tkiYi Kv#Ri wb`kK e`envi K#i gj`vqb Ki#eb </li> <li>ewoi Kv#Ri wb`kK e`envi K#i gj`vqb Ki#eb Aa`v#qi tkiY Af#ÿv mRbk#j ck c#Z#Z AbwôZ n#e

lô Aa`vq : cigvYi MVb

(13 wciqW)

wKLbdj	welqe	wKLb tkLv#bv wb#`kbv	gj`vqb wb#`kbv
eixEExq 1. cigvYi MVb e`vL`v Ki#Z cvi#e 2. cvigvYieK msL`v I fi msL`v e`vL`v Ki#Z cvi#e 3. AvB#mvUc e`vL`v Ki#Z cvi#e 4. AvB#mvU#ci e`envi eYbv Ki#Z cvi#e </p> <p>5. B#j#b web`vm e`vL`v Ki#Z cvi#e 6. Avqb Kxfv#e m#ó nq e`vL`v Ki#Z cvi#e 7. K`vUvqb Ges A`vbvqb Gi cv_K` Ki#Z cvi#e </p> <p>8. A`vbvqb Ges K`vUvqb e`envi K#i i#mvqibK ms#KZ cYqb Ki#Z cvi#e Av#eMxq 9. Avgv#`i Rxe#b AvB#mvU#ci Ae`vb Dc jwä Ki#e	- iv`vi#dW I tev#ii cigvYi MVb</li> <li>cvigvYieK msL`v - fi msL`v</li> <li>AvB#mvUc</li> <li>AvB#mvU#ci e`envi - K#I - v`</li> </ul> </li> <li>B#j#b web`vm (wciqWK tUie#j i c_g 18u tg#j i B#j#b web`vm)</li> <li>Avqb               <ul style="list-style-type: none"> <li>K`vUvqb - A`vbvqb</li> </ul> </li> <li>A`vbvqb Ges K`vUvqb e`envi K#i i#mvqibK ms#KZ	- cigvYi MV#bi aviYv w`#q iv`vi#dW I tev#ii cigvYi MVb e`vL`v Ki#e - chvq mvi#Yi m#v#h` wkyK wkyv_x#`i MVbPÎ A#b K#i PvR I Av#c#YK fi wjL#Z ej#e - cvigvYieK msL`v I fimsL`v wjLvi wbgg tkLv#eb wkyv_x tkwYK#y`jMZfv#e cvigvYieK msL`v I fi msL`v wjL#e </li> <li>wkyv_x`jMZfv#e wbevPZ tg#j i cZxK, cvigvYieK msL`v I fi msL`v, tcvUb, B#j#b I wbdU#bi msL`v P#U Dc`vcb Ki#e - AvB#mvU#ci aviYv w`#e  AR#v cZxK e`envi K#i P#Ui m#v#h` B#j#b, c#Uvb I wbdU#bi msL`v D#jL Ki#e - wP#Îi m#v#h` K#I, v`m# wewfb t#y#Î AvB#mvU#ci e`envi e`vL`v Ki#e </li> <li>K#I I v`#i wewfb t#y#Î AvB#mvU#ci Ae`vb wel#q GK#U ewoi K#R m#úb Ki#e </li> <li>wkyv_x wciqWK tUie#j i c_g 18u tg#j i B#j#b web`vm Ki#e - Avqb Gi aviYv e`vL`v Ki#e KLb K`vUvqb Ges A`vbvqb m#ó nq e`vL`v Ki#e `jMZ Kv#R wkyv_x wP#Îi m#v#h` wbevPZ tg#j i B#j#b MnY ev eR#bi gra#g AvqibZ nq e`vL`v Ki#e - K`vUvqb I A`vbvqb n#Z th#Mi g#Wj ^Zwi Ki#e - avZ K`vUvqb I AavZ A`vbvqb MV#bi gra#g AvqibK th#MMVb n#e MnY I eRbKZ B#j#b msL`vi wf#E#Z wKfv#e thvRbx w#aviY nq e`vL`v Ki#e	tk#Yi Kv#Ri wb#`kK e`envi K#i gj`vqb Ki#e </li> <li>e`envi K Kv#Ri wb#`kK e`envi K#i gj`vqb Ki#e </li> <li><b>Aa`v#qi tk#Y Af#y#v mRbKxj ck cx#Z#Z Ab#ôZ n#e

mḥg Aa'vq : cṽ_ex l gnvKI

(10 ṽciqW)

ṽKLbdj	ṽelqe	ṽKLb ṽkLvṽb ṽb'ṽkb	gj'ṽqb ṽb'ṽkb
eṽxeḂq 1. gnvKI eṽL'ṽ KiṽZ cviṽe 2. gnvKI Ges AṽfKṽli cṽ_K' eṽL'ṽ KiṽZ cviṽe 3. AṽfKIR ZiY eṽL'ṽ KiṽZ cviṽe 4. fi l IRṽbi cṽ_K' KiṽZ cviṽe 5. AṽfKIR ZiṽYi cṽṽe e'ṽi IRṽbi cṽieZb ṽeṽkIY KiṽZ cviṽe AvṽeMṽq 6. Avṽṽ'ṽ i Rṽeṽb AṽfKIR ZiṽYi Ae'ṽb Dcṽjṽä Kiṽe	• gnvKI • AṽfKI • gnvKIṽq ej • AṽfKIR ZiY • fi l IRb • cṽ_exi ṽeṽfb ṽṽṽb AṽfKIR ZiY l e'ṽi IRb	• Dcṽii ṽ'ṽK Qoṽj mKj e'ṽB ṽbṽPi ṽ'ṽK cṽZZ nq • MṽṽQi dj gṽUṽZ cṽo ṽKb? • ṽkṽṽ_x ṽ'ṽxqṽṽe cṽki DḂi LRṽe ṽkṽK AvṽjṽPbvq ṽdWe'ṽK ṽ'ṽeb • cṽ_ex mṽhi Pṽiṽ'ṽK Nṽi ṽKb eṽL'ṽ Kiṽe Ges ṽkṽK ṽdWe'ṽK ṽ'ṽeb • cṽkṽḂṽii gṽṽṽṽ ṽkṽK AṽfKI l gnvKI eṽji avṽYṽ ṽ'ṽeb • Zṽ'ṽi ga'eZṽ ṽiZ cṽieZb nṽj AvKIY eṽji Kṽ cṽieZb nq ṽkṽK eṽL'ṽ Kiṽeb • ṽkṽṽ_x BU,cṽ_i eṽ ṽPqṽi Dcṽi DVṽZ Kṽ AṽfÁZṽ nq ṽjMZṽṽe ṽkṽYṽZ mṽúb Kiṽe • ṽKṽb e'ṽK Dcṽi DVṽZ ṽh eṽji cṽqṽRb nq c'ṽkb Kiṽe • ṽkṽK AṽfKIR ZiY eṽL'ṽ Kiṽeb • ṽkṽṽ_x e'ṽi fi l IRb ejṽZ Kṽ eSṽq Zṽ eṽL'ṽ Kiṽe Ges ṽkṽK ṽdWe'ṽK ṽ'ṽeb • Ôe'ṽ fi Kṽ ṽeṽfb ṽṽṽb ṽeṽfb nṽZ cṽṽiÔ ṽkṽṽ_xṽK DḂi ṽLvRṽi Rṽ' ejṽeb • ṽkṽK AvṽjṽPbvq ṽdWe'ṽK ṽ'ṽeb • ṽkṽK D'ṽniY ṽ'ṽq AṽfKIR ZiṽYi cṽṽe e'ṽi IRṽbi cṽieZb eṽL'ṽ Kiṽeb • ÔAṽfKIR ZiṽYi cṽṽe e'ṽi IRṽbi cṽieZbÔ ṽelṽq cṽxṽY c'ṽkb Kiṽe	• ṽkṽYi KṽṽRi ṽb'ṽkK e'ṽenvi Kṽi gj'ṽqb Kiṽeb • eṽoi KṽṽRi ṽb'ṽkK e'ṽenvi Kṽi gj'ṽqb Kiṽeb • Aa'ṽqi ṽkṽY Aṽxṽṽ mRbṽj ck cṽiZṽ AbṽôZ nṽe

Αόγ Αα'νq : iνmνqιbK ιeιμqν

(8 ιcιiQW)

ιKLbdj	ιeIQe	ιKLb ιKLνιbν ιbι`kbν	gj`vqb ιbι`kbν
ειxeEiq 1. ιeιfb cKvi iνmνqιiK ιeιμqν e`vL`v KiιZ cviιe	- iνmνqιbK ιeιμqν - msιhvRb `nb</li> <li>cιZ`vcb - ckgb - ιeιhvRb	- ιkÿv_x iνmνqιbK cιeZιbi aviYv nιZ iνmνqιbK ιeιμqν mαúιK AιfĀZv eYbv Kiιe - ιkÿK D`vniY ι`ιq ιeιfb cKvi i iνmνqιbK ιeιμqν e`vL`v Kiιeb - ιkÿv_x ιkÿιKi mνιhιMZvq Kx cιeZb NιU c`kb Kiιe-                             <ul style="list-style-type: none"> <li>mνj dvi,g`vMιbιmqv ι Gjιgιbqvq eιZvιm ιcvoιιj - ιgvq Rvιιιj Ges M`vιmι Pιvq M`vιmι c%ιjb - Pιb Kιeb-WιB-A·vBW - Pιv cι_ι,Kcvi KveιbU, Gιgιbqvq ιKvιvBW Ges cUιkqvq ιKvιiUιK c_K c_K fιιe Zvc ι`ιj</li> <li>ιeιfb avZι mνι_ ZιZι `eY - Pb ι Pιbi cιbι mνι_ c_K c_K fιιe ιfιbMvi/ ιjei im	- e`envi iK KvιRi ιbι`kK e`envi Kιi gj`vqb Kiιeb - ιkιYi KvιRi ιbι`kK e`envi Kιi gj`vqb Kiιeb </li> <li>eιoi KvιRi ιbι`kK e`envi Kιi gj`vqb Kiιeb Aa`vιqi ιkιY Afιÿv mRbιj ck cxιZιZ AbιôZ nιe
2. iνmνqιbK ιeιμqνi gva`ιg ιeιfb cKvi i kι³ i iιcιši e`vL`v KiιZ cviιe	- iνmνqιbK ιeιμqν kι³ i iιcιši - Zvc kι³ - AvιjvK kι³	- Dcιiv³ iνmνqιbK ιeιKqv kι³ i iιcιši Kxfιιe NιU ιkÿv_x e`vL`v Kiιe ιkÿK AvιjvPbvq ιdWe`vK ι`ιeb - Lιvi ιmWvq ιjei im eν ιfιbMvi ιgkιιj Kx NUιe e`vL`v Kiιe	
3. ιι@ ιKvιιi kι³ i iιcιši e`vL`v KiιZ cviιe	ιι@ ιKvι	GKιU ιι@ ιKvιιK ι`ιq Zιor eZbι `Zιi Kιi GιZ kι³ i iιcιši e`vL`v Kiιe	
4. Zιor ιeιkιY e`vL`v KiιZ cviιe	Zιor ιeιkιY	Zιor ιeιkιY e`vL`v Kiιe	
gιbιcιkR 5. cιxÿY KvιR iνmνqιiK c`v_ Ges Ab`vι` h`cιιZι e`envi mιVKfιιe KiιZ cviιe		ôAvγvι`i Rxeιb iνmνqιbK ιeιμqνi Ae`vιô ιeιιq GKιU eιoi KvιR mαúιb Kiιe	
AvιeMιq 6. Avγvι`i Rxeιb iνmνqιbK ιeιμqνi Ae`vι Dcιjιä Kiιe			

beg Aa`vq : eZbx Ges Pje`r (9 wciqW)

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv
eixE`xq</b></p> <p>1. Gwm Ges wwm cevni aviYv e`vL`v KiZ cvite </p> <p>2. Zlor eZbxZ tiva, wDDR Ges Pwe c`qvRbxqZv e`vL`v KiZ cvite 3. Zlor cevn Ges wefe cv_K`i ga`Kvi maúK t`jLwP`i mwnvth` e`vL`v KiZ cvite </p> <p>4. tkY I mgvŠivj eZbxZ Zlor cevn Ges wefe cv_K`i wfbZv c`kb KiZ cvite </p> <p><b>gbv`c`kR</b></p> <p>5. Zlor cevn Ges wefe cv_K`i cigv`c A`wgUvi I t`fvëwgUv`i mVK e`envi KiZ cvite </p> <p><b>AvteMxq</b></p> <p>6. we`Zi Kvhi e`envi Ges AcPq tivta w`bR m`PZb nte Ges Ab`i m`PZb KiZ cvite	- Gwm Ges wwm cevn - tiva, wDDR, Pwe - Zlor cevn I wefe cv_K`i Ges Intgi mI</li> <li>tkY Ges mgvŠivj eZbx</li> <li>A`wgUvi I t`fvëwgUv`i KvR Ges eZbxZ G`i e`envi	- Zlor cevn B`j`bi cevn Zvi GKU Zjbv wkYK UvbZ cvib , - bj w`tq cwb cevn c`kb K`i   DPZ ivLv GKU cwbi cvI t`K GKU b`ji t`fZi w`tq cwb Kxfvte w`bPi cvI cevnZ nq Zv e`vL`v KiZ cvib - cwbi cevn w`bi Ki`e wU cvI`i g`a` D`PZvi cv_K`i Ici Ges b`ji ck`Zvi Ici </li> <li>GKU wKc w`tq ievi b`jK t`p`c ai`j cwb cevn eÜ nte G t`y`I wKcU `e`wZK P`ci Abi`c Ges bjwUi c`q`Q` I `N` w`bq eZbx Zv`i Abi`c - cwbi cvI `wUi Ae`vb chv`tg DP w`bP Kiv nq, cwbi cevn w`K e`j Ki`e  GU Gwm Zlor cevni mv`_ Zjbq wkY`_x cieZxZ GU c`kb Ki`e </li> <li>Zlor eZbx me, t`jv c`qvRbxq Dcv`vb e`vUwi, cwievnx Zvi, Pwe t`fvë wgUvi, A`wgUvi wkY`_x`i mieivn Kiv nte hv w`bq Zviv eZbx `Zvi Ki`e Ges c`kb Ki`e - tiva cwieZb K`i Ges GKei wU tivaZ mgvŠivj Ges wwiR m`thvM K`i Zlor cevni w`bq, t`jv cixYv Ki`e - Zlor cevn e`envi K`i weifb KvR thgb ewZ Rvjv`bv, cvLv Niv`bv, Zvc Drcv`b BZ`w` e`vL`v Ki`e - we`Zi Kvhi e`envi Ges AcPq tivta Kxfvte w`bR m`PZb nte Ges Ab`i m`PZb Ki`e0 weI`q KvRU ewoZ maúb Ki`e	- tkYi KvRi w`b`kK e`envi K`i gj`vqb Ki`eb - ewoi KvRi w`b`kK e`envi K`i gj`vqb Ki`eb - GB Aa`vq t`kI mRbxj ck c`wZ`Z GKU tkY Afxyv Abi`Z nte

GKv`k Aa`vq : Av`jv (10 wciqW)

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv
ewxeE`xq</b></p> <p>1. ^`b`b Rxe`b msNwVZ ciZmi`Yi NUbv,`jv wPÎ A`b K`i e`vL`v Ki`Z cvi`e 2. cYAf`šixY ciZdj b e`vL`v Ki`Z cvi`e </p> <p>3. AcwUK`vj dıBeri i Kır e`vL`v Ki`Z cvi`e 4. g`vM`b dıBıqs Mv`mi Kır e`vL`v Ki`Z cvi`e </p> <p>5. Pkgvi Kır e`vL`v Ki`Z cvi`e </p> <p>6. K`v`gıv Ges tPvLi Kv`mug Zjbv Ki`Z cvi`e Av`teM`xq 7. Avgv`i ^`b`b Rxe`bi wewfb Kv`m`tg Av`jvi Ae`vb Dcjv`ä Ki`Z cvi`e	• ciZmiY • ciZmi`Yi NUbv`j (Rbıcq 4wU NUbv) • cYAf`šixY ciZdj b</li> <li>• AcwUK`vj dıBeri • g`vM`b dıBs Mm • Pkgvi Kır • tPvL I K`v`gıv	• Av`jvK i`k GK`Q gva`g t`K Ab`Q gva`g wZhK fıte Av`vZ`bi t`y`Î wky`v_x`i Pricı`ki Af`ÁZv eYbv Ki`Z ej`eb  gva`g ci`ieZ`b Av`jvi m`Ávj`b MwZc`i wfbZv I Av`jvi ciZmiY m`ú`K avıYv m`ú`ó Ki`eb • wky`v_x GKwU Kv`Pi Mv`m ev wKv`i Af`aKUv cwb w`bq ZıZ GKwU tci`Yj ev KwV KıZ K`i ivL`j Kx N`U Zv c`kb Ki`e • cwb e`ZxZ Ab` tKvb Zi`j tci`YjwU tWew`j Kx NU`te wky`v_x ch`e`yY Ki`e Ges e`vL`v Ki`e </li> <li>• Av`jvKi`k Nb gva`g t`K nvjKv gva`g A`ev nvjKv gva`g t`K Nb gva`g hvevı mgq tKvb w`K t`e`K hvq tKb wR`Ám Ki`eb Ges e`vL`v Ki`eb • cwbcy Kv`Pi Mv`m GKwU avZe g`v tdj`j Kx N`U wky`v_x Zv c`kb Ki`e Ges Av`jvK i`k i`i wPÎ A`b Ki`e </li> <li>• wky`K Nb gva`g t`K Av`jvK i`k nvjKv gva`g hvevı mgq Av`vZb tKv`Yi gıv m`gMZ eıv`Z_vK`j ciZmiZ i`k Kx fıte t`e`K hvq Zv wPÎmn e`vL`v Ki`eb • G aı`bi Av`jvKxq NUbı Af`ÁZv eYbv Ki`Z ej`eb  wky`K Av`jvPbvq AskMvY Ki`eb Ges G NUbıB Kx fıte cYAf`šixY ciZdj b e`vL`v Ki`eb • gıbe Kj`v`Y cYAf`šixY ciZdj`bi e`envı m`ú`K wky`v_x`i avıYv w`eb • wky`v_x g`vMıbdıBs Mm w`tg mhi`k`K GKw`Z tdjv c`kb Ki`e • Pkgvi Kır m`ú`K wky`v_x Af`ÁZv eYbv Ki`e </li> <li>• wky`K GB Av`jvKxq NUbv e`vL`v Ki`eb Ges Pkgvq e`eüZ wewfb iKg t`jY m`ú`K Zı`i avıYv w`eb • wP`Îi gva`g K`v`gıv I tPvLi Af`šixY Mv`b eYbv Ki`eb </li> <li>• K`v`gıv I tPvLi Kv`mug e`vL`v Ki`eb </li> <li>• ŐAvgv`i Rxe`bi wewfb Kır Av`jvi Ae`vb Őel`q GKwU Kır ewıvZ m`ú`b Ki`e	• tkwYi Kv`Ri wb`kK e`envı K`i KırwU gj`vqb Ki`eb • Aa`v`qi tkwY AfıYv mRbkj ck cxıZ`Z AbıvZ n`e

Øv`k Aa`vq : gnvKvk I DcMn

(11 wciqW)

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv
ewxexq 1. gnvKvk Ges gnwek e`vL`v KiZ cvi`e </p> <p>2. cvKvZK Ges KvÎg DcMn e`vL`v KiZ cvi`e 3. DcMni Kÿc`_i Pjvi MvZ e`vL`v KiZ cvi`e 4. KvÎg DcMni e`envi I , iZ eYbv KiZ cvi`e Av`exq</b></p> <p>5. KvÎg DcMni Ae`vb Dcjwä KiZ cvi`e	• gnvKvk (Space) Ges gnwek (Universe) • DcMn (cvKvZK Ges KvÎg) • DcMni Kÿc`_Pjv</li> <li>• KvÎg DcMni e`envi I , iZ	• gnwek mwi aviYv e`vL`v KiZeb • gnwek KZ eo Ges Gi gta` Kx Kx e` AvQ eYbv KiZeb • wkÿv_x gnwe`ki ga`Z e`mg`ni GKvU Zwj Kv tkvY`Z m`ub Ki`e </li> <li>• gnvKv`ki we`Zi aviYv eYbv KiZeb </li> <li>• gnvKv`ki we`Z m`u`K GKvU KvR tkvY`Z m`ub Ki`e • KvÎg DcMn Kxfv`e`vcb Kiv nq Zvi BiZnm Rvb`eb </li> <li>• Pv` th cv_exi DcMn Zv e`vL`v KiZeb Ab` A`bK M`ni th DcMn AvQ Zv Rvb`eb • GKvU cv_i`K `wo`Z teta Zv th e`vKvi c`_Ptj GB `ovš w`tq DcMni Kÿc`_Pjv e`vL`v KiZeb • ØKvÎg DcMni Kxfv`e Kÿc`_v`KØ wel`q GKvU ewoi KvR m`ub Ki`e • Z` thvMv`hv`M KvÎg DcMni e`envi Ges , iZ eYbv KiZeb • Øgvbe mf`Zvi AMhvÎvq Ges gnvKv`K Rvbi tÿ`Î KvÎg DcMni Ae`vbØ wel`q iPbv cvZ`thvMZvi AvqvRb KiZeb	• tkvYi KvRi wb`kK e`envi K`i KvRvU gj`vqb KiZeb • ewo KvRi wb`kK e`envi K`i KvRvU gj`vqb KiZeb • Aa`tqi tkvY Afÿv mRbkj ck cxvZ`Z AbvØZ n`e

Îtqv`k Aa`vq : Lv`` I cıó (8 wciqW)

wkLbdj	welqe	wkLb tkLv#bv wb`kbv	gj`vqb wb`kbv
eıxeEıq 1. wıfb Lv#`i cıó,Y e`vLv Ki#Z cvi#e 2. cıóı AfveRıbZ tivM wbYq I cıZııvıai Dcvq eYbv Ki#Z cvi#e 3. Pwın`v Abhvqx Lv`` wbevPb Ki#Z cvi#e	- wıfb Lv#`i cıó,Y - cıóı AfveRıbZ tivM - IRb, D"PZv I eqm Abhvqx Lv`` wbevPb	- wkYK wıfb cKvi Lv`` tkıYKıY wb#q wM#q wkYv_x#`i#e ck K#i Lv#`i bvg, tkvb cKvi Lv`` Dcv`vb Ges tkvbıUi g#a` Kx Kx cıó,Y i#q#Q Zv hvPvB Ki#Z cv#ib - eıoi Kvr ŐGK#ejvi MnbKZ Lv#` cıó,Y Ő tkıY#Z Dc`vcb Ki#Z ej#Z cv#ib - Acıóı wKvi tkvb tk#j/tg#qi Qıe Kv#m c`kb K#i Kx Kx Kvi#Y Ggb nq Zv wkYv_xı wıbKU tk#K Rvb#Z cv#ib </li> <li>wkYv_x#`i aviYvi mv#_ cV`c`#Ki Á#bi msıgkY NıU#q Kx Kx cıóı Afv#e Kx Kx tivM nq Ges Zv cıZııvıai Dcvq wkYv_x#`i D`niYmn eıS#q ej#Z cv#ib - eıoi Kvr wımv#e tkvb cıóı Afv#e tkvb tivM nq Zv tUw#ji gva#g tcv÷v#i c`kb Ki#Z ej#Z cv#ib </li> <li>wkYv_x#`i#K kvıııK cııeZ#bi tkvb Ae`vq tkvb Lv`` teık tL#Z n#e tm,wji bvg tev#W wjL#Z ej#Z cv#ib </li> <li>wkYv_x#`i#K `jMZ Kvr wımv#e kvıııK cııeZ#bi mv#_ Lv#`i Pwın`vı cııeZ#bi KviY w#tkıY K#i tcv÷v#i Dc`vcb Ki#Z ej#Z cv#ib </li> <li>wkYK eqm, IRb, D"PZv I wj½ Abhvqx Lv`` wbevPb m#úKxZ w#wıZ Av#jvPbv Ki#Z cv#ib - wkYv_x#`i eıoi Kvr wımv#e cııev#ıı m`m`ıı eqm, IRb, D"PZv I wj½ Abhvqx Lv`` wbevP#bi PvU/cıZ#e`b ^Zıı Ki#Z w#Z cv#ib	- tkıYı Kı#Rıı wb#`kK e`envı K#i KvrıU gj`vqb Ki#eb </li> <li>eıo Kı#Rıı wb#`kK e`envı K#i KvrıU gj`vqb Ki#eb Aa`v#qi tkıY AfıYv mRbkıj ck c#ıZ#Z AbıŐZ n#e

PZ`k Aa`vq : cwi`tek Ges e`v`Zš (12 wciqW)

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv
e`xeE`xq 1. e`v`Zš i Dcv`vb I cKvi`f` e`vL`v Ki`Z cvi`te	• e`v`Zš • e`v`Zš i Dcv`vb               <ul style="list-style-type: none"> <li>o Ro</li> <li>o Rxe</li> </ul> </li> <li>• e`v`Zš i cKvi`f` - o jR - o RjR	• e`v`Zš i A_ wk`yK e`vL`v Ki`teb e`v`Zš i Dcv`vb e`vL`v Ki`teb • wk`y_v_x `jMZfv`te we`vj`q e`v`Zš i Dcv`vbmgN wPry`Z Ki`te • wk`yK e`v`Zš i cKvi`f` Av`jvPbv Ki`teb </li> <li>• wk`y_v_x we`vj`q/Zvi GjvKvq `jMZfv`te e`v`Zš i cKvi`f` wPry`Z Ki`te Ges Dcv`vb,`tjvi bvg wjL`te </li> <li>• Lv`k•Lj I Lv`Rvj e`vL`v Ki`teb • wk`y_v_xiv wP`ti m`v`v`h` Lv`k•Lj I Lv`Rvj ^Zwi Ki`te </li> <li>• e`v`Zš k`³ cevn e`vL`v Ki`teb  wk`y_v_x e`v`Zš i k`<sup>3</sup> i cevn wP`i e`vL`v Ki`te </li> <li>• cwi`te`ki fvimvg` i`y`vq e`v`Zš i fvgKv wk`yK eYbv Ki`teb • R`x`te e`v`Zš i Ae`vb D`jL GesGi mi`y`vq Ab`ti i m`PZb Ki`v`w`el`q GKwU ewoi KvR m`ub Ki`te	• tk`Yi Kv`Ri wb`kK e`envi K`ti              KvRwU gj`vqb Ki`teb </li> <li>• ewo Kv`Ri wb`kK              e`envi K`ti KvRwU              gj`vqb Ki`teb </li> <li>• Aa`v`qi tk`Y Af`y`v mRbk`j ck              cx`iZ`Z Ab`oZ n`te
2. Lv`k•Lj I Lv`Rvj e`vL`v Ki`Z cvi`te	• Lv`k•Lj</li> <li>• Lv`Rvj		
3. e`v`Zš k` <sup>3</sup> cevn e`vL`v Ki`Z cvi`te	• e`v`Zš k`³ cevn		
4. cwi`te`ki fvimvg` i`y`vq e`v`Zš i fvgKv we`tkiy Ki`Z cvi`te	• cwi`te`ki fvimvg` i`y`vq                e`v`Zš i fvgKv		
Av`teM`xq 5. R`x`te e`v`Zš i Ae`vb Dc`jw`ä Ki`te Ges Gi mi`y`vq Ab`ti i m`PZb Ki`Z cvi`te			

10. $k_{\text{v}} \mu g$ QK
beg - $\text{`kg} \dagger k_{\text{wY}}$

c_g Aa'vq : DbZZi Rxebaviv (17 wciqW)

wkLbdj	welqe	wkLb †kL#bv wb†`kbv	gj`vqb wb†`kbv	wetkl †jLK wb†`kbv
ewxexq 1. Lv`i Dcv`vb I Av`k Lv` wciwgW e`vL`v Ki†Z cvi†e 2. Lv` msi†Yi c†qvRbxZv eYbv Ki†Z cvi†e </p> <p>3. m`v` i†vq cvKwZK Lv` Ges dv÷ dW Gi cfve wetkIY Ki†Z cvi†e 4. wfUwgbi Drm Ges Gi AfveRibZ ciZwμqv e`vL`v Ki†Z cvi†e 5. Lwb†Ri Drm Ges Gi AfveRibZ ciZwμqv e`vL`v Ki†Z cvi†e 6. cwlb I Avkh³ Lve†ii DcKwiZv eYbv Ki†Z cvi†e	- Lv` <ul style="list-style-type: none"> <li>Dcv`vb - Av`k wciwgW</li> <li>msi†Y (Preservation)</li> </ul> </li> <li>mVK Lv` wbevPb : - cvKwZK Lv`</li> <li>dv÷ dW</li> </ul> </li> <li>wfUwgb (G,we,wm Ges B) : <ul style="list-style-type: none"> <li>Drm</li> <li>AfveRibZ ciZwμqv</li> </ul> </li> <li>LwbR (K`vjwμqv,Avqib Ges dmdimv): - Drm - AfveRibZ ciZwμqv - cwlb I Avkh³ Lve†i : - Drm - AfveRibZ ciZwμqv	GKK KvR : - wkŷv_xi MnYKZ 10U Lv`i bvg G†i Lv` Dcv`vb I KvR</li> </ul> </li> <li><b>`jMZ KvR : - Av`k Lv` wciwgW kZKiv nvmn êkó †Kvb Dcv`vb kZKiv KZ fVM_v†K</li> </ul> </li> <li>wkŷK cvKwZK Lv` I dv÷ d†Wi wPÎ mawjZ PvU †`Lv†eb </li> <li>GKK / `jMZ KvR PvU †`L wkŷv_xiv Lv`,†jv Avjv` I Gi cfve eYbv Ki†e </li> <li><b>GKK / `jMZ KvR wkŷv_xiv 10U wfUwgbh³ Lv`i bvg, Kx wfUwgb e`gvb AfveRibZ j†Y ewoi KvR : cvKwZK Lv` I dv÷ d†Wi DcKiY I †ZKi w`K,†jv eYbv GKK / `jMZ KvR</b> o K`vjwμqv, Avqib, dmdimmg× 2U K†i Lv`i bvg I Gi DcKwiZv </li> <li><b>GKK / `jMZ KvR o cwbi Af†e / cwlb íZvi Kv†Y Kx mgm`v n†e </li> <li>Avkh<sup>3</sup> 5U Lv`i bvg, AfveRibZ j†Y	mVK Lv` Dcv`vb wPŷZKiY Ges G†i KvR Dc`vcb</li> <li>Av`k Lv` wciwgW A†b – Lv` wciwgW – Dcv`vbi êkó – kZKiv nvi</li> <li>G I wm wfUwgbmg× 5U d†ji bvg I KvR</li> <li>wkŷv_xiv we I B wfUwgbi mnn†h` Lv` kbv<sup>3</sup> I G†i AfveRibZ j†Y</li> <li>Q†K – K`vjwμqv, Avqib I dmdimmg× Lv`i bvg – AfveRibZ j†Y – ciZKv†i Dcvq	

c_g Aa`vq : DbZZi R`ebariv

(17 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb t`kLb`bv w`b`kbv	gj`vqb w`b`kbv	wet`kl t`jLK w`b`kbv
7. eW gvm Bb`W · I gW gvm t`i`kD e`envi Ges c`qRbxqZv e`vL`v Ki`Z cvi`te	eW gvm Bb`W · (wGgAvB) I eW gvm t`i`kD (wGgAvi) Gi wnmve Ges G`i c`qRbxqZv	- eWgvm Bb`W · I Av`k gv`bi g`a` Zjbv w`bYq – c`qRbxqZv</li> <li><b>wk`y`Ki KvR</b> c`x`Z, t`jvi bvg I t`Kvb t`Kvb Lv` t`Kvb c`x`Z`Z msi`yY Kiv nq - wk`yK t`k`yK`y PvU t`Lv`eb (R`vg/t`R`j, gvQ, AvPvi, gvIP, Wvj, t`Qvjv) `jMZ / GKK KvR</b> Pv`Ui Dcv`vb, t`jv w`Kfv`te msi`yY Kiv nq Zv w`jL`te </li> <li><b>GKK / `jMZ KvR Lv`e` msi`y`y iwmvqibK c`v` e`env`ii mdj, AvZ`i<sup>3</sup> e`env`ii Kdj </li> <li><b>GKK / `jMZ KvR wk`y`x`iv K`qK`iU ZvgvK RvZxq Dcv`vb Ges 2wU WwMm Gi bvg, G`i`i`y`ZKi w`K </li> <li>c`kvE`ii gva`tg HIV Kxfv`te t`tni c`Z`iva`y`gZv b`o K`i Dc`vcb</li> <li><b>`jxq KvR kix`ii c`Z`iva e`e`vi Dci AIDS Gi cfve e`vL`v		Lv`e` msi`y`y iwmvqibK c`v` e`envi t`Kvb t`Kvb t`c`y`Z Abtgw`Z Ges KLB GiU Abtgw`Z bq e`vL`v Ki`Z n`te Ges G, t`jvi kvi`xiK c`Z`muqi w`e`Avb`f`i`E`K e`vL`v w`t`Z n`te </li> <li>mvgwRK m`PZbZv ^Z`ii Dcvq`vK`te  ZvgvK I gv`t`Ki kvi`xiK c`Z`muqi w`e`Avbm`q`Z e`vL`v w`t`Z n`te  ZvgvKi g`a` w`m`M`i`U, j, R`v, mv`v BZ`w`v` _vK`te  G w`el`q w`PvKrmK Ges I`temmvB`Ui mvrnh` tbqv th`Z c`i`i
8. Lv` msi`y`y iwmvqibK c`v` e`env`ii c`qRbxqZv e`vL`v Ki`Z cvi`te	Lv`e` msi`y`y iwmvqibK c`v` e`envi (the use of chemicals as preservative in food) I Gi kvi`xiK c`Z`muq			
9. Lv` AvZgw`vq iwmvqibK c`v` e`env`i kvi`xiK c`Z`muq w`et`kly Ki`Z cvi`te				
10. ZvgvK I gv`t`Ki kvi`xiK c`Z`muq e`vL`v Ki`Z cvi`te	ZvgvK I gv`K: kvi`xiK c`Z`muq			
11. gvb`li kix`ii c`Z`iva e`e`vi Dci GBW`mi cfve eYbv Ki`Z cvi`te	gvb`li kix`ii c`Z`iva e`e`v : GBWm			

c_g Aa`vq: DbZZi Rxebaviv

(17 wciqW)

Pjgvb-3

wkLbdj	welqe	wkLb tkLtbv wb`kbv	gj`vqb wb`kbv	wetkl tkLK wb`kbv
12. kvixwiK wdu#bm eRvq ivLvi tkKkj e`vL`v Ki#Z cvi#e AbmÜvb 13. ciiev#ii m`m`#`i mVK Lv` wbevPb I Rxebaviv (Life Style) AbmiY welqK AbmÜvb KvR Ki#Z cvi#e gbv#cikR 14. m` Rxebhvc#bi Rb` Lv` wbevPb, Rxebaviv cieZb Ges Lv` ivmvqibK c`v#_i e`envi wel#q m#PZbZv ^Zii wel#q tcvóvi A#b Ki#Z cvi#e Av#eMxq 15. DbZZi Rxebgvb eRvq ivLvi Rb` mVK mVK Lv` wbevPb I Rxebaviv (Life Style) PPvi Rb` mgv#R m#PZbZv m#ó Ki#Z cvi#e </p> <p>16. Lv` ivmvqibK c`v#_i e`envi m#ó#K m#PZbZv m#ó Ki#Z cvi#e	- kvixwiK wdu#bm: - Lv` Mn#Yi wbggbxZ ( ^`wbK evi, ciigvY, wPev#bv) - jZv Ges IRb wbgšY - kxYKvq - Wv#qUs - Ng - wekvg - Aemi - wetbv`b</li> <li>kixiPPv</li> <li>kvixwiK I gvbIK v`	GKK KvR - wkYv_xiv Zv#`i eqm, IRb I D`PZv LvZvq wjL#e - eWgvm Bb#W · I Av`k gv#bi g#a` cv_K`</li> </ul> </li> <li><b>GKK / `jMZ KvR - Avgiv w`#b KZevi, KLb, Kx ciigvb Lv` MnY Kwi Gi ZwjKv ^Zii - Llevi wPietq LvIqv D#Pr c#kvE#i i gva#g Dc`vcb</li> </ul> </li> <li><b>GKK / `jMZ KvR - j I kxYKvq wkYv_xiv `jxq fv#e Zv#`i mgm`v, #jv wjL#e, j I IRb wbgšY bv_vK#j mgm`v I wbgš#Yi Dcvq - B#Z : Wv#qUs, kixi PPv - Ng, wekvg, Aemi I wetbv`bi c#qvRbxqZv c#kvE#i i gva#g Dc`vcb		- kvixwiK wdu#bm eRvq ivLvi Rb` 10wU AvB#Ug t`Iqv ntq#Q m` Rxebhvc#bi Rb` G, #jvi tkb c#qvRb Zvi weÁvbm#Z e`vL`v Ges Kxfv#e Zv PPv Kiv n#e Zv eYbv Ki#Z n#e ^`wbK KZevi Lv` MnY Kiv c#qvRb, mKvj, `ciI iv#Zi Llevi Mn#Yi Dch<sup>3</sup> mgq, Lv` Mn#Yi mv#_ wekv#gi m#ó#Ki eYbv_vK#Z n#e - G wel#q cióie`, msi#ó wPikrmK Ges I#emmvB#Ui m#v#h` tbqv th#Z cv#i

W0Zxq Aa"vq : Rxe#bi Rb" cwb (18 wciqW)

wkLbdj	welqe	wkLb tKL#bv wb#`kbv	gj"vqb wb#`kbv	we#kl tJLK wb#`kbv
eixEExq 1. cwb ag eYbv KiZ cvite 2. cwb MVb e"vL"v KiZ cvite 3. cwb Drm e"vL"v KiZ cvite 4. RjR DTM I RjR cvYxi Rb" cwb c#qvRbxqZv Ges cwb gvb`Ê e"vL"v KiZ cvite 5. cwitek msiyY cwb cbt AveZb avcmg+n cwb figKv we#kIY KiZ cvite 6. gybma\$Z (Quality) cwb c#qvRbxqZv eYbv KiZ cvite 7. cwb weixKiY cμqv e"vL"v KiZ cvite	• cwb ag • cwb MVb • cwb Drm : - o Drm (gnvmMi, mMi, b`x, tJK, cKi, Lvj-iej, SYv, wngevn/Zlvi#vZ, fMf cwb)</li> <li>o esjv#`k wgv cwb Drm • RjR DTM I RjR cvYxi Rb" cwb c#qvRbxqZv I cwb gvb`ð • cwb cbtAveZb I cwitek msiyY cwb figKv • gybma\$Z cwb c#qvRbxqZv • cwb weixKiY : - o ci#veb - o tKwi#bkb - o ùUb - o cvZb	• GKK KvR : cv#I cwb wb#q MÜ, "v` MnY I wefb cKvi c`v_ wgvkZ K#i `eYxqZv cixyYi gva#g ag waviY </li> <li>• <b>GKK KvR :</b> cwb mstKZ wj#L Gi MVb A¼b</li> <li>• <b>`jMZ KvR : cwb Dr#mi wPÎ A¼b K#i e#jwUb tevW/tevW jvMvb esjv#`k wgv cwb Drm Kx Kx Zv LvZvq wjwce#KiY </li> <li>• <b>GKK KvR :</b> cwb#Z emevmKvix cvYx I D<sup>TM</sup>#`i bvg wj#L Kx ai#bi cwb emev#mi Dc#hMx Zvi e"vL"v emev#mi Rb" mVK gvb`Ê e"vL"v I tKvb #`i tKvbUj emevm Zvi e"vL"v c`vb Ges c#qvRbxqZv e"vL"v </li> <li>• <b>GKK KvR :</b> cwb Pμ A¼b I eYbv "vBW e"envi K#i cwb Pμ c`kb • GKK KvR : wPÎ AsKb K#i mv#jvK mstkiY eYbv • `jMZ KvR : cwitek msiyY cwb figKv e"vL"v wKQ cwbewnz tivMi bvg wjL#Z ejv Wvqviqv KviY I cWZKvi eYbv		• gybma\$Z cwb weÁvb fiEK e"vL"v w`Z nte

ØZxq Aa`vq : Rxeþbi Rb` cwb (18 wciqW)

Pjgvb-3

wkLbdj	welqe	wkLb tKLþbv wbþ`kbv	gj`vqb wbþ`kbv	wetkl tJLK wbþ`kbv
13. evsjvþ`þk cwb Drþm ûgwiKi cfe weþkIY KiþZ cviþe </p> <p>14. cwbi Drm msiþYi cþqvRbxqZv Ges tKþkj eYbv KiþZ cviþe </p> <p>15. cwlb cwlb mKj bvmwiþKi tgþjK AwaKvi Zv e`vL`v KiþZ cviþe </p> <p>16. cwlb cevþni mveRbxZv Ges Av`RwiZK wbqg bxZ eYbv KiþZ cviþe AbmÜvb 17. weix cwbi e`envi Ges m` Rxbhvcþb Gi cfe welþq AbmÜvb KvR ciþPjþv KiþZ cviþe 18. cwbi msKþUi (Mn`wj/KvI /wkþí e`envi) KvY AbmÜvb KiþZ cviþe gþbvþcþkR 19. weix cwbi e`envi I cwlb msiþYi mþPZbZv mwió jþY` tcv÷vi Aþb KiþZ cviþe AvþeMxq 20. cwbi Drþm cwbi `vfwieK cevn, `IYþiva welþq RbmþPZbZv mwió KiþZ cviþe	• evsjvþ`þk cwb Drþm ûgwiK (Threats to water resources in Bangladesh) • cwbi Drm msiþY Ges Dbqb (Sustainable development of water resources) • cwlb tgþjK AwaKvi • cwlb cevþni mveRbxZv Ges AvŠRwiZK wbqg bxZ			• cwbi Drþm RvZxq I Av`RwiZK ûgwiK Ges Gi cfevþei weÁvbwfiEK KvYmgn w`þZ nþe thb wkýv_x weþkIY KiþZ cviþe • cwbi Drm msiþY Ges Dbqþbi weÁvbwfiEK tKþkj eYbv KiþZ nþe

შეზღუდული პასუხისმგებლობის

(18 წელიწადი)

პიგვბ-4

შეზღუდული პასუხისმგებლობის	შეზღუდული პასუხისმგებლობის	შეზღუდული პასუხისმგებლობის	შეზღუდული პასუხისმგებლობის	შეზღუდული პასუხისმგებლობის
21. შეზღუდული პასუხისმგებლობის გუბერნიის ავტონომიური რესპუბლიკის კავშირების 22. შეზღუდული პასუხისმგებლობის გუბერნიის				

ZZxq Aa`vq : ü`hšš i hZ K_v

(16 wciqW)

wkLbdj	welqe	wkLb tkLtbv wbš`kbv	gj`vqb wbš`kbv	weškl t jLK wbš`kbv
eixeĖxq 1. iš³ i Dcv`vb Ges Gš`i Kvhµg e`vL`v KišZ cviŧe 2. iš³ Mšci `ekó` e`vL`v KišZ cviŧe 3. iš³ `vbsššii bxwZ e`vL`v KišZ cviŧe </p> <p>4. iš<sup>3</sup> MnšY cšqvRbxq mZKZv e`vL`v KišZ cviŧe </p> <p>5. iš<sup>3</sup> i weNZv/wek•Ljv mšó i KviY Ges djvdj e`vL`v KišZ cviŧe	- iš<sup>3</sup> i Dcv`vb Ges Gš`i Kvhµg - iš<sup>3</sup> i Mšci `ekó` - iš<sup>3</sup> `vbsššii bxwZ ( Principle of Blood Transfusion)</li> <li>iš³ MnšY mZKZv</li> <li>iš³ weNZv/wek•Ljv ( Disorders of Blood ) [w j DšKvgqv Ges _`vjvšmvgqv]	- ceeZx tkvYi ÁvbšK KvšR jwMšq cškvĖšii gvašg iš<sup>3</sup> i Dcv`vb i KvR mšúšK wkšv_xi AwfÁZv Dc`vcb GKK KvR : (tkvYi KvR) wkšv_xiv iš<sup>3</sup> i weifb Dcv`všbi 1wU KvR wjLŧe (tQvU KvMR wkšK w`ŧe Ges wkšv_xiv ZvšZ wjLŧe) `jxq KvR :</b> wkšv_xiv Zvš`i iš<sup>3</sup> i Mšci bvg i `ekó` e`vL`v Kiŧe BwšZ : A,B, AB I O Mšci iš<sup>3</sup> i bvg tevšW wjšL w`ŧeb weifb aišbi iš³ i Mšci `ekó` Dc`vcb (wkššKi KvR) - cškvĖšii gvašg iš<sup>3</sup> `vbsššii bxwZ Dc`vcb `jxq KvR :</b> o iš³ MnšY mZKZv MnšYi e`vL`v  o mZKZv MnY bv Kivi djvdj e`vL`v </li> <li><b>`jxq KvR : wbDšKvgqv I _`vjvšmvgqv mšó i KviY e`vL`v	iš³ i Mšci `ekó`i h_v_Zv iš³ MnšYi cšqvRbxq mZKZv e`vL`vi mšVKZv welqe`i h_v_Zv	GB Aa`vqvU t jLvi cše cšóie`, Wvšvimn wbf išhvM` Drm nšZ Z` msMn Kš i t jLv ešÁbxq G mšúšKZ I šqemvBU cš i `kb Kiv hvq

ZZxq Aa`vq : n`hʔʂi hZ K_v

(16 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb tkLʔbv wbʔ`kbv	gj`vqb wbʔ`kbv	welki ʔjLK wbʔ`kbv
6. kixʔi i ³ mÂvj b Kvµg e`vL`v KiʔZ cviʔe	- i³ mÂvj b - i³ bvx i KvR - i³ Pʔci fµgKv - ü`hʔʂi KvR	- cʔkvÊʔi i gva`tg welfb aiʔbi i³ bvx i bvg I KvR Dc`vcb `jxq KvR : i³ Pvc wbyq I Gi fµgKv e`vL`v  </li> <li>wfW I wPʔʔi gva`tg i<sup>3</sup> mÂvj b Kvµg ʔ`Lvʔbv </li> <li><b>GKK KvR :</b> ü`hʔʂi gva`tg i³ mÂvjʔbi cevn wPʔ Aʔb </li> <li>`jxq KvR : i<sup>3</sup> Pvc ciigvc Ges Av`k i³ Pʔci mvʔ_ Zjbv tkWY KvʔR mncwʔKi cvjmʔiU [KʔúvDŮvi/ʔUKʔbµkqʔbi/ɹdRµkqvb Gi mvnvʔh` i<sup>3</sup> Pvc ciigvc tkLʔbv ʔhʔZ cʔi] GKK KvR : i<sup>3</sup> PvcRµYZ 1wU mgm`v, KvY I ciZʔiva  </li> <li>cʔkvÊʔi i gva`tg Kʔjʔ÷ i j mʔúʔK Dc`vcb Ges PʔUi mvnvʔh` cKviʔf` I mµgv eYbv </li> <li>`jMZ KvR : Kʔjʔ÷ i j cZ`wkZ mµgvq ivLvi cʔqvRbxqZv I Dcvq e`vL`v [ʔQvU ʔQvU KvMʔR wky`xiv 1Uv Kʔi cʔqU wjLʔe]	i<sup>3</sup> Pvc ciigvc i mVKZv i<sup>3</sup> Pvc ciigvc i hʔʂi e`envʔi i mVKZv </p> <p>cvjmʔiU wbyʔqi mVKZv </p> <p>i³ PvcRµYZ mgm`v I ciZʔivʔai h_v_Zv Kʔjʔ÷ i j w`ó mµgvq ivLvi h_v_Zv   welqe`i h_v_Zv mgm`v wPyZKiʔYi h_v_Zv </p> <p>mVK Lv` MnʔYi KvYi h_v_Zv	1 bs Aa`vʔq (DbZi Rxbavi) kvixiK wduʔbm eRvq ivLvi ʔKʂkj eYbv Kiv nʔqʔQ  Gʔyʔʔ 1 bs Aa`vʔK ʔidvʔiY wnʔmʔe e`envi Kiv ʔhʔZ cʔi GKB ʔjLv cbivewi cʔqvRb ʔbB
7. m`Rxbhvcʔb Av`k i ³ Pvc, nvUueU, nvUʔiU Ges cvjmʔiU gʔa` mʔúK welkiY KiʔZ cviʔe	Av`k i³ Pvc, nvUueU, nvUʔiU Ges cvjmʔiU			
8. i ³ PvcRµbZ kvixiK mgm`v mʔi KvY I ciZʔivʔai ʔKʂkj e`vL`v KiʔZ cviʔe	i<sup>3</sup> PvcRµbZ kvixiK mgm`v - KvY I ciZʔivʔai ʔKʂkj			
9. kixʔi i ³ mÂvjʔb Kʔj ÷ ivʔj i fµgKv welkiY KiʔZ cviʔe	- Kʔj ÷ ivj - cKviʔf`</li> <li>mµgv</li> <li>i<sup>3</sup> mÂvjʔbi fµgKv</li> <li>(DcKwiZv I AcKwiZv)</li> <li>Kʔj ÷ ivjʔK cZ`wkZ mµgvq ivLvi cʔqvRbxqZv I Dcvq			
10. Kʔj ÷ ivjʔK cZ`wkZ mµgvq ivLvi cʔqvRbxqZv I Dcvq e`vL`v KiʔZ cviʔe				

ZZxq Aa`vq : ü`hšš i hZ K_v

(16 ¶c¶iqW)

Pjgvb-3

¶kLbd j	¶elqe	¶kLb †kL†bv ¶b†`kbv	gj`vqb ¶b†`kbv	¶e†kl †jLK ¶b†`kbv
11. i†³ mMv†ii fvimg`nxbZvi KviY, c¶Z†iva Ges c¶ZKv†i KiYxq e`vL`v Ki†Z cvi†e </p> <p>12. ü`hššK fv†jv ivLvi Dcvq eYbv Ki†Z cvi†e AbmÜvb 13. eqm Abhvqx i³Pvc I cvjm†iU Gi g†a` mœúK †jL¶P†Î `vcb Ki†Z cvi†e g†bv†c¶kR 14. i³Pvc, nvUueU, nvU†iU Ges cvjm†iU m¶VKfv†e ¶bYq Ki†Z cvi†e Av†eMxq 15. ü`hššK fv†jv ivLvi Rb` ¶b†R m†PZb n†e ,Ab`†`i m†PZb Ki†e	• i†³ mMv†ii fvimg`nxbZv - mgm`v, c¶Z†iva Ges c¶ZKvi • ü`hššK fv†jv ivLvi Dcvq o m¶VK Lv` ¶bevpb o m¶VK Rxebaviv AbmiY • i³Pvc, nvUueU, nvU†iU Ges cvjm†iU c¶igvc	• GKK KvR : i†³ mMv†ii fvimg`nxbZvi Kvi†Y mó mgm`v ¶P¶ýZKiY I c¶Z†ivagjK e`e`v MnY • `jMZ KvR :</b> ü`hššK fvj ivLvi Rb` Kx ai†bi Lv` MnY I eRb Kiv D¶Pr KviYmn e`vL`v • GKK KvR : Lv` Qvov Avi ¶Kfv†e ü`hšš fvj ivLv hvq Zvi e`vL`v	Lv` Qvov Ab` KviY, †jv†K m¶VKfv†e ¶P¶ýZ Kiv	

PZ_ Aa`vq : beRxe#bi mPbv (14 wciqW)

wkLbdj	welqe	wkLb tkL#bv wb#`kbv	gj`vqb wb#`kbv	wetkl tJLK wb#`kbv
eixEExq 1. eqtmÜKvj e`vL`v Ki#Z cvi#e 2. eqtmÜKvj#ji kvi#iK cieZ#bi KviY e`vL`v Ki#Z cvi#e 3. eqtmÜKvj#ji gvb#mK I AvPi#YK cieZ#b wb#R#K LvcLvIq#bvi Dcvq eYbv Ki#Z cvi#e 4. eqtmÜKvj#j ^`nK I gvb#mK <u>v</u> i#vi tK#kj e`vL`v Ki#Z m#y n#e  5. tU÷ wUDE teiei aviYv e`vL`v Ki#Z cvi#e  6. wj½ wbavi#Y ci#li figKv e`vL`v Ki#Z cvi#e	- eqtmÜKvj - eqtmÜKvj#ji ni#gvrRwbZ kvi#iK cieZb- - t`#ni D"PZv e#x</li> <li>t`#ni AvKvi cieZb - KU`i cieZb</li> </ul> </li> <li>eqtmÜKvj#ji gvb#mK I AvPi#YK cieZb</li> <li>eqtmÜKvj#j ^`nK I gvb#mK <u>v</u> - tU÷ wUDE teiei - gvb#li wj½ wbaviY	- c#kvE#i i gva`g eqtmÜKvj ("K#kvi) Dc`vcb `jMZ KvR :</b> eqtmÜKvj#j t`#ni D"PZv, AvKvi I KÉ`i cieZ#bi KviY e`vL`v </li> <li><b>GKK KvR :</b> eqtmÜKvj#j wk#v_xi wb#Ri gvb#mK I AvPi#YK cieZb I mgm`v wP#yZKiY GKK KvR : eqtmÜKvj#j wb#R#K ciZKj ci#tek n#Z i#vi c#evi Dcvq eYbv - g³ Av#jvPbvi gva`g tUó wUDE teiei aviYv e`vL`v </li> <li><b>`jMZ KvR : m#v#bi wj½ wbavi#Y ci#li figKv e`vL`v		- eqtmÜKvj Rxe#bi GK#U m#e`bkxj <u>i</u>   mvgwRK i#YkxjZvi Kvi#Y GB Bm`U g³ Av#jvPbvq Avmvi m#hvM cvq bv eqtmÜKvj#j gvb#mK I AvPi#YK cieZb Ges ^`nK I gvb#mK <u>v</u>#`i cieZb I LvcLvIq#bvi tK#kj i weAvb#f#EK Dc`vcbv _vK#Z n#e  G we#tq BD#b#md cYxZ Rxe#`yZvi wkLbmvgMx t`Lv th#Z ci#i

PZ_ Aa"vq : beRxe#bi mPbv

(14 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb tkL#bv wbt`kbv	gj"vqb wbt`kbv	wetkl tJLK wbt`kbv
7. eqtmÜKvjxb weev#ni v~ Sik Ges Gi cfve wetkIY Ki#Z cvi#e 8. Rxe#bi Drc#E Ges RxeRM#Z weeZ#bi aviYv e"vL"v Ki#Z cvi#e 9. c#_ex#Z bZb cRw#Zi Drc#Ei aviYv e"vL"v Ki#Z cvi#e AbmÜvb 10. wkÿv_xi GjvKvq eqtmÜKvjxb weevn I Mfavi#Yi v~ Sik cfve AbmÜvb Ki#Z cvi#e g#bvt#cikR 11. eqtmÜKvjxb weevn I Mfavi#Yi v~ Sik cfve wel#q tcv#vi A#b Ki#Z cvi#e Av#eMxq 12. eqtmÜKvj#ji kvix#iK c#ieZ#b wel#q wbtR m#PZb n#e Ges Ab#t`i m#PZb Ki#Z cvi#e	- eqtmÜKvjxb weevn I MfaviY- o v~ Sik o c#ievi I mgv#R Gi cfve - evsjv#t`#k weev#ni AvBbm#Z eqm - c#_ex#Z Rxe#bi Drc#E - weeZ#bi aviYv - bZb cRw#Zi Drc#E	`jMZ KvR : eqtmÜKvj#j weevn I Mfavi#Yi d#j v~ Sik wP#yZKiY Ges c#ievi I mgv#R Gi cfve e"vL"v - g³ Av#jvPbv gva#g weev#ni AvBbm#Z eqm Dc"vcb - g³ Av#jvPbv I c#kv#E#i i gva#g c#_ex#Z Rxe#bi Drc#E m#ú#K Dc"vcb - Qie, PvU e"env#i i gva#g weeZ#bi aviYv Dc"vcb - wkÿv_xi i AfÁZvi Av#jv#K c#kv#E#i i gva#g bZb cRw#Zi Drc#E Kxfv#e nq Zv Dc"vcb		tU÷ wUDE t#ei aviYv Ges GiU Kxfv#e ^Z#i nq m#t#y#c eYbv Ki#Z n#e

cÂg Aa`vq : t`L†Z n†j Av†jv PvB (15 ¶c¶iqW)

¶kLbdj	¶elqe	¶kLb †kL†bv ¶b†`kbv	gj`vqb ¶b†`kbv	¶e†kl †jLK ¶b†`kbv
e¶xeËxq 1. `c†Yi e`envi e`vL`v Ki†Z cvi†e 2. Av†jvi c¶ZmiY e`vL`v Ki†Z cvi†e 3. `úó Kvhµ†g †Pv†Li ¶µqv e`vL`v Ki†Z cvi†e </p> <p>4. ´úó `k†bi ¶bKUZg ¶e` e`vL`v Ki†Z cvi†e	`c†Yi e`envi ¶bivc` WvB¶fs</li> <li>cvn¶io iv`vi A`k` e¶K/cveZ` mo†K ¶ec`RbK e¶K [(Blind turns on Hilly Roads)] - Av†jvi c¶ZmiY - Av†giv Kxfv†e t`L†Z cvB- †Pv†Li ¶µqv</li> <li>´úó `k†bi ¶bKUZg ¶e`	- c†kvËi¶f¶ËK Av†jvPbvi gva`†g e¶e D`vni†Yi m¶v†h` mgZj `cY I †Mvjqxq `cY m¶ú†K ¶kyv_xi A¶fÁZv Dc`vcb `jMZ KvR :</b> cvn¶io iv`vi A`k e¶K/cveZ` mo†K ¶ec`bK e¶†Ki †y†Î `c†Yi e`envi †cv÷v†i Dc`vcb e¶oi KvR : ¶bivc` WvB¶fs Gi Rb` `c†Yi c†qvRbqxZv </li> <li><b>GKK KvR :</b> Av†jvi c¶Zmi†Yi aviYv m¶ú†K ¶kyv_xi A¶fÁZv Dc`vcb - Av†jvK i¶k¶i ¶µqv†iLv A¼b K†i †Pv†Li ¶µqv Dc`vcb </li> <li><b>`jMZ KvR : †Pv†Li ¶µqv †cv÷v†i Dc`vcb </li> <li><b>GKK KvR :</b> ´úó `k†bi ¶bKUZg ¶e`i aviYv m¶ú†K ¶kyv_xi A¶fÁZv Dc`vcb	†cv÷v†i Dc`vcb m¶VKZv </li> <li>e`vL`vi m¶VKZv </li> <li>aviYvi m¶VKZv </li> <li>†cv÷vi Dc`vc†bi m¶VKZv	ceeZx †k¶Y†Z ¶kyv_xiv `cY I c¶Z¶e¶ cW K†i†Q  ZvB G m¶ú†K cecv†Vi aviYv ¶`†q `c†Yi e¶e Rxe†bi e`envi †`Iqv th†Z cv†i

cÂg Aa"vq : †`L†Z n†j Av†jv PvB

(15 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb †kL†bv w†`kbv	gj"vqb w†`kbv	w†kl †jLK w†`kbv
5. †j†Yi ygZv e"vL"v Ki†Z cvi†e 6. †Pv†L †wU m†óí KviY e"vL"v Ki†Z cvi†e 7. †jY e"envi K†i †Pv†Li †wU m†kva†bi Dcvq eYbv Ki†Z cvi†e 8. †PvL fv†jv ivLvi Dcvq e"vL"v Ki†Z cvi†e AbmÜvb 9. †Pv†L †wU m†óí KviY AbmÜvb Ki†Z cvi†e Av†eMxq 10. †Pv†Li cWz hZ w†e Ges Ab†`i m†PZb Ki†Z cvi†e	• †j†Yi ygZv (Power of Lens) • †Pv†L †wU m†óí KviY • †jY e"envi K†i †Pv†Li †wU m†kva†b • †PvL fv†jv ivLvi Dcvq- - o m†VK c†ó MnY - o m†VK R†ebaviv AbmiY - o `b"b KvhK†g chvß Av†jvi e"envi</li> <li>o m†VK c×iZ†Z eB/c††Kv cov</li> <li>o K†w†DUvi e"envi (`iZ, Ae"vb, `xN†Y e"envi, BZ"v)	• c†kvE††f†EK Av†jvPbvi gva"†g †j†Yi ygZv abvZ†K I FYvZ†K m†ú†K †k†y_v_xi A†fÁZv Dc"vcb • †Pv†L †wU m†óí KviY Dc"vcb • `jMZ KvR : †Pv†L †wU (n"-`wó/`xN `wó) m†ó †cv÷v†i Dc"vcb †jY e"envi K†i †Pv†L †wU m†kva†bi Dcvq m†ú†K †k†y_v_xi A†fÁZv Dc"vcb • `jMZ KvR : †PvL fv†jv ivLvi Dcvq †cv÷v†i Dc"vcb </li> <li>• ewoi KvR : c†ov-c†Z†ekxi Kv†iv †Pv†L †wU m†óí KviY Ges H e"† i †Pv†Li †wU m†kva†bi Dcvq †cv÷v†i †j†L Av†e Ges †k†Y†Z c`kb K†e	• †cv÷v†i Dc"vc†bi m†VKZv • abvZ†K I FYvZ†K †jY e"env†i i m†VKZv • gZ†g†Zi m†VKZv • †Pv†Li †wU m†kva†bi m†VKZv	• †jY Kx†v†e e"†K `wóí †MvP†i Avbv nq m†P† eYbv w†`Z n†e

Iô Aa`vq : cıjgvi (13 wciqW)

wkLbdj	welqe	wkLb tkLtbv wb`kbv	gj`vqb wb`kbv	wetkl t jLK wb`kbv
eıxeEıq 1. cıKıZK I Kıİg cıjgvi e`vL`v KıtZ cviıe 2. cıjgviKıY cıııqv e`vL`v KıtZ cviıe 3. cıKıZK I Kıİg ZŠ I eııi Drm, ^eıkó Ges e`envi eYbv KıtZ cviıe </p> <p>4. ZŠ nıZ mZv ^Zııı cıııqv e`vL`v KıtZ cviıe </p> <p>5. wıfb cKvi mZvi ^eıkó e`vL`v KıtZ cviıe	- cıjgvi - cıKıZK - Kıİg - cıjgviKıY cıııqv - ZŠ I mZv (Drm, ^eıkó I e`envi) - cıKıZK - Kıİg - ZŠ nıZ mZv Drcb - wıfb cKvi mZvi ^eıkó	<p>tkıYi Kır</p> - tevıW wıLZ wıfb cıjgvi t_ıK cıKıZK I Kıİg cıjgvi kbv³KıY - Bı_ıbi gıa`tg cıjgviKıY cıııqv eYbv </li> </ul> <p><b>tkıYi Kır</b></p> <ul style="list-style-type: none"> <li>tevıW wıfb aiıbi (cıKıZK I Kıİg) mZvi wıLZ bıg t_ıK cıKıZK I Kıİg Zv kbv<sup>3</sup>KıY </li> <li>wıyK ZŠı aıb I Gı`ı Drm mıúıK aıYv eYbv <p>`jMZ Kır</b></p> <ul style="list-style-type: none"> <li>wıfıe ZŠmgn msMn Kıı wıfıe mZvı cııYZ Kiv nı Zvi e`vL`v  </li> <li>eBıqi AsıKZ wıé Iqıgi RıebPııı gıa`tg wıé mZv msMn eYbv <p>eııoi Kır</p> - eısvı`tk wıé ^Zıı Kııjı yıZKı w`K eYbv		

⚡Lbdj	⚡lqe	⚡Lb †kL†bv ⚡b†`kbv	gj`vqb ⚡b†`kbv	⚡e†kl †jLK ⚡b†`kbv
6. ievi l c⚡÷†Ki †fšZ l ivmṽqbK ag e`vL`v Ki†Z cvi†e 7. c⚡i†e†ki fvimṽg`nxbZv mṽó†Z ievi l c⚡÷†Ki fṽgKv e`vL`v Ki†Z cvi†e </p> <p><b>AbmÜvb</b> 8. Zvc c†qvM K†i ⚡eṽfb cKvi mZvi `eṽkó` kbv<sup>3</sup> Ki†Z cvi†e </p> <p><b>Av†eMxq</b> 9. c⚡i†e†ki fvimṽg` iṽvq ivevi l cṽó†Ki e`envi l msiṽ†Y Ab`†` i†K m†PZb Ki†Z cvi†e	• ievi l c⚡÷K • c⚡i†e†ki fvimṽg`nxbZv	†kṽYi KvR ⚡KQ c⚡÷†Ki `Zṽi ⚡Rṽb†mi bvg e`envi ⚡jL†e eṽoi KvR †Kvb †Kvb `eṽk†ó`i Rb` c⚡÷K GZ c†qvRbxq?</p> <p><b>cixY</b> • msMnKZ mZv (cotton), cvU, Dj, ⚡j†jb, ṽmṽ, †iqb, bvBjb, c⚡j÷vi Ges GṽμṽjK Avjv`v Avjv`v fv†e ⚡PgUv ṽ`†q a†i Le mveavbZvi mv†_ †cvov†e †cvovi aib, is cṽieZb, MÜ Ges ch†eṽYKZ mKj `eṽkó` ⚡jṽce× Ki†e ⚡kṽK †Kvb ,†jv †mj†jṽRK, †Kvb,†jv bb †mj†jṽRK Zv e`vL`v Ki†eb		

mBq Aa'vq : Aa, yviK I jeYi e'envi (17 wciqW)

wkLbdj	welqe	wkLb tKLtbv wbt`kbv	gj`vqb wbt`kbv	wetkl tJLK wbt`kbv
eixeExq				
1. k ³ kvjx I `ej GimWi e'ekó" e'vL'v KiZ cvi	• k <sup>3</sup> kvjx I `ej GimW	• GKK KvR : o tje, Kgjv, tZZtji im, wf#bMvi, `a Ges wfUwgb im tUetjU ,ov Kti cwb tmc Kti ZvtZ jvj I bxj wjUgvm tccvi thvM Kiv  chteyY wjice× Kiv  o HCl/HNO <sub>3</sub> /H <sub>2</sub> SO <sub>4</sub> G jvj I bxj wjUgvm tccvi thvM Kiv Gt`i gta" tKvb,tjv `ej I tKvb,tjv k ³ kvjx GimW Zvi e'vL'v		
2. cvZ'wnK Rxe#b GimWi e'envi Ges mvearbZv e'vL'v KiZ cvi	• cvZ'wnK Rxe#b GimWi e'envi Ges mvearbZv	AbmÜvbgjK KvR • evsjvt`tk GimW mšvm, KviY I cWZKvi		
3. GimW Ace'envt i i mvgwRK cfve wetkIY KiZ cvi	• GimWi Ace'envi,AvBbKvbb Ges mvgwRK	• GKK KvR o wKQ GimWi ms#KZ wj#L me,tjvtZB th c_g nvBtWtRb cigvY DcWZ Zv kbv ³ KiY o Rjxq `etY GimW H+ wetqWRZ nq Ges GUB jxUgv#mi ev cwieZtbi Rb" `vqx Zv mwvš MnY o wf#bMvi I H ₂ SO ₄ AvqibZ nIqvi nv#ii Dci `ej I k <sup>3</sup> kvjx GimWi aviYv c`vb teiki fvm `Re GimW `ej Ges ARe GimW k ³ kvjx		
4. wbt`kK e'envi Kti wefb e'i AaZ I yviZ wPrýZ KiZ cvi  (wjUgvm, ctei tkIYtZ ^ZiKZ dj meIRi wbt`kKi mrvn#h)	• wbt`kK e'envi Kti wefb e'i ( gwiU, t÷, wefb Lv`e") AaZ I yviZ kbv ³ KiY • cvK`wjZ GimWUi KviY Ges mVK Lv" wbevPb/kbv <sup>3</sup> KiY	• GKK KvR `ej Ges k ³ kvjx GimW kbv ³ KiY		
5. cvK`wjZ GimWUi KviY Ges mVK Lv" wbevPb e'vL'v KiZ cvi				
6. c`vt_i pH Gi gvb Rvbi c#qRbxqZv e'vL'v KiZ cvi	• pH Gi gvb Rvbi c#qRbxqZv			
7. yvi#Ki i mvqibK e'ekó" e'vL'v KiZ cvi	• yvi#Ki i mvqibK e'ekó"			
8. cvZ'wnK Rxe#b yvtii c#qRbxqZv Ges e'envt i i mvearbZv e'vL'v KiZ cvi	• cvZ'wnK Rxe#b yvtii e'envi Ges mvearbZv			

mBq Aa`vq : Aa, yviK I jeYi e`envi

(17 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb tkLtbv wbt`kbv	gj`vqb wbt`kbv	wetkl tJLK wbt`kbv
9. ckg#bi c#qRbxqZv e`vL`v Ki#Z cvi#e 10. cvZ`wnK Rxe#b ckg#bi c#qRbxqZv e`vL`v Ki#Z cvi#e </p> <p>11. jeYi ivmvqibK `ekó` e`vL`v Ki#Z cvi#e </p> <p>12. cvZ`wnK Rxe#b jeYi c#qRbxqZv e`vL`v Ki#Z cvi#e cixyv 13. cixY#Yi gva`tg wefb cKvi jeY`Zwi Ki#Z cvi#e (avZ+GimW, avZi A·vBW + GimW) Av#eMxq 14. Avgv#`i cvZ`wnK Rxe#b Aa, yvi I jeY Gi Ae`vb#K cksmv Ki#e	- ckgb Ges Gi c#qRbxqZv - jeYi ivmvqibK `ekó` - jeYi e`envi(Mn^{-v}jx, Kwl, kfi)	- jeY thgb Lvevi jeY, Pbvcv_i, Lvevi tmvWv, Kvco KvPvi tmvWv, Kcvi gvj#KU, cUwkqvg bvB#UU meB wefb GimWRvZ CO₂ I H₂ ^Zwi#Z GimW AZ`vek`Kxq, wefb ivmvqibK `e`, e`vUwii inventov mvi, wetuviK ^Zix#Z tivM cvZ#iv#a Gim#Wi e`vck e`envi eYbv </li> <li><b>GKK KvR :</b> <ul style="list-style-type: none"> <li>GimW e`env#i Kx Kx mveavbZv Aeja#b Kiv I AmveavbZvq Kx Kx Amveav n#Z cv#i Gi e`vL`v - Q#Ki mrv#h` wefb wbt`kK (vjUgvm, td#bvd#_jyb, nj`, wetUi I MvR#ii im)Gim#W I yi#K c`kb `jMZ KvR :</b> <p>P#bi cvwb#Z Avjv`v Avjv`vfv#e vjUgvm, nj#`i, wetUi, MvR#ii im thM Ki#e i#0i cieZb t`#L GvU tm yvi Zv m#vš MnY tKvb Avq#bi Rb` i#0i cieZb nq e`vL`v </p> GKK KvR : <p>PviU yv#ii m#KZ vj#L AvqibZ nIqv c`kb </p>		

Αόγ Αα`νq : Αγγτ`i mαú` (13 wciqW)

wkLbdj	welqe	wkLb tkLtbv wb`kbv	gj`vqb wb`kbv	wetkl t jLK wb`kbv
ewxeExq - gwU l fwi ^ekó" e`vL`v KiZ cvi`e </li> <li>wefb cKvi gwUi gta` c`v_K` KiZ cvi`e </li> <li>gwUi MVb e`vL`v KiZ cvi`e - gwUi pH gvb Rvbvi c`qvRbxqZv e`vL`v KiZ cvi`e - gwU `lYi KviY, djvdj Ges gwU msiyYi tKskj eYbv KiZ cvi`e - gwUz Ae`Z LrbRi tfsZ l imvqibK ag e`vL`v KiZ cvi`e - LrbRi e`envi Ges msiyYi tKskj eYbv KiZ cvi`e - cviZK Rvjvbi Drm Ges Gt`i MVb e`vL`v KiZ cvi`e - cviZK Rvjvbi MVb, cμqvKiY ,e`envi Ges msiyYi tKskj eYbv KiZ cvi`e cixYv - wkyv_xi GjkVq gwU `lYi KviY l djvdj AbmÜvb KiZ cvi`e - pH tccvi w`q gwUi pH wYq A_ev jUgm tccvi w`q gwUi Aoz l yviZ wYq KiZ cvi`e </li> </ol> <p><b>AvteMxq</b></p> <ol style="list-style-type: none"> <li>mαú` msiyYi hZevb nte l Abt`i mPZb Ki`e	- gwU l fwi ^ekó": - gwUi MVb - gwUi cKvi t`</li> <li>pH gvb Rvbvi c`qvRbxqZv - gwU `lYi KviY l djvdj</li> <li>msiyYi tKskj</li> </ul> </li> <li>gwUz Ae`Z maviY LrbR (Minerals) : - tfsZ l imvqibK ag - e`envi</li> <li>msiyYi tKskj</li> </ul> </li> <li>evsjv`tk cviZK Rvjvbi Drm: (Kqv, t`Uwjvg Ges M`vm) - MVb (Formation) - cμqvKiY (Processing) - e`envi - mxgveXZv l msiyY	<p>`jMZ KvR</b></p> <ul style="list-style-type: none"> <li>wB wB R GjkV t`K Avbv gwUi ^ekó" l fwi mαú`K aviYv e`vL`v</li> </ul> <p><b>ewoi KvR</b></p> <ul style="list-style-type: none"> <li>wB wB R emvq l t`tki ewotZ wK wK aitbi dmj, Dm` nq wgj Kti</li> </ul> <p><b>cixY</b></p> <ul style="list-style-type: none"> <li>wkyv_xt`i wefb cKvi gwU w`k`q ZvZ cwb w`k`Z Kti wKQY t`iL w`q chetyYKZ djvdj wjLte - gwUi MVb cμqv, cKvi, Dcv`vb Ges wPt`i gva`g gwUi i t`tejs Kti ^ekó" eYbv <p>cixY</p> `jMZfvte ewj gwU, Avkh³ gwU l Kv`vgwUz Aí cwb w`k`q ej - wMijÜve - wis`Zii tPón Ki`e Zv t`K ^ekó" eYbv </li> </ul> </li> <li>pH t`tji aviYv t`teb Ges mVK Aoz l yviKZ wYtqi c`qvRbxqZv e`vL`v - PvUi gva`g tKvb meir wK c`igvc pH gvtbi gwUz fvj nq Zv wjL w`teb	- welqe`i mVKZv </li> <li>welqe`i mVKZv - mVK mg`q KvRU Rgv t`lqv - h_vh_ cμqv AbmiY - cZte`b iPbv </li> <li>h_vh_ cμqv AbmiY </li> <li>cZte`b iPbv	

beg Aa`vq : `thvMi mv_ emevm

(14 wciqW)

wkLbdj	welqe	wkLb tkLtbv wb`kbv	gj`vqb wb`kbv	wetkl t jLK wb`kbv
eixEeq 1. evsjv`k I AvSRwZK tcÿvcU Rjevqi cieZ#bi cfve wetkIY Ki#Z cvi#e </p> <p>2. ciitekMZ mgm`v míoí KviY e`vL`v Ki#Z cvi#e 3. `thvM míoí KviY, ciZ#iva, tgvKv#ejvi tKškj Ges ZvrÿYK KiYxq e`vL`v Ki#Z cvi#e	<p>Rjevq cieZ#bi cfve</p> • evsjv`k</li> <li>• AvSRwZK tcÿvcU</li> </ul> <p>ciitekMZ mgm`v</p> • RbmsL`v eix (Population growth)</li> <li>• bMivqY (Unbanization)</li> <li>• ^eikK DòZv (Global warming)</li> <li>• Kveb `IY (Carbon pollution) • ebkb` Kiv ( Deforestation)</li> </ul> <p>`thvM míoí KviY, ciZ#iva, tgvKv#ejvi tKškj Ges ZvrÿYK KiYxq :</p> • eb`v • Liv • mvB#Kvb • U#b#Ww • mbwqg • figKáú • GimW eió (Acid rain)	• GKK KvR : AvenvIqv I Rjevqi aviYv m#ú#K wkÿv_xi AwfÁZv Dc`vcb </li> <li>• Rjevqi wbgvgK, #jv Pv#U Dc`vcb • `jMZ KvR :</b> evsjv`k#i Rjevqi cieZ#bi cfve tcv÷v#i Dc`vcb </li> <li>• <b>ewoi KvR :</b> AvSRwZK tcÿvcU Rjevqi cieZ#bi cfve eYbv </li> <li>• ciitekMZ mgm`vi KviY, #jv Kx Zv wkÿv_x#`i Av#jvPbv t_#K wPvYz K#i tev#W t jLv </li> <li>• <b>GKK KvR :</b> ciitekMZ mgm`v m#ú#K wkÿv_xi AwfÁZv Dc`vcb </li> <li>• <b>`jMZ KvR : RbmsL`v eix Kxfv#e ciitekMZ mgm`v mío K#i Zv tcv÷v#i Dc`vcb </li> <li>• <b>ewoi KvR :</b> RbmsL`v eixi d#j M#gi tP#q kn#i ciitekMZ mgm`v teik n#e tKb-hw<sup>3</sup> mnKv#i e`vL`v Ki	• tcv÷v#i welqe`i Dc`vc#bi mVKZv • ewoi Kv#Ri mVKZv • tcv÷v#i Dc`vc#bi mVKZv • ewoi Kv#Ri mVKZv	• AvenvIqv I Rjevq Ges Rjevq cieZ#bi KviY wkÿv_xiv 6ð-8g tKwY#Z Aa`qb K#i#Q  ZvB ce cv#Vi ciwPiz w`#q Rjevq cieZ#bi cfve wetkIY Kivi Dcv`vb eB#Z LvK#Z n#e </li> <li>• `thvM míoí weÁvbwfiEK KviY e`vL`v Ki#Z n#e • ciZwU `thvM míoí KviY, tgvKv#ejvi tKškj I ZvrÿYK KiYxq mgršZ fv#e e`vL`v Ki#Z n#e </li> <li>• ciitekMZ mgm`vi weÁvbwfiEK KviY e`vL`v Ki#Z n#e

wkLbdj	welqe	wkLb tkLtbv wb#`kbv	gj`vqb wb#`kbv	welkl tjkLK wb#`kbv
4. m⁻ Rxbhvc#b gvbma\$Z I DbZ cwiite#ki , i#Z we#kIY Ki#Z cvi#e 5. cK#Z msi#YkxjZvi Zvrch we#kIY Ki#Z cvi#e 6. cK#Zi msi#YkxjZvi weifb tK#kj eYbv Ki#Z cvi#e AbmÜvb 7. wk#v_x GjvKvq gvbma\$Z I DbZ cwiitek m#ó i mgm#v I P#vjÄ tgvKv#ejvq GK#U AbmÜvb KvR m#úb Ki#Z cvi#e g#bv#c#kR 8. `thvM c#Z#iva Ges `thv#M KiYxq we#q mgvR#K m#PZb Kiv we#q tcv#vi A#b Ki#Z cvi#e 9. cK#Zi msi#YkxjZvi c#qvRbxqZvi we#q mvgwRK m#PZbZv m#ó we#q tcv#vi A#b Ki#Z cvi#e Av#eMxq 10. cwiitek msi#Y#Y mgv#R m#PZbZv m#ó i D#`vM MnY Ki#Z cvi#e	• gvbma\$Z I DbZ cwiite#ki , i#Z • cK#Z msi#YkxjZvi Zvrch (Signifacance of conservation of nature) • cK#Zi msi#YkxjZvi weifb tK#kj	• `jMZ KvR : cK#Zi Dcv`vb , #jv msi#Y Kivi c#qvRbxqZv e#vL#v • `jMZ KvR : cK#Zi msi#YkxjZvi tK#kj/Dcvq , #jv wP#yZKiY  we: `: tcv#vi tccvi		

`kg Aa`vq : G#mv ej#K Rwb (15 wciqW)

wkLbdj	welqe	wkLb tKL#bv wb#`kbv	gj`vqb wb#`kbv	wetkl tJLK wb#`kbv
ewxeExq 1. e⁻i RoZv I et#ji ,YMZ aviYv wDU#bi M#Zi c_g m#i mvnv#h" e"vL"v Ki#Z cvi#e 2. RoZvi e'enwiK AfÁZv e"vL"v Ki#Z cvi#e 3. wefb cKvi et#ji cK#Z e"vL"v Ki#Z cvi#e 4. e'enwiK Rxe#b NI#Yi mweav eYbv Ki#Z cvi#e 5. w⁻vZ I M#Zi Ici et#ji cfve e"vL"v Ki#Z cvi#e 6. wDU#bi M#Zi wØZxq m#i e'envi K#i et#ji cigvc Ki#Z cvi#e 7. wDU#bi M#Zi ZZxq m#i mvnv#h" msM#VZ 4#U Rb#cq Nubv e"vL"v Ki#Z cvi#e cix#y 8. mnR cix#y#Yi mvnv#h" ej cigvc Ki#Z cvi#e Av#eMxq 9. Avgv#`i Rxe#b et#ji c#qvRbxqZv Dc#j#ä Ki#Z cvi#e	• RoZvi Ges et#ji aviYv-wDU#bi M#Zi c_g m#i • RoZvi e'enwiK AfÁZv • et#ji cK#Z - o ⁻úk ej - o NIY ej Ges Gi mweav - A⁻úk ej - gnvKl ej - Z#orP#Kxq ej `ej wDKxq ej - k³ kvjx wDKxq ej • w⁻vZ I M#Zi Ici et#ji cfve • et#ji cigvc - wDU#bi M#Zi wØZxq m#i • wμqv I c#Zμqv ej - wDU#bi M#Zi ZZxq m#i - Rb#cq wKQ Nubv (4#U)	• ej c#qv#M ZiY N#U tKb Zv wefb D`vniY w`#q e"vL"v • `jMZ KvR:</b> <ul style="list-style-type: none"> <li>wØZxq m#i mvnv#h" e"vL"v ØGK#U Dc#i i w`#K wbyß e⁻ Dc#i D#V Ges w#P G#m c#o# • cix#yY (`jMZ KvR):</b> <ul style="list-style-type: none"> <li>mnR cix#y#Yi mvnv#h" ej cigvc</li> </ul> </li> <li>• <b>`jMZ KvR : KvY e"vL"v ✓ Lv#U tKvqv Ae⁻vq wμqv c#Zμqv ✓ M#oi M#Z nVv e#x t#j hv#xi t#j cov • ewoi KvR : Avgv#`i Rxe#b et#ji cfv#ei e"vL"v	• Dc#i DV Ges w#P G#m covi KvY e"vL"v h_vZ_v • Z⁻ msM#ni m#VKZv • DcKiY e'envi i m#VKZv • djvd#j i i#Zv	• wDU#bi m#i msÁv Ges we⁻vZ ebYv t`evi c#qvRb tbB </li> <li>• e<sup>-</sup>e Ges P#icv#k msN#VZ Nubv m#_ wDU#bi m#i aviY#K m#u#KZ Ki#Z n#e </li> <li>• et#ji e'envi Ges NIYbi R#eb N#bô D`vniY w`#Z n#e

GKv`k Aa`vq : cvZ`nK Rxe#b Rxe ch³ (16 wciqW)

wkLbdj	welqe	wkLb tkL#bv wb`kbv	gj`vqb wb`kbv	wetkl tJLK wb`kbv
ewxeE`xq				
1. PwiwîK ^ekó eskciáivq vbiš#i i tkškj e`vL`v Ki#Z cvi#e	- esk ciáivq PwiwîK ^ekó enbKvix Dcv`vb - o tμv#gRvg - o Rxb - o AviGbG - o WGbG	- GKU ciev#i i gy-evev I mšv#`i (wZb tRbv#ikb) wPÎ t`wL#q gy-evev i mv#_ mšv#bi wgj , #jv j ý K#i g<sup>3</sup> Av#jvPbvi gva`tg eww`K ^ekó , #jv wPyZKiY I Dc`vcb </li> <li>BwZ : eww`K ^ekó -Pj , tPv#Li giY , tPnviv `jMZ KvR :</b> PwiwîK ^ekó enbKvix Dcv`v#bi KvR I evev gv#qi mv#_ mšv#bi wgj _vKvi KviY e`vL`v GKK KvR : wkÿv_xi ciev#i i m`mM#Yi PwiwîK ^ekó i wgj -Avgj wPyZKiY (Pj , is, D`PZv , tPnviv , tPv#Li giY) - gybe Rxe#b WGbG tU÷ Gi c#qvRbxqZv Av#jvPbvi gva`tg Dc`vcb - tR#bUK weNZvi (Genetic Disorder) KviY I djvdj D`vniY I wP#îi mvin#h` Dc`vcb</li> <li>wPÎ , PvU , D`vniY Gi gva`tg Rxech³ I tR#bUK BwAbqwis Dc`vcb	mšv#bi mv#_ evev-gv#qi wgj _vKvi KviY kbv<sup>3</sup> Ki#Yi h_v_Zv	WGbG tU#ó i we`wiZ weeiY c#qvRb t#B  GwU tKb Kiv nq Ges Gi wbf i#hM`Zv wel#q msiÿß e`vL`v w`#Z n#e
2. WGbG tU#÷ i c#qvRbxqZv e`vL`v Ki#Z cvi#e	WGbG tU÷			
3. tR#bUK weNZvi (Genetic Disorder) KviY I djvdj eYbv Ki#Z cvi#e	tR#bUK weNZvi- djvdj			
4. Rxech ³ Ges tR#bUK BwAbqwis e`vL`v Ki#Z cvi#e	Rxech³ Ges tR#bUK BwAbqwis Gi aviYv		Rxech³ i	Dw` I cvYxi tevjwbs Gi mvgwRK cfve Gi mibw`ó D`vniY w`#q e`vL`v w`#Z n#e </li> <li>cvYx tKvjwbs Gi Aif cfve Gi aviYv w`#Z n#e

GKv`k Aa`vq : cvZ`wnK Rxeþb Rxe chw³ (16 wcriqW)

Pjgvb-2

wkLbdj	welqe	wkLb tkLþbv wbþ`kbv	gj`vqb wbþ`kbv	weþkl þjLK wbþ`kbv
5. cvYx I Dv`mþ` þKwbs e`vL`v KiþZ cviþe 6. þKwbs Gi mvqvRK cfve weþkIY KiþZ cviþe 7. þRþbUK Bv`Äbqv`is I evþqv þUKbþjvRxi e`envi Ges Gþ`i mdj weþkIY KiþZ cviþe AbmÜvb 8. cwiþeþi m`m`MþYi gþa` Pwi`îK ^e`kþó`i mv`k` I ^emv`k` AbmÜvb KiþZ cviþe 9. wkýv_xi GjvKvq þRþbUK Bv`Äbqv`is I Rxechw³ i e`envi I Rxeþb Gi mdj AbmÜvb KiþZ cviþe </p> <p><b>AvþeMxq</b></p> <p>10. Pwi`îK ^e`kó` eskciþúivq vþvšþi ckwiZi Ae`vbþK cksmv KiþZ cviþe </p> <p>11. Avgþ`i Rxeþb þRþbUK Bv`Äbqv`is I Rxechw³ i Ae`vbþK cksmv KiþZ cviþe	• þKwbs- UvÝþRþbK c`vU Ges Gvbg`vj • þKwbs Gi mvqvRK cfve • þRþbUK Bv`Äbqv`is I Rxechw<sup>3</sup> Ges Gþ`i e`envi I mdj - o K`l</li> <li>o dþibwmK</li> <li>o MncwvZ ci Ges `»RvZ `e` - o Lv` c`µqvKiY - o Jla c`ZKiY	þkwi KvR • wkýv_xi GjvKvq Rxechw³ I þRþbUK Bv`Äbqv`is G e`envi e`vL`v </li> <li>• cvYx I Dv`mþ` i þKwbs Qve, PvU, wfwl Gi gva`þg Dc`vcb </li> </ul> <p><b>þkwi KvR :</b></p> <ul style="list-style-type: none"> <li>• þKwbs Gi mvqvRK Kdj weþkIY </li> <li>• <b>`jMZ KvR : welqe`i th þKvb `BvUi þRþbUK Bv`Äbqv`is I Rxechw³ e`envi i mdj weþkIY	e`envi i h_v_Zv • þKwbs Gi mvqvRK Kdþji weþkIþYi h_v_Zv	• mstýþc þRþbUK Bv`Äbqv`is I Rxechw³ ,Gþ`i e`envi I Avgþ`i Rxeþb Gi mdj mwbv`ófvþe DþjL_vKþZ nþe thb wkýv_x mþúK ^Zwi KiþZ cvþi, Gi Ae`vbþK cksmv KiþZ cvþi

Øv`k Aa`vq : Rxeþb Zlor (18 wciqW)

wkLbdj	welqe	wkLb tkLþbv wbþ`kbv	gj`vqb wbþ`kbv	wetki t jLK wbþ`kbv
ewxeExq 1. Zlor Dcvsk I hš cZxþKi mwnvþh` cKvk KiþZ cviþe </p> <p>2. e`vUwii Kvþug e`vL`v KiþZ cviþe 3. evmv ewoiþZ e`envi DcþhvMx eZbx bKkv cYqb KiþZ cviþe </p> <p>4. Zlor wetkiY Ges Zlor cþjcb cKqv e`vL`v KiþZ cviþe </p> <p>5. cvZ`wnK Rxeþb Zlor wetkiþYi Ges Zlor cþjcbi , iæZ eYbv KiþZ cviþe 6. wKþjvIqv I wKþjvIqv NÈv e`vL`v KiþZ cviþe	- cZxK : [mBP (GKgLx, wØgLx), tKvI, e`vUwii, w`i tiva, cwiZbkxj tiva, Zlor Dm (Gwm Ges wWm), wDDR, t jwW A`wigUvi, t f v èigUvi, M`vj fvþbwigUvi, f msþhvM, AvovAwø Zvi, tcPvþbv Zvi , aviK] - e`vUwii Kvþug</li> <li>emv ewoi DcþhvMx Zlor eZbx bKkv cYqb</li> <li>Zlor wetkiY Ges Zlor cþjcb cµqv</li> <li>cvZ`wnK Rxeþb Zlor wetkiY Ges Zlor cþjcbi , iæZ - wKþjvIqv Ges wKþjvIqv NÈv	- cZxK AsKb Kþi Zlor hš I DcKiY cwiwPZKiY (GjvKvi GKRB Bþjwþkqvþbi mwnvþh` Zlor hš I DcKiY c`kb Kiv thþZ cviþi) GKK KvR: - Zlor hš I DcKiþYi cZxK e`envi Kþi eZbx A¼b </li> <li>wPÎ A¼b Kþi e`vUwii Kvþug mæþK AvþjvPbv cixÿ - wkÿv_xiv eZbx bKkv A¼b Kiþe, eZbx ^Zii Kiþe Ges t jwW e`envi i (GKwaK evj) Kþi Gwm Dm e`envi Kþi eZbx h_v_v c`kb Kiþe </li> <li>Zlor wetkiY Ges Zlor cþjcb cµqv eZbx AsKb Kþi e`vL`v</li> </ul> <p><b>cixÿY</b></p> <ul style="list-style-type: none"> <li>cixÿvi mwnvþh` Zlor wetkiY c`kb	- cZxK e`envi i mVKZv - eZbx AsKþbi i xZv - eZbx AsKþbi i xZv - eZbx ^Zii mVKZv - eZbxþZ Zlor cevþni DcwiZ - eZbx AsKþbi h_v_Zv - eZbxþZ Zlor cevþni DcwiZ - ZloþZi cþjcb nþqþQ wKbv wbiðZKiY	ceeZx w`i eZbx ^Zii I Gi e`envi mæþK AvþjvPbv nþqþQ GLvþb mvariY eZbx (GKwaK t jwW cþqU) ^Zii tKškj mgn nvþZ Kjþg tkLvi e`e_v KiþZ nþe  tkwY I mgnšivj eZbx mgšq I e`envi _vKþe Kxfvþe eZbx bKkv AsKb KiþZ nq Ges tm Abmþi Zv Kvþi tevþW ^Zii KiþZ nq Zvi D`vniY _vKþe  wkÿv_x tkwYþZ/e`enwiK Kvþm eZbx ^Zii I c`kb Kiþe </li> <li>GB Aa`vq AbmÜvbgjK KvR/cixÿþYi Rb` 8 wciqW eivÎ ivLþZ nþe  emK 10 wciqþWi Rb` welqe _vKþe hvi mwnvþh` wkÿv_x Ab`vb` wkLbdj ARb KiþZ cviþe

Øv`k Aa`vq : Rxeþb Zlor (18 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb tklþbv wþ`kbv	gj`vqb wþ`kbv	wetkl tjlK wþ`kbv
7. ^e`wZK ygZvi wnmve KiþZ cviþe </p> <p>8. GbwR evj Gi mweav e`vL`v KiþZ cviþe </p> <p>9. AvBwGm Ges BDwGm Gi Kvhwg I e`envi e`vL`v KiþZ cviþe 10. wmt÷g jm Ges tjw tklWs e`vL`v KiþZ cviþe 11. Dbqb Kvhwg we`þZi Ae`vb e`vL`v KiþZ cviþe cixv 12. ewv ewoþZ e`envi DcþhWx eZbx Ges Gi e`envi c`kb KiþZ cviþe </p> <p>13. cixvvi mwnvth` Zwoneþkly c`kb KiþZ cviþe </p> <p><b>gbvþcukR</b></p> <p>14. Zlor DcKiY I hšcwZi mwVK e`envi mÿg nþe AvþeMxq 15. ZoþZi AcPq tivþa hZevb nþe Ges Ab`þ`i mþPZb KiþZ cviþe	• ^e`wZK ygZvi wnmve</li> <li>• GbwR tmlfs evj Gi mweav</li> <li>• AvBwGm Ges BDwGm Gi Kvhwg I e`envi • we`þZi wmt÷g jm Ges tjw tklWs- tciÿZ evsjvþ`k	• ev`e D`vniY e`envi Kþi Zlor wetkly Ges Zlor cþjcþbi , iþZ Dc`vcb • g³ AvþjvPbvi gva`tg wKþjvIqv Ges wKþjvIqv NEvi e`vL`v </li> <li>• ^e`wZK ygZvi wnmve Kivi dgjv Dc`vcb Ges iwkmgtþni gvb wbyq </li> </ul> <p><b>þklyi KvR:</b></p> <ul style="list-style-type: none"> <li>• dgjv e`envi Kþi ^e`wZK ygZvi wnmve wbyq </li> <li>• cþkvËi wfiËK AvþjvPbvi gva`tg GbwR tmlfs evþji mweav Dc`vcb </li> </ul> <p><b>cixv</b></p> <p>3 bþi wkLbdþji Rb` c`Ë cixvY </p> <p>4 bþi wkLbdþji Rb` c`Ë cixvY </p> <p>ewoi KvR :</p> • ZoþZi AcPq tivþa mgvþR mþPZbZv mwói Dcvq eYbv	• dgjv e`envi i mwVKZv</li> <li>• GKK e`envi i mwVKZv	

Îtqv`k Aa`vq : mevB KvQvKvQ

(14 wciqW)

wkLbdj	welqe	wkLb tKLtbv wbt`kbv	gj`vqb wbt`kbv	wetkl tJLK wbt`kbv
e×eËq 1. Z_` thvMvthvMi gjbxZ e`vL`v KiZ cvi`e 2. eK wPÎ e`envi Kti thvMvthvM cμqv efb avcmgn eYbv KiZ cvi`e 3. gvBtμvdvb Ges w`cKvii Kvμg e`vL`v KiZ cvi`e 4. GbvjM Ges wWvRUvj msKZi e`vL`v KiZ cvi`e </li> <li>5. wWvRUvj msKZi mēav eYbv KiZ cvi`e 6. eK wPÎi mrvth` Z_` I thvMvthvM chw³ msμvš cavb cavb hšcwZ (tgikb) Kvμg, Zv`i mēav Ges Rxe`b G, tji e`envi eYbv KiZ cvi`e	• Z_` thvMvthvMi tgšjK bxZgvjv</li> <li>• Z_` thvMvthvM cμqv efb avc (eK wPÎmn) • gvBtμvdvb Ges w`cKvii Kvμg (wPÎmn)</li> <li>• GbvjM msKZ I wWvRUvj msKZ Ges Gt`i mēav • Z_` I thvMvthvM chw<sup>3</sup> wfvBR- o tiwI o tUvjwfk o tdvb (w`_i I tgevBj) o d`v · tgikb o KμcDUvi Gt`i Kvμg ,e`envi Ges mēav	• ctkvËi wfiËK AvtjvPbvi gva`tg Z_` thvMvthvMi gjbxZ Dc`vcb </li> <li>• Z_` thvMvthvMi cμqv efb Ask cevn wPÎi mrvth` Dc`vcb tkYi KvR : • tgevBj tdvbi mrvth` Z_` mÂvj`bi avc mgn eK wPÎi mrvth` e`vL`v tkYi KvR: • gvBtμvdvb Ges w`úKvii kã Zi½ i cšc`i i e`vL`v tkYi KvR : • Zi½ A¼b Kti GbvjM I wWvRUvj msKZi cv_K` I mēavi e`vL`v </li> <li><b>tkYi KvR</b> • Z_` I thvMvthvM chw<sup>3</sup> wfvBR mēutK wky_v_xi AwfÁZv Dc`vcb  • eK wPÎi mrvth` Z_` I thvMvthvM chw³ wfvBtRi Kvμg I mēavi e`vL`v  <b>tkYi KvR:</b> • Z_` thvMvthvM wfvBRmgni gva`tg Z_` Av`vb c`vbi mēavi Zjbv	• mVKfvte eK wPÎ A¼b • avcmgni e`vL`vi mVKZv • Zi½ Askbi mVKZ\ • Dc`vcbvi cv_K` I e`envi i mēav Dc`vcbi mVKZv • welqe`i mVKZv	

wkLbdj	welqe	wkLb tklbvn wbt`kbv	gj`vqb wbt`kbv	wetkl tjlK wbt`kbv
7. B>Uvi#bU Ges B-tgB#ji Kvhµg e`vL`v Ki#Z cvi#e 8. Ab`vb` thvMv#hvM gva`#gi tP#q B>Uvi#bU Ges B- tgB#ji m#eavi Zjbn Ki#Z m¶g n#e </p> <p>9. thvMv#hvM m#ciKZ hšcwZ e`env#i d#j mó w#fb cKvi v` mgm`v Ges ciZKv#i tKškj eYbn Ki#Z cvi#e AbmÜvb 10. wk¶v_xi wB R GjvKvq mó v` mgm`v AbmÜvb Ki#Z cvi#e Av#eMxq 11. thvMv#hvM m#ciKZ hšcwZ mVK I KvhKi e`env#i m#PZb n#e I m#PZbZv m#ó Ki#Z cvi#e	• B>Uvi#bU Ges B-tgBj • Ab`vb` thvMv#hvM gva`#gi tP#q B>Uvi#bU I B-tgB#ji m#eav</p> <p>• v` mgm`v, ciZ#iva I ciZKv#i tKškj</p> <p>o `wó i ſu o kã `IY o w#KiY cfve	• B>Uvi#bU I B- tgB#ji aviYv c#k#Evi w#EK Av#jPbvi gva`#g Dc`vcb tkYi KvR : • Ab`vb` thvMv#hvM gva`g [tiwI, tUjwfb ,tdvb (j`vŮ I tgevBj) d`v · t#kb] Gi tP#q B>Uvi#bU I B- tgB#ji m#eav tcv`v#i Dc`vcb</p> <p><b>tkYi KvR :</b></p> <p>• `wó i ſu, kã `IY I w#KiY cfve w#tq wky_v_xi AwfÁZv `jxqf#e Dc`vcb </p> <p>• [tiwI, tUjwfb ,tdvb (j`vŮ I tgevBj) d`v · t#kb Ges K#úDUv#i e`env#i v` mgm`v Ges ciZ#ivtai tKškj Dc`vcb</p> <p><b>tkYi KvR :</b></p> <p>• thvMv#hvM m#ciKZ hšcwZ e`env#i d#j mó v` mgm`v ciZKv#i tKškj Dc`vcb </p> <p><b>e#oi KvR :</b></p> <p>• thvMv#hvM m#ciKZ hšcwZ mVK I KvhKi e`env#i m#PZb m#ó tKškjô eYbn	• welqe`i mVKZv </p> <p>• Dc`wcZ ciZKvi tKškj i mVKZv • Dc`wcZ m#PZbZv m#ó tKškj i h_v_Zv	• thvMv#hvM m#ciKZ hšcwZ e`env#i d#j mó v` mgm`v ciZ#ivtai t#iſ G, #jvi mVK e`envi I e`env#i t#iſ mZKZvi w#iY w`#Z w`#Z n#e

PZ`k Aa`vq : Rxb evPvZ weÁvb (16 weiqW)

weKldj	weiqe	weKlb tKlþbv weþ`kbv	gj`vqb weþ`kbv	weþkl tþjLK weþ`kbv
exexq 1. wePirKrmv weÁvþb tivM weYþq e`enZ weifb hšcwZþZ weÁvþbi ZË I aviYvi e`envi eYbv KiþZ cviþe 2. AvailBK chw³ Ges hšcwZ e`envþii dþj mó v̄ mgm̄v Ges cwZþivþai tKškj e`vL̄v KiþZ cviþe AvþeMxq 3. tivM weYþq weÁvþbi Ae`vbþK cksmv KiþZ cviþe	tivM weYþq e`eüZ hšcwZ <ul style="list-style-type: none"> <li>G· -ti</li> <li>AvēmþbMwd</li> <li>weU v̄v</li> <li>GgAviAvB</li> <li>BimR</li> <li>GþÜvmþKwic</li> <li>tivWI_iwc</li> <li>tKigI t_iic</li> <li>GbRlCwd</li> </ul> </li> <li>Dcþiv³ hšcwZ e`envþii dþj mó v̄ mgm̄v Ges cwZþivþai tKškj	- tivM weYþq e`enZ hšcwZ c`v̄ weÁvþbi th webg I ZË Dci ciZôZ Zvi e`vL̄v </li> </ul> <p><b>jMZ KvR:</b></p> <ul style="list-style-type: none"> <li>tKvb tKvb hšcwZ w`þq tKvb tKvb tivM weYq Kiv hvq Ges GB hš, þjv c`v̄ weÁvþbi th webgg cwPwjZ nq Zvi e`vL̄v QþK Dc`vcb </li> </ul> <ul style="list-style-type: none"> <li>wfiWI/Qrei mvrþh` AvailBK chw<sup>3</sup> Ges hšcwZ e`envþii dþj mó v̄ mgm̄v I cwZþivþai tKškj Dc`vcb Ges cþkvËiifËK AvþjvPbv ewoi KvR: - tivM weYþq weÁvþbi Ae`vb weIþq cwZþe`b cYqb	QþK Dc`wicZ Zþ`i mivKZv	- tivM weYþq e`enZ hšcwZi Kvþþg weÁvþbi th aviYv, ZË ev mî e`envi Kþi hšcwZ `Zþi nþqþQ Zv msiÿþ eYbv w`þZ nþe - hš th tivM weYþq e`envi Kiv nq Zvi weeiY Ges hš e`envþii KvþY mó v̄ mgm̄v I cwZþivþai tKškjmn Dc`vcb KiþZ nþe  hþši Qie w`þZ nþe - hþši Ae`vb th cksmvþq Zvi weeiY w`þZ nþe

11. † j LK w b ‡ ` w k K v

kÿvµg ic̣ilVq beg I `kg tkŕYi weÁvb welqUi Rb` 100 bai eivĭ ivLv n̄qtQ| mBvñn 3U Kti 2 eq̄ti tgU 216U wciqW eivĭ ivLv n̄qtQ| cZiU wciqWi e`wB 50ngBU |
weÁvb eltqi kÿvµtg κLbdj Ges weIqe¯ Ggbfvte cYqb Kiv n̄qtQ thb eivĭKZ 216 wciqW wκy_v_xiv me,tjv κLbdj ARb KiṽZ cv̇ti | weÁvb kÿvµg beg I `kg tkŕYi
gvbieK I e'emvq kÿv κvLi wκy_v_xṽi Rb` GKU AZvekKxq welq| GB wκy_v_xiv fwelṽZ māeZ weÁvb wκy_v Ksev weÁvb+K tckv wn̄mte MnY Kiṽe bv| ZiB weÁvbi mĭ I
ZṽEi ZmEK wekIY bv Kti mĭ I ZṽEi aviyv I e'envi+k ,izZ ṽlqv n̄qtQ Ges fm Abhvqx κLbdj tjLv n̄qtQ| ZvB weIqe¯ Dc-vcbvq weÁvbi mĭ, ZḂ I aviYvi e'envi Ges
Gṽi mvgnRK cfve I ,izZ+k māúKZ KiṽZ ntē|

weÁvb wkyvutg wkyv_x-tKb`K wKlb tKlvbv (Learner centred teaching learning) c×iZ mcwík Kiv n†q†Q| MZvbMwK gL⁻ Kivi ceYZv†K wbiærmvwiZ Kiv n†q†Q| ðwK wKL†Z n†e† Zvi crie†Z ðwKfvte wKL†Z n†e† Gi c†Z , i†Z Av†ivc Kiv n†q†Q|

weÁvb eBwU iPbv i mweav_ t j LK†` i ‡K wbaewYZ wb†`kbv_ t j v Abmi†Yi Ab†iva Kiv nj |

1. $c_{vmw^{1/2}KZv}$:

- ✓ $\llbracket ky_v _xiv \ hv \ \llbracket KL\ddot{e}, \ Zvi \ cvm\ddot{e} \ KZv \ thb \llbracket ky_v _xiv \ eS\ddot{Z} \ cv\ddot{i} \ Zv \ , \ i\ddot{z}m\ddot{N}Kv\ddot{i} \ we\ddot{e}Pb\ddot{v} \ Ki\ddot{Z} \ n\ddot{e} \rrbracket$
- ✓ $\llbracket KLb \ we\ddot{l}qU \llbracket ky_v _x\ddot{i} \ ^\wedge \ ^\wedge b \rrbracket \ ^\wedge b \ Rx\ddot{e}b \ A\ddot{w} \acute{A}Zvi \ m\ddot{v} _ \ m\ddot{a}u\ddot{K}h^3 \ Ki\ddot{Z} \ n\ddot{e} \rrbracket$
- ✓ $\llbracket ky_v _xi \ Pvi \ cv\ddot{k} \ ms\ddot{N}VZ \ we\ddot{f}b \ NUb\ddot{v} \ D^\wedge \ n\ddot{i}Y \ m\ddot{n}m\ddot{e} \ e^\wedge \ n\ddot{v}i \ Ki\ddot{Z} \ n\ddot{e} \rrbracket$

2. AvKIY :

- ✓ $\|kLb\|_{\ell^1} U Aek^B A \|KIY\|_q \text{ ev } A v b, \text{ ``} \|vqK\|_Z n\|_Z n\|_Z$
- ✓ $\|kLb\|_K Ggb \text{ f}^t \text{ v}^e Dc^{-} vcb \text{ Ki}\|_Z n\|_Z n\|_Z \text{ thb } Zv \|k\|_Y v \text{ x}^t \text{ ``} i \text{ g}^t b \text{ v}^t hM A \|KIY\|_K K\|_i \text{ Ges } Zv^t \text{ ``} i \text{ g}^t a \text{ } Drm \text{ v} n \text{ m}^i o \text{ } K\|_i \text{ } \|$

3. $h_v Z_v$:

- ✓ cV`veIq t j Lvi mgq Aek`B wky_x`i gvbwmK eq`mi (Mental Age) mv`\_ Dc`hvMx K`i w j L`Z n`e|
- ✓ we`fb g`bi (Different abilities) wky_x`i t kLvi m`hv`Mi c w Z j y i v L`Z n`e A\_vr wky\_x`i Rb` K w V`b`i we`fb `i i (Different level of difficulty) Dc`hvMx cV`\_yK`e|
- ✓ weIqe` m w VK n`Z n`e A\_vr Z`E, Z`\_, DcvE, wPÎ, Dcgv-D`vniY wbf j l m v w u w ZK n`Z n`e|

4. **Dc j^wä Kiv i Dc[†]h^wMZ^v :**

- ✓ $\|kL_b\|_{\ell_q} \cdot \|j_v Aek^B mnRfvte tevaMg^Dcvfq Pj\|_Z fvlvq m^{-u}o n^{\dagger}Z n^{\ddagger}e|$
- ✓ $\|ky_v_xi eqm Dc^{\dagger}hvMx mnR l mij fvlv e^{envi} Ki^{\ddagger}Z n^{\ddagger}e|$
- ✓ $\|kL_b\|_{\ell_q} \cdot \|j_v Aek^B h^w msMZ l tevaMg^Ab^{\dagger}Q^{\dagger}_{\hat{}} ef^3 n^{\ddagger}e| G^{\ddagger}\ddot{y}t^{\hat{}}\| kLbd^{\dagger}ji Pwn^{\vee}tK_i zmnKv^{\dagger}i vetePbv Ki^{\ddagger}Z n^{\ddagger}e|$

5. $wk\ddot{y}_v\mu g\ g''wU$ - :

GB Q†K Aaṽ†qi Rb̄ eiv̄İKZ ʷcʷiqʷ mSL̄v̄, ʷkLbdj, ʷelqē, Ges ʷkLbdjʷf̄ĖK ʷe†kl ʷb†`kbv †`lqv AṽQ hv fvj fv†e Dcjwä K†i ʷjL†Z n†el

- **ciZiU Aa`v`qi i`i#Z (c\_g cvZvq)** evg cv`k `wky`vµg Q`K D`j`LZ eixE`xq (AbmÜvbgjK/cixY`Y), g`b`v`c`kR I Av`teMxq tÿ`f`i `wKLbdj e`· i`tfZi tgvU **ni`d (Bold)** D`j`L Ki`Z n`te| Wvb cv`k `wky`v`x`i` cecvW/A`f`ÁZv Ges tPbvRvbw/Rxeb N`ibó D`vniY `w`tq 3-5 ev`K`i g`a` GKU f`igKv `tq gj cv`vi t`jLv i`i` Ki`Z n`te| `wky`v`x`i` ce A`f`ÁZv/welqe`- msikó c`ki gva`tg t`jLv i`i` Kiv ev`Äbxq|
 - `wky`vµg Q`K `wKLbdj eixE`xq (AbmÜvbgjK/cixY`Y), g`b`v`c`kR I Av`teMxq ciZiU Aa`v`qi Rb` chvqµ`tg D`j`L Kiv n`tq`Q| `wKš`welqe`- Dc`vcbv`i mgq eixE`xq`welqe`- msikó AbmÜvbgjK/cixY`Y, g`b`v`c`kR I Av`teMxq `wKLbdj Gi Dc`vcbv`i H eixE`xq`welqe`- Dc`vcbv`i mv`_mgšZ K`i Ki`Z n`te|
 - **ciZiU Aa`w`qi Rb` eiv`I tgvU `wciq`Wi 30 kZvsk mgq `wky`v`xi KgKv`ði (AbmÜvbgjK KvR/cixY`BZ`w`) Rb` eiv`I`_vK`te|** nv`Z Kj`tg KvRmn `wky`v`xi`wefb KgKv`ðK e· K`i `w`tZ n`te| c`thvR` tÿ`f`i Kv`Ri`w`b`kbv`I G`tZ`\_vK`te| cixY`Y/AbmÜvbgjK Kv`Ri` mgq [i`ciq`Wi msL`v] e`· D`j`L Ki`Z n`te| cixY`Y/AbmÜvbgjK KvRmg`n mnRj`f` Ges`_vbxqfv`te Kiv hvq Ggb DcK`iYi e`envi`K cva`b` `w`tZ n`te|
 - ciZiU Aa`v`qi c_g cõvi Wvb cv`k`welq msikó cva`b`kã (**Key word**) D`j`L Ki`Z n`te|
 - mKj tÿ`f`i SI BD`wU e`envi Ki`Z n`te|
 - cv`w`etePbv K`i eB`w`jLv ev`Äbxq| Aa`v`q D`j`LZ`wciq`W msL`v`K cv`w`msL`v`wetePbv Ki`Z n`te| tgvU cv`msL`v`Øviv`welqe`-`K Ggbfv`te`web`- (mnR t`_`K Kv`v`bi µg`bm`f`i) Ki`Z n`te`thb`H`wbaw`iZ`cv`w`msL`v`Øviv`H`Aa`v`q D`j`LZ`welqe`-i`cv`v`b`m`VKfv`te`m`óub`nq Ges`wKLbdj`A`w`RZ`nq| ciZiU Aa`v`q`wciq`Wi msL`v`Ges`Aa`v`q`Zw`EK/nv`Z`Kj`tg`/e`envi`K/AbmÜvbgjK Kv`Ri`Rb`c`q`Rbxq`wciq`W`wetePbv K`i Aa`v`qi cõv`msL`v`wbavi`Y Ki`Z n`te|
- wE`Áv`welqv`Ui eB`tg cõvi msL`v`n`te 180| Z`te 10% nvm ev`e`x`n`Z`cv`i`|**
- ciZiU cv`w`K Ggbfv`te`web`- Ki`Z n`te (**PÎ, Mvd, WwUv, MwYwZK e`v`L`v`BZ`w`\_`w`tq**)`thb`wky`v`\_`mRb`kxj,`m`óKxj Ges`wPšb`ÿgZv`eix`i`m`thv`M`cvq|
 - cv`vi`wefb`A`š`k`**ck/µqv`Kg/nv`Z`Kj`tg`KvR (Activities)** e· K`i `w`tZ n`te`hv`Abkxj`t`bi`gva`tg`wKLbdj`ARb`wb`ðZ`n`te| ciZiU Aa`v`q`wKQ`wKLbdj`Av`Q`hvi`Rb`welqe`-`t`lqv`nqib| Gme`tÿ`f`i`wKLbdj`AR`t`bi`Rb`KvR`w`tZ n`te`| D`PZI`wKL`t`bi` (**Higher Learning**)`Rb`c`t`Z`K`cv`VB`m`thv`M`iv`L`Z`n`te|`µqv`Kgmg`n`n`Z`cv`i`thgb`ciZ`te`b`^Zwi,`mvi`mst`ÿc`iPbv,`t`cv`÷`vi`^Zwi`Kiv,`WBs,`mgm`v`mgva`b,`nv`Z`Kj`tg`cixY`Y,`jMZ`Av`t`jv`Pbv,`wE`ZK`BZ`w`_`|`c`thvR` tÿ`f`i`MwYZ`mgm`vi`D`vniY`w`tZ n`te|
 - **welqe`-i`web`vm`I`Dc`vcbv`Ggbfv`te`Ki`Z`n`te`hv`Z`wky`v`xiv`Av`teMxq`tÿ`f`i`wKLbdj`ARb`Ki`Z`cv`i`|**
 - **evsjv`t`k`i`AwaKvsk`gva`w`gK`wE`v`j`tg`Dch`³`j`v`e`t`i`U`wi`t`bB|`Z`c`wi`wE`v`jqmg`t`ni`Aw`_K`Ae`v`m`šv`IRbK`bq|`wE`v`jqmg`t`ni`ev`e`Ae`v`wetePbv`q`ti`tL`nv`Z`Kj`tg`KvR`wWRvBb`Ki`Z`n`te|**
 - D`vniY/Qie`BZ`w`_`i`tÿ`f`i`tRÜvi`mgZvi`eRvq`iv`L`tZ`n`te|
 - MZv`bMwZK`avivq`gL`-`K`i`cixY`vq`c`w`Z`t`bevi`eZgvb`ceYZv`K`m`óYi`t`c`c`i`nvi`Kivi`j`tÿ`-`eB`tZ`mivm`wi`m`½v`^Zwi`K`i`t`lqv,`Q`K`cv`_K`\_`w`j`tL`t`lqv`wKsev`tKvb`c`ki`D`Ei`m`wR`tq`t`lqv`h`v`e`bv|`m`½v`gL`-`Kivi`c`w`ie`tZ`Dcgv`-D`vni`tYi`gva`v`tg`aviYv`AR`t`bi`e`e`v`\_vK`tZ`n`te|
 - ciZiU Aa`v`q`t`k`i`**Key Word`wfi`EK`GKU`mvi`mst`ÿc (Recapitulations)`\_vK`te|**

- cWZU Aa"vq tk#l chvB cWgY AbkxjbgjK Kvhμg W`tZ n#e| AbkxjbgjK Kvhμg PPvi gva"tg WkLb m`pKiY **(Reinforcement) n#e|** G,†jvi gta" _yKtZ cv†i-
 - ✓ kb"vb ciY
 - ✓ WgjKiY
 - ✓ Wefb ai†bi cvRj **(Puzzle)**
 - ✓ msWß ck
 - ✓ eûWbevPbxgjK ck
 - ✓ mRbkxj ck
 - ✓ Av†eMxq t†y†i WkLbdj AR†bi Rb" WKQ KgKvD
 - ✓ tgawe Wkyv_x†`i WKQ mWúmwiz KgKvD **(Extended Activity)**

Abkxjb Kvhμgmgn thb D"PZi `yZv (Higher order thinking) [thgb We†kiY, ms†kiY, Ges gj"vqb, mRbkxj WŠb (Creative thinking skill ) Ges m<sup>2</sup> WŠb `yZv (Critical thinking skill)] AWRZ nq Zv Aek"B WbWŠZ Ki†Z n#e|

- **GQvovI Wkyvμg Q†K WkLbdj WfWŠK mWbW`ó t†jLK Wb†`kbv t`lqv n†q†Q|**

Avqv†`i mWweK j†y" n"Q-

- GKWU gvb mWŠZ I AvKIYxq WeÁvb Wkyv_x†`i Dcnvi t`lqv
- WeÁvb Wkyv†K tciYvgjK I Avb>`vqK Kiv
- Wkyv_x†`i AbmWÜrmgbv I tKŠZnjx Kiv Ges WŠb ygZv mWúmwiz Kiv
- eB†K mLcvV", mnR†eva" Ges e"envh Kiv
- gL" Kiv ceYZv nvm Kiv Ges n†Z Kj†g tKlv†K DrmwWZ Kiv
- GKWU **Self Driven** cvV'eB iPbv Kiv thb Wkyv_xiv b†bZg mWvnh" Wb†q Wb†RivB WkLbdj ARb Ki†Z cv†i|

w kÿvµg

c`v_@Ávb

beg-`kg†kwY

1. f_{wgKv}

mf"Zvi iie t_KB chw³ weKv#ki th Aa"vq iie n#gq:Q Zvi mv#_ c`v\_weÁvbl I#Zv#cVZfvte RloZ| Aw`g h#M gvb| hLb cv_i N#l Av_b RvjvZ wKsev nwmZqvî Zwi KiZ
tmLv#bl wbrnZ vQj c`v\_weÁvbi avIYv| Avi eZgv#b A#j wPZ\_ I thvMv#hM chw<sup>3</sup> Zvl c`v_weÁvbiB M#elYv| dmj| ejv hvq, mf"Zvi iie t_K AvR chš Avgv#`i
cIzW`#bi Kv#Ri mv# Rlo#g Av#Q c`v_weÁvbl ZvB GKiesk kZiäxi P`v#jÄ tgvKv#ejvq Avgv#`i fweI`r cRb#K` Zwi Ki#Z c`v_weÁvbi Ávb jvf Kiv Qvov Zv mæe bq|

beg-`kg tkYi c`v_eÁvb wkÿvµg cYq#bi Ab`Zg D†İk`nj wkÿv_x`i Kms`vig³,eÁvbgb` I thŠ³K gvbI wnt#te Mto tZvjvI wkÿvµg cYq#b G welqUi Dci thgb
_iZ t`Iqv ntq#Q cikvcwk ev\_e Rxe#bi weifb Nubvi Av#jv#K c`v_eÁv#bi ZwEK w`K,tjv Av#jvPbv I nv#Z Kj#g KvR Kivi m#hWM iLvL ntq#QI GQov WPKrmv tÿ†İ
e`eüZ chw<sup>3</sup> m#ú#KI wkÿvµg aviYv t`Iqv ntq#QI Avkv Kiv hvq, wkÿv_xiv Gi gva#g c`v\_eÁv#bi AŞwb#nZ t#Ş`h Dc#fvM K#i Rxebe`vcx wkÿvq AvMnx nteI

gj`vqb »kLb c»µqvî GK»U Are†`Q`~ Ask-G tÿ†î Mv»bK gj`vq†bi c»kvc»k mvg»MK gj`vq†bi Dci tRvi t`lqv n†q†Q| c»W`c`K cYq†bi tÿ†î RxebN»bô D`vni†Yi gra†g
»elqe` Dc`vc†bi Rb` tJLK »b†`kbv c`vb Kiv n†q†Q| m†evc»i »kÿv_xi eqm l tgav »etePbv K†i cYxZ G »kÿvµg RvXq Avk» AvK»•ÿv ci†Y h†_ó f»gKv i»Lte etJ Avk»
Kiv hvq|

2. DṭĪk' :

1. c`v_ṽeÁṽḃi aṽiYv, cṽṽi DṭĪk' I cṽimi I iṽk mṽúṭK Rṽb Ges iṽki cKṽk I cṽigṽci ṭKškj AṽqĒ Kiv
2. MṽZ I ej mṽúṭK Áṽb ARb Kiv Ges Rṽeṭḃi bṽb ṭṽṭĪ Zṽ e`envi Kiv;
3. kṽ³ i i|cṽš i I ṽbṽšṭi i KṽhKṽiY Rṽb Ges Dbqb Kṽhṽṭg kṽ³ i KṽhKi e`envi mṽúṭK mṭPZb nIqv;
4. ṽeṽfb Aeṽṽq c`ṽṭ\_i Pṽc I eṭḃi ṽKq mṽúṭK Rṽb Ges Gṭ` i gṭa` mṽúK ṽcb Kiv;
5. c`ṽṭ_i ṽeṽfb Aeṽṽq Zṽc I ZṽcgvĪṽ mṽúṭK aṽiYv jṽf Kiv;
6. Zi½ I kṭāi ercĪĒMZ aṽiYv jṽf Kṭi ṽeṽfb ṭṽṭĪ Gṭ` i e`envi mṽúṭK mṭPZb nIqv;
7. ZṽĒK I e`enṽiK Áṽb ARb Kṭi ZṽoṭZi ṽbivc` I KṽhKi e`envi mṽúṭK mṭPZb nIqv;
8. Aṽjṽi cKṽZ, mĪ Ges ZĒ mṽúṭK Rṽb Ges Rṽeṭḃi bṽb ṭṽṭĪ Zṽ e`envi Kiv;
9. chṽ³ ṽeKṽṭk c`v\_ṽeÁṽḃi ṽbqṭgi KṽhKṽiZṽ Abaveb Kiv Ges Gi e`enṽiK , iZ Dc jṽä Kiv;
10. ṽeÁṽbK hšcṽZ e`envṭi i ṭKškj iḃ Kṭi e`ṽ³MZ ṽbivcĒṽ I hšcṽZ msiṽṽY mṭPó nIqv;
11. AṽaṽK c`v_ṽeÁṽḃi ZṽĒK I chṽ³MZ aṽiYv jṽf Kiv;
12. c`v\_ṽeÁṽb PPṽi gṽaṭḃ BṽZevPK `ṽófṽ½ Ges gj`ṭeva Mṭo ṭZṽjṽ|

3. Aa"vq web"vm I mgq eÈb

Aa"vqi µg	Aa"vqi bvg	¶ciqW msL"v	Aa"vqi µg	Aa"vqi bvg	¶ciqW msL"v
beg tkY			`kg tkY		
c_g Aa"vq	†f\$Z iwIk Ges ciigvc	15	beg Aa"vq	Av†jvi ciZmiY	15
¶Zxq Aa"vq	MiZ	14	`kg Aa"vq	¶i Ziior	12
ZZxq Aa"vq	ej	17	GKv`k Aa"vq	Pj Ziior	20
PZ_ Aa"vq	KvR, ygZv I ki³	14	Øv`k Aa"vq	Zio†Zi †P\$œK ¶µqv	8
cÂg Aa"vq	e¯i Dci Zv†ci cfve	20	Î†qv`k Aa"vq	AvavbK c`v_¶eÁvb I B†j±vb ·	14
Iô Aa"vq	c`v†_i Ae¯v I Pic	18	PZ`k Aa"vq	Rieb evPv†Z c`v_¶eÁvb	14
mßg Aa"vq	Zi½ I kã	14		†gvU	216
Aóg Aa"vq	Av†jvi ciZdjb	14			

4. $wk_y \mu g \text{ QK}$
 $c_v \text{ @ } \acute{A} vb$

c_g Aa`vq : †fšZ iw̄k Ges cwigvc (15 w̄ciqW)

w̄kLbdj	w̄elqe	w̄kLb †kL†bv w̄b†`kbv	gj`vqb w̄b†`kbv	w̄e†kI †jLK w̄b†`kbv
ēw̄x̄eĖxq 1. c`v_w̄eÁv†bi c̄imi I μḡieKvk e`vL`v Ki†Z cvi†e </p> <p>2. c`v_w̄eÁv†bi cv†Vi D†Īk` eYbv Ki†Z cvi†e </p> <p>3. `vb I Kv†ji aviYv e`vL`v Ki†Z cvi†e 4. †fšZ iw̄k [gvb Ges GKKmn] c`v_w̄eÁv†bi gjw̄f̄e e`vL`v Ki†Z cvi†e </p> <p>5. c̄igvc I GK†Ki c†qvRbxqZv e`vL`v Ki†Z cvi†e	- c`v_w̄eÁv†bi <ul style="list-style-type: none"> <li>c̄imi</li> <li>μḡieKvk</li> </ul> </li> <li>c`v_w̄eÁv†bi D†Īk` <ul style="list-style-type: none"> <li>cK̄iZi inm` D`NvUb</li> <li>cK̄iZi w̄bqg,†jv Rvbv</li> <li>cK̄iZi w̄bqg e`envi Kiv Ges ch̄i<sup>3</sup> i μḡieKvk `vb I Kv†ji Gi aviYv <ul style="list-style-type: none"> <li>BD̄KW</li> <li>M`w̄j†j I - w̄bDvU - w̄eÁv†bi w̄kyvi w̄f̄e- †fšZ iw̄ki gvb I GKK - c̄igv†ci GKK I c†qvRbxqZv	†fšZ RM†Zi bvbv NUbv I e`i mv†_ c̄iPq </li> <li>c`v_w̄eÁv†bi w̄efb aviYvi μḡieKvkI w̄bq†gi Aw̄e@v†i w̄eÁvbx†`i Ae`vb Bw̄Znv†mi `w̄ó†Z Dc`vcb - cK̄iZi w̄bqg,†jv Kxfv†e μgvMZ i`xZi i†c Aw̄e@Z n†q†Q D`vniYmn Av†jvPbv - w̄eÁv†bi c†qv†M ch̄i<sup>3</sup> i bvbv D`mve†bi `óvš Q̄ie mnKv†i Dc`vcb </li> <li>`jMZ KvR: ôc`v_w̄eÁv†bi cv†Vi c†qvRbxqZv e`vL`v </li> <li>e`i Ae`vb I NUbvi gnZ `vb I Kv†ji aviYvi e`envi `óvš mnKv†i Dc`vcb		

c_g Aa'vq : †fšZ iwk Ges cwigvc (15 wciqW)

Pjgvb-2

ⓂkLbdj	Ⓜelqe	ⓂkLb-†kL†bv Ⓜb†`kbv	gj`vqb Ⓜb†`kbv	Ⓜe†k††jLK Ⓜb†`kbv
6. †gšjK iwk Ges jä iwiki cv_K" e"vL"v Ki†Z cvi†e 7. cwigv†ci AvšRwZK GKK e"vL"v Ki†Z cvi†e 8. iwiki gv†v wnmve Ki†Z cvi†e 9. GK†Ki Dcm†Mi (Ⓜcid ·) ,wYZK I Dc,wYZ†Ki (Multiple and Submultiple) i†cvš†i i wnmve Ki†Z cvi†e 10. ^eÁwBK cii fvlv, cZxK Ges wPý e"envi K†i c`v_ⓂeÁv†bi aviYv Ges ZĖ†K cKvk Ki†Z cvi†e </p> <p>11. hšcwZ e"envi K†i †fšZiwk cwigvc Ki†Z cvi†e </p> <p>12. cwigv†c h_v_Zv, wbfjZv I m²gvb eRvq ivLv††Kškj e"vL"v Ki†Z cvi†e </p> <p>13. mij hšcwZ e"envi K†i e¯i †y†dj I AvqZb wbyq Ki†Z cvi†e </p> <p>14. ^`b`b Rxe†b e"eüZ e¯ mvgMxi %`N`,fi, †y†dj I AvqZb wbyq Ki†Z cvi†e </p> <p>g†bv†c†kR</p> <p>15. cwigv†c mij hšcwZi mwVK e"envi c`kb Ki†Z cvi†e Av†eMxq 16. cwigv†c h_v_Zv, wbfjZv I m²gvb eRvq ivLvq m†PZb n†e	• †gšjK iwk Ges jä iwk Ges G†`i GKK • cwigv†ci AvšRwZK GKK • iwiki gv†v • Use of Prefix (Multiple and Submultiple) • Use of Standard form/scientific notation • cwigv†ci hšcwZ - o e"vjvY - o _vgv Nw - o wgv†††j - o fwbqv†††j - o ¯ MR • cwigv†c †wU (Error) • cwigv†c h_v_Zv, wbfjZv I m²gvb eRvq ivLv††Kškj			

W0Zxq Aa`vq : MvZ (14 WcwiqW)

WkLbdj	Welqe	WkLb-tkL#bv Wb`kbv	gj`vqb Wb`kbv	We`kl t jLK Wb`kbv
ewxeExq 1. WvZ Ges MvZ e`vL`v KiZ cvi`te </p> <p>2. Wefb cKvi MvZi gta` cv_K` KiZ cvi`te 3. t`jvi Ges t f±i iwk e`vL`v KiZ cvi`te 4. MvZ mawKZ iwkmgtni gta` cvi`úik mawK We`kIY KiZ cvi`te 5. evavxb I g³ fvte coš e`i MvZ e`vL`v KiZ cvi`te	- WvZ Ges MvZ - Wefb cKvi MvZ : ^iLK MvZ - NbYMvZ - Pjb MvZ - chveEMvZ - ú`b MvZ</li> </ul> </li> <li>t`jvi I t f±i iwk - MvZ msikó iwk Ges Gt`i MvYvZK mawK <ul style="list-style-type: none"> <li>`iZ I miY `Z, Mo `Z - teM, Mo teM I AvtcvYK teM - ZiY, mlg ZiY I g`b</li> </ul> </li> <li>g<sup>3</sup> fvte coš e`i MvZ : AfKIR ZiY	`jMZ KvR:</b> WvZ I MvZ Wel`q WkYv_xi AfÁZv Dc`vcb</li> <li>c`kvEiWfEK AvjvPbvi gva`tg e`e D`vniY e`envi Kti WvZ I MvZ Dc`vcb</li> <li><b>GKK KvR:</b> t`vjvvi MvZ, mvBtKtji MvZ, cv_exi MvZ, MvQ nZ Avg cov, tXD tKvbU tKvb cKviti MvZ KvYmn WvYvZKiY `jMZ KvR</b> fWgKvfbtqi gva`tg Wefb cKvi MvZ c`kb</li> <li><b>GKK KvR :</b> fi, kv<sup>3</sup>, miY, g`b, mgq, ZibtK t`jvi I t f±i iwk Wntmte WvYvZKiY</li> <li>MvZ msikó mij MvYvZK mawK Dc`vcb I D`vniYi mvinth` eL`v</li> <li>mij MvYvZK mawK e`envi Kti MvZ msikó iwiki Wmve I mgm`vi mgvavb</li> <li><b>GKK KvR I ewoi KvR</b> mij MvYvZK mawK e`envi Kti MvZ msikó iwiki Wmve I mgm`vi mgvavb [WkYv_x tkvYtZ Ges ewotZ MvZ msikó iwiki Wmve I mgm`vi mgvavb Ki`te]	- MvZi `eikó` WvYvZKiYi Ges c`kbi mVVKZv </li> <li>t`jvi I t f±i iwk WvYvZKiYi mVVKZv - dgjvi mVVK e`envi </li> <li>iwkmgn#K mVVK GKtK cKvk </li> <li>c`hvR` tYt` gZvgZi mVVKZv	- MvZi mgxKiY cvZcv`bi c`qvRb tbB - iwkmgti cvi`úik mij MvYvZK mawK Ges Zvt`i cwigv t`LvZ nte

wkLbdj	welqe	wkLb-†kL†bv wb†`kbv	gj`vqb wb†`kbv	we†kl †jLK wb†`kbv																					
6. †jLwP††i mvrn†h" MIZ mǎúKZ iwkmg†ni g†a" mǎúK (gvb, cKwZ, Ae`vb) we†kIY Ki†Z cvi†e </p> <p>7. GKwU Xvj Z³vi Dc†i gv†ej Mwo†q co†Z w`†q `iZ I mg†qi g†a" mǎúK wbaviY Ki†Z cvi†e </p> <p>8. wkÿv_xiv 100 wguvi †`šo ciZ†hwMZvq AskMnY K†i wb†R†`i `wZ wbYq Ges †jLwP††i Zv we†kIY Ki†Z cvi†e g†bv†cwkR 9. †`šo ciZ†hwMZvq mgq I `iZ mwVKfv†e wbYq Ki†Z cvi†e Av†eMxq 10. Avgv†`i Rxe†b MwZi cfve Dcjwǎ Ki†Z cvi†e	†jLwP††i mvrn†h" MIZ we†kIY - mgq-`iZ †jLwP† - mgq - teM †jLwP†	- c†kvÊiwfiÊK Av†jvPbvi gva†g †jLwP††i mvrn†h" MIZ mǎúKZ iwkmg†n Dc`vcb</li><li><b>GKK KwR :</b> w`i MIZ†Z Pjgvb e`i we†fb mg†q AwZKwš `iZ †`qv nj  <table><tr><td>t</td><td>2†m</td><td>4†m</td><td>6†m</td><td>8†m</td><td>10†m</td><td>12†m</td></tr><tr><td>s</td><td>4</td><td>6†g</td><td>8†g</td><td>10†g</td><td>12</td><td>14 †g</td></tr><tr><td></td><td>†g</td><td></td><td></td><td></td><td>†g</td><td></td></tr></table>   - AwZmwš `iZ e`envi K†i †jLwP† A†b Ges †jLwP† n†Z e`i Ae`vb wbYq Ges Ae`v†bi Zjbv`wZ mgq †jLwP† A†b K†i ZiY wbYq        <b>`jMZ KwR: AbmÜvbgjK KwR/cixÿY<ul style="list-style-type: none">GKwU Xvj Z³vi Dc†i we†fb f†ii †MwvKwZ e`†K Mwo†q co†Z w`†q `iZ I mg†qi g†a" mǎúK wbaviY    100 wguvi †`šo ciZ†hwMZvq AskMnY K†i wkÿv_xi `wZ wbYq Ges †jLwP††i Zv we†kIY        <b>ewoi KwR:</b> ÔAvgv†`i Rxe†b MwZi cfveÔ Gi eYbv	t	2†m	4†m	6†m	8†m	10†m	12†m	s	4	6†g	8†g	10†g	12	14 †g		†g				†g		†jLwP† A†b†bi mwVKZv - iwk†i Ae`vb wbY†qi mwVKZv </li><li>h_vh_c††mqv AbmiY </li><li>_vgv Nio Ges wguvi M†R†i mwVK e`envi - mwVKfv†e Z_` msMn </li><li>mǎúK `vcb Ges Gi e`vL`v	WwUv e`envi K†i †jLwP† n†Z Kxfv†e `wZ, ZiY †ei Ki†Z nq Zv †`Lv†Z n†e </li><li>bZb ciw`wZ†Z GKB †jLwP††i mvrn†h" GKwaK e`i MIZ we†kl†Yi m†hwM_vK†Z n†e
t	2†m	4†m	6†m	8†m	10†m	12†m																			
s	4	6†g	8†g	10†g	12	14 †g																			
	†g				†g																				

ZZxq Aa`vq : ej (17 wciqW)

wkLbdj	welqe	wkLb-†kL†bv wb†`kbv	gj`vqb wb†`kbv	wet†kl †jLK wb†`kbv
ewxēxq 1. e⁻i RoZv I et†ji ,YMZ aviYv wbDU†bi M†Zi c_g m†îi e`envi K†i e`vL`v Ki†Z cvi†e </p> <p>2. tgš†jK et†ji cK†Z e`vL`v Ki†Z cvi†e </p> <p>3. mvg`Zv I mvg`Zvienxb et†ji cfve e`vL`v Ki†Z cvi†e </p> <p>4. fi†eM Ges msNI e`vL`v Ki†Z cvi†e 5. M†Zi Dci et†ji cfve wet†kIY Ki†Z cvi†e	- RoZv Ges et†ji ,YMZ aviYv- wbDU†bi c_g m†î - tgš†jK et†ji cK†Z : o gnv†I ej o Z†orP†K†xq ej o `ej wbDK†xq ej o mej wbDK†xq ej</li> <li>mvg`Zv I mvg`Zvienxb ej (Balanced & Unbalanced Forces) - fi†eM Ges msNI - M†Zi Dci et†ji cfve	<p>`jMZ KvR</b> KviYmn e`vL`v</p> <ul style="list-style-type: none"> <li>S††K †`†j Kvco/†cv†K n†Z ajv cov - Pjš †Ub n†Z ej wb††c Ki†j Zv wb††cKvixi nv†Z G†m cov - c†††PZ D`vniY †`†q tgš†jK et†ji e`vL`v <p>GKK KvR</p> - mvg`Zv I mvg`Zvienxb et†ji aviYvi Av†jv†K e`vL`v o †X†Ki m†v†h` avb f†bv o `B `††j†i g†a` ††o U†bvU†bi †Ljv <p>ewoi KvR</p> - Kx N†U Ges †Kb N†U o Qv` †_†K e`†K †Q†o †`†j		- wbDU†bi m†îi msÁv Ges we`wiZ eYbv †`evi c†qvRb †bB - ev`e Ges P†icv†k msN†UZ N†U†vi m†_ wbDU†bi m†îi aviY†K m†o†KZ Ki†Z n†e

ZZxq Aa`vq : ej (17 wciqW)

Pj gvb-2

wkLbdj	welqe	wkLb-†kL†bv wb†`kbv	gj`vqb wb†`kbv	w†kl†jLK wb†`kbv
6. wDU†bi MZi wZxq mî e`envi K†i ej cigvc Ki†Z cvi†e </p> <p>7. wDU†bi MZi ZZxq mî e`envi K†i wµqv I cwiµqv ej e`vL`v Ki†Z cvi†e 8. wivc` âg†Y MZ Ges e†ji cfve w†kIY Ki†Z cvi†e </p> <p>9. w†fb cKvi NIY Ges NI†Yi ej e`vL`v Ki†Z cvi†e </p> <p>10. e`i MZi Dci NI†Yi cfve w†kIY Ki†Z cvi†e 11. NIY nvm eix Kivi Dcvq e`vL`v Ki†Z cvi†e 12. Avg†`i Rxe†b NI†Yi BwZevPK cfve w†kIY Ki†Z cvi†e	- ej Ges Zi†Yi mœUK- wDU†bi wZxq mî - wµqv I cwiµqv ej- wDU†bi ZZxq mî - wivc` âgY : MZ I ej    - NIY     - AveZ NIY (Rolling Friction)    - wCQjv†bv NIY (Sliding Friction)    - cevn NIY (Fluid Friction)    - NI†Yi ej (Force of Friction)          - MZi Dci NI†Yi cfve     - Uvqv†i i cō    - iv`vi gmYZv - MZ w†bqSY Ges teiKs ej - NI†Yi nvm eix (Increasing and Decreasing Friction) - NIY : - GKwU Acwiinvh Ag½j (Friction: A necessary Evil) NI†Yi m†eav	- ej c†qv†M ZiY N†U†Kb Zv w†fb D`vniY w`†q e`vL`v `jMZ KvR</b>: wZxq m†îi m†v†h` e`vL`v ŌGKwU Dc†i i w`†K w†b†y†B e` Dc†i D†V Ges w†b†P G†m c†oŌ cix†Y (`jMZ KvR)</b>: mnR cix†y†Yi m†v†h` ej cigvc `jMZ KvR</b> <ul style="list-style-type: none"> <li>Lv†U†Kvqv Ae`vq wµqv cwiµqv e`vL`v - Mwoi MZ nVvr eix†c†j hv†x†Kv†b w`†K†n†j covi Kv†Y e`vL`v</li> </ul> </li> <li><b>`jMZ KvR - NI†Yi cKvi I Kv†Y e`vL`v - Mwoi PvKv I iv`v</li> <li>miz cvB†c cwi†bi cevn</li> <li>i³ bvj†Z i³ cevn</li> <li>`B nv†Zi Zv†ji NIY		

ZZxq Aa`vq : ej (17 wciqW)

Pjgvb-4

wkLbdj	welqe	wkLb-†kL†bv w†`kbv	gj`vqb w†`kbv	w†kl†jLK w†`kbv
cixŷv 13. mnR cixŷ†Yi mnnv†h ej ciigvc Ki†Z cvi†e g†bv†c†kR 14. cixŷY Kv†Ri DcKiY I hšcwZ m†VKfve e`envi Ki†Z cvi†e </p> <p>15. w†bivc` âgY m†ú†K m†PZbZv ^Z†i i j†ŷ`†cv÷vi A†¼b I c`kb Ki†Z cvi†e Av†eM†xq 16. Avgv†`i R†e†b w†efb cKvi e†ji cfve Dc†j†â Ki†Z cvi†e </p> <p>17. w†bivc` âgY w†b†ðZKi†Y bvM†i†Ki`w†qZ I KZe` m†ú†K m†PZb n†e I Ab††`i m†PZb Ki†e				

PZ_ Aa`vq : KvR, ygZv I k³

(14 wciqW)

wkLbdj	welqe	wkLb-†kL†bv wb†`kbv	gj`vqb wb†`kbv	w†kl†jLK wb†`kbv
eixeE`xq</b></p> <p>1. KvR I k<sup>3</sup> i mǎúK e`vL`v Ki†Z cvi†e </p> <p>2. MǎZ k<sup>3</sup> I w`vZk³ e`vL`v Ki†Z cvi†e Ges wnmve Ki†Z cvi†e 3. Dr†m k³ i i cvšī e`vL`v Ki†Z cvi†e 4. A_wbZK, mvgwRK I cwi†ekMZ cfve w†e†Pbvq k³ i cavb Drmmg†ni Ae`vb w†eklY Ki†Z cvi†e	• KvR I k<sup>3</sup> • MǎZ k<sup>3</sup> I w`vZ k³ Ges G†`i MwiYiZK wnmve • k<sup>3</sup> i cavb Drm Ges k<sup>3</sup> i i cvšī - o ivmvqwbK/Rvjwb k<sup>3</sup> - o Rjw`r (hwšK k³ i i cvšī) - o †mšī k³ - o wbdKxq k³ - o evq k³ - o f Zvcxq k³ - o ev†qvym k³	• w†fb cKvi D`vni†Yi mwnv†h` Kv†Ri aviYv e`vL`v • Kv†Ri aviYv n†Z k³ i e`vL`v Ges G†`i mǎúK </li> <li>• <b>GKK KvR:</b> KvR I k<sup>3</sup> i aviYv n†Z e`vL`v <ul style="list-style-type: none"> <li>o GKwU cv_i†K Dc†i D†E`vjb Ki†j - o GKwU w`ús†K †U†b j†v Ki†j</li> </ul> </li> <li>• w`ó f†i GKwU e`†K w`ó D`PZv n†Z f†g†Z c†ZZ c†_m†ev`P, g†eZx I f†g†K w`úk Ae`vq MǎZk³ I w`vZ k<sup>3</sup> i Ae`vi MwiYiZK e`vL`v • MwiYiZK m†, MǎZ k³ I w`vZ k<sup>3</sup> i e`envi K†i wnmve • GKK KvR : k³ i i cvšī e`vL`v m†B†Kj Pvjv†bv, KvV c†o†q ivbv, MxUvi evRv†bv, †mvjvi c`v†bj		• wbdU†bi 2q m† I gnvKI m††i aviYv e`envi K†i MǎZ k³ I w`vZk<sup>3</sup> aviYv i†i Ki†e • k<sup>3</sup> i cavb Dr†m Kx†v†e k<sup>3</sup> i i cvš†i†i gva`tg k³ Drcw`Z nq Zv eYbv Ki†Z n†e hšcwZ ev cix†v c†x†Z †`L†bv†i c†qvRb †bB </li> <li>• msÁv bv w`†q D`vni†Yi mwnv†h` MǎZ k<sup>3</sup> Ges w`vZ k³ i aviYv w`†Z n†e • MǎZk<sup>3</sup> Ges w`vZ k³ i MwiYiZK dgjv c†Zcv`b Kivi c†qvRb †bB †a k<sup>3</sup> c†igv†ci Rb` MwiYiZK dgjv eYbv Ki†Z n†e </li> </ul> <p>3 bs wkLbd†ji welqe` Ggb†v†e Dc`vcb Ki†Z n†e †hb 4bs wkLbdj A†RZ nq  4bs wkLbdj Activity</p> <p>w†m†e cW`c`†K †`lqv †h†Z cvi†i </p>

PZ_ Aa'vq : KvR, ygZv I k³

(14 wciqW)

Pjgvb-2

wkLbdj	welqe	wkLb-ikL+bv wbt`kbv	gj`vqb wbt`kbv	wetkl f jLK wbt`kbv
5. k³ i i cvši Ges k³ i wBZ'Zvi gta" maúK e'vL'v KiZ cvi e 6. k³ i i cvši I Gi e'envi th ciite ki fvimv' e'vnZ K+i Zv e'vL'v KiZ cvi e 7. Av ciyKZvi wetkl ZÉ Abmv i fi k³ i maúK e'vL'v KiZ cvi e 8. KvR, ej Ges mi Yi gta" maúK vcb KiZ cvi e 9. Dbqb Kv µtg k³ i Kv Ki e'envi e'vL'v KiZ cvi e AbmÜvb 10. wky_v_x AbmÜvb wmo te q Dc+i DV e [t`šo w`q/tntU] Ges wbtR+i ygZvi Zjbv KiZ cvi e g bv ciKR 11. KvR I k³ ci igv ci DcKiY I hšcwZ m VKfv e e'envi KiZ cvi e Av eMxq 12. k³ i Kv Ki I w bivc` e'env i m PZb n e	• k³ i i cvši Ges k³ i wBZ'Zv ev msiyYKxjZvi bxiZ • k³ i i cvši, e'envi Ges ciite ki Dci cfve • fi I k³ i maúK • KvR Ges Kv Ri wnmve • Dbqb Ges k³ i Kv Ki e'envi (K l, wky_v, v~)	• k³ i wBZ'Zvi bxiZ e'vL'v • k³ i wBZ'Zvi bxiZi Av jv K k³ i i cvši i maúK e'vL'v GKK KvR: k³ i wBZ'Zvi bxiZi Av jv K k³ i i cvši e'vL'v mvB Kj Pvjv bv, KW ci o q ivbv, MxUvi evRv bv, fmvjvi c`v bj </p> <ul style="list-style-type: none"> <li>• fi I k<sup>3</sup> i maúK e'vL'v</li> <li>• m  e'envi K+i fi I k<sup>3</sup> i i cvši i wnmve </li> <li>• KvR, ej Ges mi Yi maúK e'vL'v </li> </ul> <p><b>GKK KvR:</b> ej, KvR I mi Yi wnmve </p> <p><b>ewoi KvR:</b> K l, wky_v I v~ e'e`vi Dbqb k³ i e'envi AbmÜvbgjK KvR (`jMZ KvR)</b></p> <p><b>wky_v_x` i ygZv wYq Ges Zjbv Kv Ri aviv • wky_v_xi fi ci igv c • `iz ci igv c • mgq ci igv c dgjv e'envi K+i wky_v_xi ygZv wYq I Zjbv		

cÂg Aa`vq : e<sup>-</sup>i Dci Zv`ci cfve (20 wcvigW)

wkLbd j	welqe ⁻	wkLb-`kL`bv wbt`kbv	gj`vqb wbt`kbv	wetkl t jLK wbt`kbv
e⁻x eËxq 1. Zvc I ZvcgvÎv e⁻vL`v Ki`Z cvi`e </li> <li>2. c`v`_i ZvcgwÎK ag e<sup>-</sup>vL`v Ki`Z cvi`e 3. dv`ibnvBU, tmjwqvm Ges tKjwfb t`f`j i gta<sup>-</sup> maúK wetkIY Ki`Z cvi`e </li> <li>4. e<sup>-</sup>i ZvcgvÎv e<sup>-</sup>x (e<sup>-</sup>i Af`šixY kw³ e⁻x i mv`c`ÿ) e⁻vL`v Ki`Z cvi`e </li> <li>5. c`v`_i Zvcxq cmviY e<sup>-</sup>vL`v Ki`Z cvi`e 6. KvVb c`v`_i ^`N`, tÿÎdj Ges AvqZb maúmviY e⁻vL`v Ki`Z cvi`e </li> <li>7. Zi`j i AvcvZ Ges ckZ cmviY e⁻vL`v Ki`Z cvi`e </li> <li>8. c`v`_i Ae<sup>-</sup>vi cwieZ`b Zv`ci cfve e<sup>-</sup>vL`v Ki`Z cvi`e	• Zvc I ZvcgvÎv • c`v`_i ZvcgwÎK ag • dv`ibnvBU, tmjwqvm Ges tKjwfb t`f`j i gta<sup>-</sup> maúK</li> <li>• e<sup>-</sup>i ZvcgvÎv e<sup>-</sup>x</li> <li>• c`v`_i Zvcxq cmviY</li> <li>• KvVb c`v`_i ^`N`, tÿÎdj Ges AvqZb maúmviY</li> <li>• Zi`j i AvcvZ Ges ckZ cmviY • c`v`_i Ae⁻vi cwieZ`b Zv`ci cfve	<p>`jMZ KvR :</p> <ul style="list-style-type: none"> <li>• mgcwigvY cw b I tZ`j Aí Zvc c`qM Ki`j cw b I tZ`j i th ZvcgvÎvi cv_K<sup>-</sup> nq Zv e<sup>-</sup>vL`v Ki`Z nte </li> <li>• cvi`, Gj`Kvj BZ`w` c`v`_i MjbvK I ùUbvK D`jL K`i c`v`_i ZvcgwÎK ag e<sup>-</sup>vL`v Ki`Z nte </li> <li>• dv`ibnvBU, tmjwqvm Ges tKjwfb t`f`j i wngvK I ùUbvK e⁻te hvPvB K`i t`j, t`jvi cvi`úik maúK wbyq • GKK KvR : GK Kvc cwbi ZvcgvÎv th tKvb t`f`j cwigv K`i Zv MwYvZK fvte Ab`vb` t`f`j i ZvcgvÎvq i cvi Ki`e • e⁻e D`vniY thgb, <ul style="list-style-type: none"> <li>o tij jvB`bi dvK - o Mig cwbtZ ci: KvPi Mm tdtU hvIqv	• `jxq KvR tkl tgšLK ck K`i	• KvVb c`v`_i wetfb cKvi maúmvi`Yi mij MwYvZK maúK t`LvZ nte • Zij c`v`_i wetfb cKvi maúmvi`Yi mij MwYvZK maúK t`LvZ nte

cÂg Aa'vq : e⁻i Dci Zv#ci cfve

(20 wciqW)

Pjgyb-3

«kLbd j	«elqe	«kLb-†kL†bv «b†`kbv	gj`vqb «b†`kbv	«e†kl †jLK «b†`kbv
9. Mjb, ev@úxfeb I Nbxfeb e`vL`v Ki†Z cvi†e	• Mjb, ev@úxfeb I Nbxfeb	o Kv†Pi ^eqv†g avZe «Qic AvUwK†q hvIqv BZ`w` NUbvi gva†g c`v†_i mßúmviY e`vL`v Ki†Z n†e		• «erfb dgjv e`envi K†i MwYwZK mgm`vi «KQ D`vniY w`†Z n†e
10. MjbvsK I ùUbvsK e`vL`v Ki†Z cvi†e	• MjbvsK I ùUbvsK	• e`e D`vni†Yi mvnv†h` Mjb, ev@úxfeb I Nbxfeb eYbv		
11. Mjbvs†Ki Dci Pv†ci cfve e`vL`v Ki†Z cvi†e	• Mjbvs†Ki Dci Pv†ci cfve	• `jxq KvR : o cixÿ†Yi mvnv†h` MjbvsK I ùUbvsK «bYq		• cvZ`wnK Rxe†b msNwVZ I e`enviKZ Zvcxq mßúmvi†Yi «KQ Rbwq NUbv D`vniY w†m†e I «KQ Activity w†m†e cv`c`†K w`†Z n†e
12. ùUb I ev@úvqb e`vL`v Ki†Z cvi†e	• ùUb I ev@úvqb	• Pv†c eid Lð †Rvov †j†M hvIqv c`k†bi gva†g Mjbvs†Ki Ici Pv†ci cfve e`vL`v		
13. Mjb Ges ev@úxfe†bi mßZvc e`vL`v Ki†Z cvi†e	• Mjb Ges ev@úxfe†bi mßZvc	• D`vni†Yi mvnv†h` ùUb I ev@úvqb e`vL`v		
14. ev@úvqb kxZjxKi†Yi KviY e`vL`v Ki†Z cvi†e [Explain that evaporation causes cooling]	• ev@úvqb kxZjxKi†Yi KviY	• `jxq KvR : mnR cixÿ†Yi mvnv†h` o eid Mj†bi mß Zvc «bYq o cwi†bi ev@úxfe†bi mßZvc «bYq		
15. ev@úvq†bi Dci «bqv†Ki cfve e`vL`v Ki†Z cvi†e	• ev@úvq†bi Dci «bqv†Ki cfve	• Mi†gi mgq cvLvi e`envi, ewj Kjwm†Z cwb Vðv Kiv BZ`w` D`vni†Yi gva†g ev@úvqb kxZjxKi†Yi KviY e`vL`v		
16. Av†c«ÿK Zvc I Zvc aviY ÿgZv e`vL`v Ki†Z cvi†e	• Av†c«ÿK Zvc I Zvc aviY ÿgZv			
17. Zvc ciigv†ci gjbxZ e`vL`v Ki†Z cvi†e	• Zvc ciigv†ci gjbxZ			

cÂg Aa`vq : e⁻i Dci Zv⁺ci cfve (20 wciqW)

Pjgvb-4

wkLbdj	welqe⁻	wkLb-†kL†bv wbt⁻kbv	gj`vqb wbt⁻kbv	wetkI †jLK wbt⁻kbv
cixÿv 18. ei†di MjbvSK wbyq Ges ZvcgvÎv-mgq †jLwP†Î Dc⁻vcb Ki†Z cvi†e 19. cwbi ùUbvSK wbyq Ges ZvcgvÎv-mgq †jLwP†Î Dc⁻vcb Ki†Z cvi†e g†bv†c†kR 20. cixÿY Kv†Ri DcKiY I hšcwZ mVKfv†e e⁻envi Ki†Z cvi†e Av†eMxq 21. w†fb c⁻v†_i w†fb w†fb MjbvSK Ges ùUbvSK Kxfv†e cK†Z I Rxe†bi Rb⁻AbKj cw†ek ^Z†i K†i†Q Dcj†ä Ki†Z cvi†e Ges c⁻v†_i Ggb AvPi†Yi cksmv Ki†e		- D⁻niYmn Av†ciÿK Zvc I Zvc aviY ÿgZv Av†jvPbv - Dò I kZj e⁻i ms⁻ú†k Zv†ci Av⁻vb c⁻v†bi NUbv e⁻vL⁻vi gra†g Zvc cw†gv†ci gjb⁻†Z e⁻vL⁻v - cK†Z†Z w†fb c⁻v†_i MjbvSK Ges ùUbvSK h⁻GKB nZ Z†e Kx ai†Yi cw†ek ^Z†i nZ †m m†ú†K wky⁻v_x†`i g†bv†ve c†Zdj b m†ú†KZ GK†U †cv÷vi c⁻kb		

I ô Aa`vq : c`v`_i Ae⁻ I Pvc (18 wciqW)

wkLbdj	welqe	wkLb-†kL†bv wbt`kbv	gj`vqb wbt`kbv	we†kl †jLK wbt`kbv
eixE`xq</b></p> <p>1. c`v`_i AvYieK Mz ZĖ (Kinetic Molecular Theory) e`vL`v Ki†Z cvi†e </p> <p>2. c`v`_i c†Rgv Ae<sup>-</sup> e`vL`v Ki†Z cvi†e </p> <p>3. c†Z`mK Rxe†bi we†fb NUbvq ej I †ŷ†d†j c†ieZ†bi m†_ P†ci c†ieZb e`vL`v Ki†e 4. NbZ e`vL`v Ki†Z cvi†e 5. ^`b`b Rxe†b Nb†Zi e`envi e`vL`v Ki†Z cvi†e </p> <p>6. evqgÊ†j i Pvc e`vL`v Ki†Z cvi†e </p> <p>7. Zij ††i D`PZv e`envi K†i evqgÊ†j Pvc c†igvc Ki†Z cvi†e	- Mz c`v`_i AvYieK ZĖ - c†Rgv Ae<sup>-</sup> - ej I †ŷ†d†j m†_ m†úK (†`Iq†j wcb XKv†bv, KvM†R Avjwcb XKv†bv, BZ`w`) </li> <li>NbZ <ul style="list-style-type: none"> <li>o ^`b`b Rxe†b Nb†Zi e`envi - evqgÊ†j i Pvc - o evqgŮ†j i Pvc c†igvc	- c`v`_i AYi cZxK wmv†e wKQ iOb m†i lvi `vbv weKv†i i c†ib†Z w`†q b†ov w`†q G†`i Mz ch†eŷY - Zvck<sup>3</sup> MnY K†i c`v`_i cigvY †_†K B†j KUb m†i wM†q GKwU bZb Ae<sup>-</sup> c†w†B Z_v c†Rgv Ae<sup>-</sup> e`vL`v Ki†eb - GKB †jvK gwU†Z (I) `wo†q _vKv (II) gv_vq f†i tevS†mn `wo†q _vKvi †ŷ†† A_ev, H e`v`3 i K) `vov†bv L) †`šov†bv M) kwqZ _vKvi g†a` †Kvb †ŷ†† gwUi Dci P†ci a†b (Kg/†e†k) e`vL`v Ki†e </li> <li>`jMZ KvR : mgvb AvqZ†bi c†wb I †Zj Gi g†a` †Kvbw†i fi Kg/ †e†k Zv †R†b GKK AvqZ†bi fi Z_v NbZ e`vL`v KiY  <ul style="list-style-type: none"> <li>A†U†g†evBj hš c†i†w††i Rb` †K†i†w†b Ges NIY	†gšLK c†ki g†a`†g </li> <li>wkŷv_xi Abaveb I M†Y†ZK Ac††i kb Kivi `ŷZv hvPvB†qi g†a`†g </li> <li>D`vniY c†qvM Kivi `ŷZv hvPvB Gi g†a`†g	

Iô Aa`vq : c`v`\_i Ae`v I Pvc

(18 wciqW)

Pjgvb-3

wkLbdj	welqe	wkLb-†kL†bv wb†`kbv	gj`vqb wb†`kbv	wekl† j LK wb†`kbv
8. D"PZv ei×i mv†_ evqgÊ†ji P†ci cieZb we†kiY Ki†Z cvi†e 9. Avenlqvi Ici evqgÊjxq P†ci cieZb we†kiY Ki†Z cvi†e 10. w`i Zi†ji g†a` †Kvb we`†Z Pvc cigvc Ki†Z cvi†e </p> <p>11. Zi†j wbgv¾Z e`i EaÿgLx P†ci AbfiZ e`vL`v Ki†Z cvi†e 12. e` †Kb cw†b†Z fv†m Zv e`vL`v Ki†Z cvi†e </p> <p>13. evsjv†`†k tbš c†_ `NUbvi KviY we†kiY Ki†Z cvi†e	• fc†ôi D"PZv Ges evqgÊ†ji P†ci cieZb • evqgÊjxq P†ci cieZb Ges Avenlqvi cieZb • w`i Zi†j g†a` †Kvb we`†Z Pvc</li> <li>• cevxi Pvc I ceZv</li> <li>• e` cw†b†Z fv†m- Av†Kv†W†mi bx†Z	• Kgyevi Rb` MxR Gi g†a` Nb†Zi ZviZg`_vKvi KviY e`enwiK †ÿ†Î e`vL`vKiY • (6+8) nvjKv M`vncY tejb †Q†o w`†q tejb†U Dc†i D†V †d†U hv†qvi KviY †_†K evq gÜ†ji Pvc e`vL`vKiY • (7+9) e`v†i wguv†i cvi`_††i D"PZv cigvc K†i P = hpgmgxKi†Yi mnvqZv wb†q wkÿv_xiv evqgÊjxq Pvc cigvc Ki†e ††Kvb Kvi†Y †Kvb w`bi evq nvjKv n†q Dc†i D†V †M†j Pvc K†g hv†q  evqi kb`Zv ci†Yi Rb` c†keZx w`bi evq `†Z†e†M Av†m hv Øviv S†oi cevfm cv†qv hv†q </li> <li>• b`x ev cK†ii Mfxi R†j mvZvi KvUvi mgq wb†R†K nvjKv g†b nq wKbv Zvi Dci w†f†E K†i wkÿv_x Zi†ji EaÿgLx Pvc e`vL`v Ki†e • (12+13) w†agLx ej (IRb) I EaÿgLx ej (ceZv) Gi ZviZ†g`i n†me K†i e`i f†mb I wbg¾†bi KviY e`vL`v Ki†e Ges EaÿgLx e†ji w†fikxjZv (b`x I mg†`i cw†bi NbZ) we†ePbv K†i tbš-`NUbvi KviY we†kiY Ki†e	• wb`³i mnv†h` e`†K evq†Z I cw†b†Z †i†L IRb cigvcKi†Yi gva†g	• 2 bs Aa`vq wkÿv_xiv we†fb cKvi ej Ges M†Zi Ici e†ji cfve wk†L†Q  G Aa`v†qi 14 bs wkLbdj Ges 2 bs Aa`vq Av†Z Ávb n†Z wkÿv_x 15 bs wkLbdj ARb Ki†e  15 bs wkLbdj Abmv†i Activity cvW`c`†K †`†qv ††Z cv†i

wkLbdj	welqe	wkLb-†kL†bv wb†`kbv	gj`vqb wb†`kbv	wetkl †jLK wb†`kbv
14. c`vm†K†ji mî e`vL`v Ki†Z cvi†e </p> <p>15. c`vmK†ji mîi e`enwiK wµqv c`kb Ki†Z cvi†e 16. cxob, weKwZ e`vL`v Ki†Z cvi†e 17. n†Ki mî e`vL`v Ki†Z cvi†e cixv: 18. wefb AvKv†i i KvVb e`i NbZ wbYq Ki†Z cvi†e </p> <p><b>gbv†cikR</b></p> <p>19. NbË wbY†q e`enZ DcKiY I hšcwZ mVKfv†e e`envi Ki†Z cvi†e </p> <p><b>Av†eMxq</b></p> <p>20. Avgv†`i Rxe†b AwKvgWm I c`vm†K†ji mîi Ae`vb cksmv Ki†Z cvi†e	- c`vm†K†ji mî- <ul style="list-style-type: none"> <li>o eje†×KiY bwZ</li> <li>o Gi e`envi - cxob I weKwZ e`vL`v Ki†Z cvi†e - û†Ki mî e`vL`v Ki†Z cvi†e	nvB†Wwjk R`v†Ki mvnv†h` ej e†×i w†l†q aviYv c`vb </li> <li>ej c†qv†M iev†i i b†ji cmviY I ej Acmv†iYi gva†g b†ji ms†KvPb Gi mvnv†h` cxob, weKwZi e`vL`vKiY	Pvc msµvš w†l†q weÁvb†`i Ae`vb wkÿv_xi wbKU †_†K keY K†i	

mßg Aa`vq : Zi½ I kã (14 wciqW)

wKlbdj	welqe	wKlb-†KL†bv wb†`kbv	gj`vqb wb†`kbv	wetkl †jLK wb†`kbv
eixEëq 1. Zi½i wKó" e`vL`v Ki†Z cvi†e 2. Zi½ msikó iwkmgtñi g†a" mij MmYiZK mǎúK `vcb Ges cwigvc Ki†Z cvi†e </p> <p>3. kã Zi½i wKó" e`vL`v Ki†Z cvi†e </p> <p>4. ciZaYib mǎó e`vL`v Ki†Z cvi†e </p> <p>5. `b`b Rxe†b ciZaYibi e`envi e`vL`v Ki†Z cvi†e 6. k†ãi teM, KǎúvK Ges Zi½`†N`i MmYiZK mǎúK n†Z iwkmgn cwigvc Ki†Z cvi†e 7. k†ãi teM cieZb e`vL`v Ki†Z cvi†e 8. kve`Zv mǎgv e`vL`v Ki†Z cvi†e </p> <p>9. k†ãi kve`Zvi mǎgv I G†`i e`envi e`vL`v Ki†Z cvi†e	• Zi½i cKvi†f` Ges wKó"</li> <li>• Zi½ msikó iwK Ges MmYiZK mǎúK</li> <li>• kã Zi½</li> <li>• ciZaYib mǎó</li> <li>• ciZaYibi e`envi • k†ãi teM, KǎúvK Ges Zi½`†N`i MmYiZK mǎúK • k†ãi te†Mi cieZb (gva`g, Zvcgîv)</li> <li>• kve`Zvi mǎgv I k†ãi e`envi	• e`e D`vniY thgb, cK†i wXj †Qvovi ci mó †XD, b`xi †XD BZ`w`i gva`g Zi½ mǎúK aviYv c`vb K†i Zi½i wKó" mǎúK Av†jvPbv </li> <li>• `jMZ KvR : • iwK I Zvi w`†q `Zvi w`ús Gi gva`g Zi½ mǎó Ki†e mó `B ai†bi Zi½ ch†eYy Ki†e Ges G†`i g†a" cv`†K" Dc`vcb K†i Zi½i cKvi wPiyZ Ki†e • `jMZ Kv†R wK†K c†qvRbxq mǎvqZv Ki†e Ges Zi½i wKó" eYbv Ki†e </li> <li>• kvš b`x†Z Ges b`x†Z jÂ Pjgvb Ae`vq b`xi cv†o AvQ†o civ †XD Gi M†Z†e†Mi D`vniY I te†w Av†Z Zi½i msikó wfb iwK I G†`i MmYiZK mǎúK Dc`vcb Ki†e • wfb gva`g k†ãi te†Mi D`vni†Yi (thgb tijjvB†b Kv†b cvZ†j `†i †U†bi kã îbv, cwb†Z w`†q kã îbv BZ`w`) mǎv†h" k†ãi te†Mi cieZb e`vL`v Ki†Z n†e Ges kie`Zvmxgv cxP I ZxYv e`vL`v Ki†Z n†e </li> <li>• ch†eYy †WK wjó e`envi K†i w`v††q†i Av†k cv†ki k†ãi Drm wPiyZ K†i kã `†Yi c†ve AbmYg	• `jMZ Kv†Ri gva`g Ges wfb MmYiZK mǎv†v mǎv†bi gva`g</li> <li>• D`vniY e`envi K†i k†ãi Dr†mi wPiyZ Ki†Z n†e </li> <li>• wP†i mǎv†h" evZ†m kã Zi½ c†v†ni †Kškj c`k†bi gva`g kã Zi½i wKó" e`vL`v Ki†Z n†e </li> <li>• wK†v`x†`i ciZaYib îbv†i Av†ÁZv †R†b ciZwqv e`vL`v Ki†Z n†e</li> <li>• `jMZ Kv†Ri gva`g `b`b Rxe†b (thgb, K†ci M†xiZv wbyq, mǎ†`i M†xiZv wbyq BZ`w`)	

mßg Aa`vq : Zi½ I kã (14 ¶c¶iqW)

Pjgvb-3

¶kLbdj	¶elqe	¶kLb-¶kL¶bv ¶b¶`kbv				gj`vqb ¶b¶`kbv	¶e¶kI ¶jLK ¶b¶`kbv
10. kãai cxP I ZxyZv e`vL`v Ki¶Z cvi¶e 11. kã`I¶Yi KvY I djvdj Ges c¶Z¶i¶ai ¶K¶kj e`vL`v Ki¶Z cvi¶e	- cxP I ZxeZv - kã `IY - c¶Z¶i¶ai ¶K¶kj	kãai Drm		kã y¶ZKi		c¶Z¶b¶a e`en¶i i              ¶y¶, ¶jv ¶P¶yZ              Ki¶Z n¶e </li> <li>GKKfv¶e ¶eifb              M¶Y¶ZK mgm`v mgvavb Ki¶Z n¶e	
				n`v	bv		
		1.	M¶oi nY				
		2.	g¶B¶K M¶b				
		3.	¶i¶W I ¶Z M¶b e¶Rbv em ¶÷ kb				
		4.					
		5.					

Aóg Aa'vq : Av+jvi cıZdj b (14 wciqW)

wLbdj	welqe	wLb-†KL†bv wb†`kbv	gj`vqb wb†`kbv	w†kl †jLK wb†`kbv
eıxēĖxq - Av+jvi cKıZ e'vL'v Ki†Z cvi†e - Av+jvi cıZdj†bi mĭ e'vL'v Ki†Z cvi†e `cY e'vL'v Ki†Z cvi†e </li> <li>cıZıeā e'vL'v Ki†Z cvi†e </li> <li>Av+jvK iıK†i wıq†iLv A½b K†i `c†Y Av+jvi cıZıeā e'vL'v Ki†Z cvi†e - mgZj ††Mvjxq `c†Y cıZıeā mıóı wKQ mvaviY NUbv e'vL'v Ki†Z cvi†e </li> <li>`c†Yi e'envi e'vL'v Ki†Z cvi†e cıxŷv - cıZıeā mıó c`kb Ki†Z cvi†e </li> </ol> <p><b>Av†eMıxq</b></p> <ol style="list-style-type: none"> <li>Av†ııi Rıe†b wıfb Av†jıKıxq NUbı cfve Ges G†ıi Ae`vb Dcjıä Ki†Z cvi†e Ges cksmv Ki†Z cvi†e	- Av+jvi cKıZ - Av+jvi cıZdj†bi mĭ `cY- mgZj ††Mvjxq ( AeZj, DĖj)</li> <li>cıZıeā -e'v'e † Ae'v'e</li> <li>`c†Y Av+jvi cıZıeā - mgZj ††Mvjxq `c†Y cıZıeā mıóı wKQ mvaviY NUbv</li> <li>`c†Yi e'envi - wıbıvc` WıBıfs</li> <li>cıvıwıo iv`vi A`k` eıvK/cıeZ" mo†K wıec`¾bK eıvK [(Blind turns on Hilly Roads)] - wıeab	- K'vjK†jUi, UPjıvBU, m†hi Av+jvi D`vııY wı`†q Av+jvi cKıZ e'vL'v Ki†Z n†e `jMZ Kı†Rı gıvı†g Av+jvi <b>mıj †ıLvq MgY, Av†jıv Kıı³ wı†m†e KıR K†i † Av†jıv eıvq kb` c†_ P†j Gi D`vııY Dc`vcb - wıkŷv_xı AskMı†Y Avqıv † Avjıcb cıxŷY c`kb K†i Ges wPĭ G†K Av+jvi cıZdj b mĭ e'vL'v Ki†Z n†e </li> <li>D`vıı†Yı mıvı†h` `c†Yı e'vL'v wı`†Z n†e </li> <li>mıe n†j e'v'e mgZj ††Mvjxq `cY e'envi K†i `cY † GZ`msıvŠ iıwık e'vL'v Ki†Z n†e `c†Y Av+jvi wıqıv †ıLv A½†bi †KŠkj e'vL'v Ki†Z n†e </li> <li>GKK KıR wı†m†e DĖj † AZj `c†Yı †dvKı†mı eıvB†ı Ges wıfZ†ı Ae'vZ e`ı cıZıe†ıı Ae`vb † AvKıı wıbYq `jMZ KıR : e'v†e †Kııv †Kııv †ŷ†ı mgZj `cY † DĖj `cY e'envi Kııv nq KııYmn Zıv wıPıyZKıY </li> </ul> <p>Bıı½Z : †Wıms †Uıe†j Mııııı cıvı `cY BZ`wı`</p>	`jMZ Kı†Rı dıvıdj hıPıB - GKK Kı†Rı dıvıdj hıPıB	

beg Aa`vq : Av+jvi cZmib (15 vciqW)

⚭kLbdj	⚭elqe	⚭kLb-†kL#bv ⚭b†`kbv	gj`vqb ⚭b†`kbv	⚭e†kl †jLK ⚭b†`kbv
e⚭xēĖq 1. Av+jvi cZmi†Yi mĭ e`vL`v Ki†Z cvi†e 2. cZmi†Yi e`vL`v Ki†Z cvi†e 3. cY Af`ŠixY cZdjbe`vL`v Ki†Z cvi†e </p> <p>4. AcUk`vj dVBe†ii e`envi e`vL`v Ki†Z cvi†e </p> <p>5. ^`b`b Rxe†b Av+jvi cZmi†Yi e`envi e`vL`v Ki†Z cvi†e 6. †j†Yi cKvi†f` e`vL`v Ki†Z cvi†e	• Av+jvi cZmi†Yi mĭ • cZmi†Yi • μwš †KvY I cY Af`ŠixY cZdjbe</li> <li>• AcUk`vj dVBevi • †Uij KlgD†b†Kkb Ges v` †Y†Ĭ Gi e`envi • Av+jvi cZmi†Yi e`envi</li> <li>• †jY Ges †j†Yi cKvi†f`	• GKK KvR cWbi I ci GKU Av+jvK iik† jafv†e cZZ nj Ges Av†iK†U iik† Av†j†ai m†_45 W†M †Kv†Y cZZ nj G†`i cZmi†Z iik†, †jv AsKb </li> <li>• <b>GKK KvR</b> GKU †ek cZmi†vK ⚭ekó gva`†gi †fZi †_†K Av+jvK iik† Kg cZmi†vK ⚭ekó gva`†g c†ek Ki j   Av+jvK iik† †Kv†`†K te†K hv†e Zvi †PĬ AsKb cZdjZ iik†i †KvY gv† μwš †KvY? • Pkgv, †Uij†`c, gv†μv†`c Av+jvi cZmi†Yi b†Zi e`envi e`vL`v		

beg Aa`vq : Av`jvi cWZmib (15 WciqW)

Pjgvb-2

WKLbdj	Welqe	WKLb-`KL`bv Wb`kbv	gj`vqb Wb`kbv	We`kl t`jLK Wb`kbv
7. Av`jvK iWki Wμq`iLv A½b K`i t`jY msμvš Wefb iWk eYbv Ki`Z cvi`te 8. t`jY mÓ cWZieA Av`jvK iWki Wμq`iLv A½b K`i eYbv Ki`Z cvi`te 9. t`jYi ygZv e`vL`v Ki`Z cvi`te </p> <p>10. Av`jvK iWki Wμq`iLv A½b K`i t`PvLi Wμq` e`vL`v Ki`Z cvi`te 11. Wó `k`Yi WbKUZg We` e`vL`v Ki`Z cvi`te </p> <p>12. Wó i WU e`vL`v Ki`Z cvi`te </p> <p>13. Av`jvK iWki Wμq`iLv A½b K`i Wó i WU mskva`b t`jYi e`envi e`vL`v Ki`Z cvi`te </p> <p>14. i½b e`i Av`jvKxq DcjWä e`vL`v Ki`Z cvi`te	- t`jY msμvš iWk <ul style="list-style-type: none"> <li>t`dvKvm `iZ</li> <li>j`ye`i `iZ - cWZie`ai `iZ - t`jY cWZieA mÓ</li> <li>t`jYi ygZv - t`PvLi Wμq` - Wó `k`Yi WbKUZg We`</li> <li>Wó i WU</li> <li>Wó i WU mskva`b Ges t`jYi e`envi - i½xb e`i Av`jvKxq DcjWä (Perceptions of coloured objects)	- GKU DĚj t`jY e`envi K`i j`ye`i Wefb Ae`v`bi Rb` j`ye`i `iZ, t`dvKvm `iZ I cWZie`ai `iZ e`vL`v </li> <li>`jMZ KvR (ciX`Y): GKU DĚj t`jYi t`dvKvm `iZ WbYq Ges Gi e`vL`v - t`PvL GKU t`jY Ges Gi Dc`hWb Kv`hμ`gi e`vL`v </li> <li>YXY Wó I `xN Wó mÓi KvY Ges t`jY e`envi K`i G, t`jv mskva`bi e`vL`v </li> <li>i½b e` t`Lvi t`Y` t`PvLi iW I t`Kvb Gi KvR e`vL`v		

WkLbdj	Welqe	WkLb-†kL†bv Wb†`kbv	gj`vqb Wb†`kbv	Wetkl †jLK Wb†`kbv
cixv 15. †jY e`envi K†i cWZiea mWó c`kb Ki†Z cvi†e 16. Welfb eq†mi `Wóí îWU mWúb gvb†li yxY I `iZ cWigvc K†i Zv†`i Rb` mWve` †jY e`env†ii mcWwik Ki†Z cvi†e Av†eMxq 17. ^`bW`b KvWµ†gi Ges M†elYvi †y†î †j†Yi Ae`vb†K cksmv Ki†e		• cixY (`jMZ KvR):</b> GKWU DĖj †j†Y jY`e`i Welfb Ae`v†bi Rb` cWZiea mWó c`kb I Ges Gi e`vL`v • AbmÜvbgjK KvR (`jMZ KvR):</b> Ô`iZ cWigvc K†i îWU WPyZKiY I †jY WbevPb ygZv WbevPbô Kv†Ri Wb†`kbv</b> <ul style="list-style-type: none"> <li>o Pkgv e`envi K†ib Ggb Welfb eq†mi 8 Rb bvix ci†l WbevPb - o Pkgv Qvov WbevPZ bvix ci†li e`k†Yi b`bZg `iĖ cWigvc </li> <li>o `i†Ė Ici WfWĖ K†i `Wóí îWU kbv³KiY Ges †j†Yi cKwZ WbevPb </li> <li>o GKWU cWZ†e`b cYqb ewoi KvR: Ô`bW`b KvWµg Ges M†elYvi †y†î †j†Yi Ae`vbô D`vniYmn e`vL`v		

$$\text{`kg Aa"vq} : \text{w}^{-i} \text{Zwor} \quad (12 \text{wc}^i \text{iqW})$$

wkLbdj	welqe	wkLb-†kl†bv wɓ†`kbv	gj`vqb wɓ†`kbv	wetkl †jLK wɓ†`kbv
eṽxeĒxq				
1. cigvY MV†bi wfiĒ†Z w̄i Zlor mīó tgšJJK KvIY eʻvLʻv Ki†Z cvi†e	• w̄i Zlor mīó- o NIY cμqvq o Av†ek cμqvq	• D`vniYmn NIY I Av†ek cμqvq w̄i Zlor mīó cigvYi MV†bi wfĒ†Z eʻvLʻv		
2. NIY I Av†ek cμqvq w̄i Zlor mīó eʻvLʻv Ki†Z cvi†e		• cixŸY (`jMZ KvR)</b> : w̄i Zlor mīó c`kY Ges eʻvLʻv		
3. ZiorexŸY h†ši mnv†h PVR kbv³KiY Ki†Z cvi†e	• PVR kbv³KiY- ZiorexŸY h†ši eʻenvi			
4. Kj†ai mî eʻenvi K†i ^e`wZK ej cigvc Ki†Z cvi†e	• Zlor etji cigvc-Kj†ai mî	• `jMZ KvR: Kj†ai Zlor etji m†Î †Kvb †Kvb iwK RtoZ Ges G†`i Ici Zlor ej Kxf†e wbfikxZvi eYbv Ges weifb †ÿ†Î etji wnve		
5. Zlor ej†iLvī gra†g Zlor tÿ†Îi cvej` I Gi w`K eʻvLʻv Ki†Z cvi†e	• Zlor ej†iLvī gra†g Zlor tÿ†Îi cvej` I Gi w`K eʻvLʻv	• GKK KvR : Zlor ej†iLv AsKb o GKU abvZ!K PVR I GKU FYvZ!K PVR o `BvU abvZ!K PVR		
		• GKK KvR : ôej†iLvī gra†g Zlor tÿ†Îi ZxeZv Ges w`K eʻvLʻvô		

`kg Aa"vq : w̄i Zwor

(12 wciqW)

Pjgvb-2

ⵓⵎⵏⵓⵢⵉⵙ	ⵓⵎⵏⵓⵢⵉⵙ	ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ	ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ	ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ
6. ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ 7. ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ 8. ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ 9. ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ 10. ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ 11. ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ	- ⵓⵎⵏⵓⵢⵉⵙ - ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ - ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ - ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ	- ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ - ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ - ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ: ⵓⵎⵏⵓⵢⵉⵙ ⵓⵎⵏⵓⵢⵉⵙ		

GKv`k Aa`vq : Pj Zlor (20 wciqW)

wKldj	welqe	wKlb-fKLbvb wbt`kbv	gj`vqb wbt`kbv	we`kl tjlK wbt`kbv
e`xeE`xq 1. w`i Zlor nZ Pj Zlor mío c`kb KiZ cvi`e </p> <p>2. Zlor ce`fni w`K Ges Btj`b ce`fni w`K e`vL`v KiZ cvi`e </p> <p>3. Zlor hš I DcKiYi cZxK e`envi Kti eZbx A`b KiZ cvi`e	- w`i Zlor nZ Pj Zlor mío</li> <li>Zlor ce`fni w`K Ges Btj`b ce`fni w`K - Zlor cZxK : [mBP (GKgLx, w`gLx), tKvI, e`vUwi, w`i tiva, cieZbkxj tiva, Zlor Drm (Gim Ges wWim), wDDR, tjw A`wgUvi, tfv`egUvi, M`vj fv`bwgUvi, f ms`hvM, AvovAwio Zvi, tCPv`bv Zvi ,avik]	jMZ KvR: w`i Zlor I Pj ZiOZi wel`q wky`xi AfÁZv `jxqfv`e Dc`vcb - eZbx AsKb Kti w`i Zlor nZ Pj Zlor mío c`wμqv e`vL`v jMZ KvR: eZbx ^Zii Kti w`i Zlor nZ Pj Zlor mío c`kb (DcKiY: `v I Zvgvi cvZ, e`vUwi, jN mvj`dDiiK GimW/ tje, cieevnx Zvi, mBP, M`vj fv`bwgUvi/A`wigUvi/UP evj) - eZbx AsKb Kti Zlor ce`fni w`K Ges Btj`b ce`fni w`K e`vL`v </li> <li><b>GKK KvR:</b> Zlor ce`fni w`K Kxfv`e Btj`b ce`fni w`K nZ Avjv`v eZbx AsKb Kti Dc`vcb </li> <li>cZxK AsKb Kti Zlor hš I DcKiY ciwPZKiY (GKRb Btj`b`kq`bi m`vnt`h` Zlor hš I DcKiY c`kb Kiv thZ cvi`i  )</li> <li><b>GKK KvR:</b> Zlor hš I DcKiYi cZxK e`envi Kti eZbx A`b	eZbx ms`hv`Mi m`VKZv </li> <li>eZbxZ Zlor ce`fni Dc`wZ </li> <li>welqe`i m`VKZv </li> <li>eZbx AsK`b e`eüZ cZx`Ki m`VKZv	

wkLbdj	welqe	wkLb-tkLtbv wb`kbv	gj`vqb wb`kbv	wetkl tjlK wb`kbv
4. cievnx, Acievnx Ges Aacievnx c`v_e`vL`v KiZ cvite	cievnx, Acievnx Ges Aacievnx	ciiPZ D`vniY e`envi Kti cievnx, Acievnx Ges Aacievnx c`vt_i e`vL`v</li> <li><b>GKK KvR</b> : GKU QK tkY Kti Af`sti Ae`Z wfb c`v_tK cievnx I Acievnx c`vt_ KviYmn wPyZKiY	mVK e`vL`v mnKti cievnx I Acievnx wPyZKiY	
5. tjLpPti mnvth` Zlor cevn Ges wefe cv_K` Gi gta` mUK`vcb KiZ cvite	wefe cv_K` Ges Zlor cevni gta` mUK-Intgi mî	jMZ KvR: wefe cv_K` Ges Zlor cevn welq ky`v_xi AfÁZv`jxqfve Dc`vcb - eZbx AsKb Kti wefe cv_K` Ges Zlor cevni gta` mUKi e`vL`v, MwYvZK mUK`vcb Ges Zlor cevn, wefe cv_K` wYq ewoi KvR : wefe cv_K` I Zlor cevni nmve I tjLpPti Dc`vcb Kti wefe cv_K` I Zlor cevni mUK wYq	mVKfve tjLpPti A`b </li> <li>c`E Z` e`envi Kti wefe cv_K` I Zlor cevni mUK wYq</li> <li>wefe cv_K` I Zlor cevni nmve	
6. w`i tiva Ges cieZbkxj tiva e`vL`v KiZ cvite	w`i Ges cieZbkxj tiva	- wefe cv_K` I Zlor cevni tjLpPti e`envi Kti tivtai e`vL`v - w`i I cieZbkxj tivtai e`vL`v		

wkLbdj	welqe	wkLb-†kL†bv w†`kbv	gj`vqb w†`kbv	w†k††jLK w†`kbv
7. ZlorPvjK ej Ges wefe cv_K` e`vL`v Ki†Z cvi†e	ZlorPvjK ej Ges wefe cv_K`	- eZbx Askb K†i ZlorPvjK ej Ges wefe cv_†K`i wμqv† Ae`vb, aviYvi e`vL`v GKK KvR :ôZlorPvjK ej n†`Q KviY Ges wefe cv_`K` n†`Q djô e`vL`v	welqe`i m†VKZv	
8. †iv†ai wbfikxjZv e`vL`v Ki†Z cvi†e	†iv†ai wbfikxjZv : - o `^N` - o c`†`Q†`i †y†dj</li> <li>o Zvcgv†v</li> <li>o Dcv`vb			
9. †ivaKZv I c†iew†nZv e`vL`v Ki†Z cvi†e	†ivaKZv I c†iew†nZv	†k†Y Ges mgvŠivj eZbx ^Z†i i †KŠkj Ges evmv ew†o†Z G†`i e`env†i i e`vL`v		
10. †k†Y I mgvŠivj eZbx e`envi Ki†Z cvi†e	†k†Y Ges mgvŠivj eZbx ^Z†i i e`envi	`jMZ KvR: †k†Y Ges mgvŠivj eZbx ^Z†i i Ges c`kb	eZbx†Z †k†Y I mgvŠivj m†hv†Mi m†VKZv	
11. eZbx†Z Zj`†iva e`envi Ki†Z cvi†e	Zj`†iva Ges eZbx†Z Zj`†iv†ai e`envi	Zj`†iva ^Z†i i †KŠkj Ges eZbx†Z G,†jvi e`envi I Gi e`vL`v		

wkLbdj	welqe	wkLb-tkLtbv wb`kbv	gj`vqb wb`kbv	wetkl tjlK wb`kbv
12. Zlor ygZvi wnmve KiZ cviZe 13. ZloZi wmt÷g jm Ges tjjw tkWs e`vL`v KiZ cviZe 14. ZloZi wbiyc` I KvHKi e`envi eYbv KiZ cviZe cixÿ 15. eimv ewoiZ e`envi Dc`hvMx eZbx i bKkv cYqb Kti Gim Drtm Gi e`envi c`kb KiZ cviZe gbv`cikR</b></p> <p>16. Zlor kv<sup>3</sup> i AcPq tiva I msiÿtY mPZbZv mío i Rb` tcv÷vi A¼b KiZ cviZe AvteMxq 17. ZloZi wbiyc` I KvHKi e`envi mPZbZv mío KiZ cviZe	• Zlor ygZvi wnmve • ZloZi wmt÷g jm Ges tjjw tkWs • ZloZi wbiyc` I KvHKi e`envi • eimv ewoi Dc`hvMx Zlor eZbx i bKkv cYqb Ges e`envi c`kb	• Zlor ygZvi wnmve wby`qi wbgg e`vL`v </li> <li>• <b>GKK KvR:</b> wfb wfb wUv e`envi Kti Zlor ygZvi wnmveKiY • GKK KvR: wbiyc` Zlor e`envi K ai`bi mveavbZv Aeja b KiZ nq GKU ZwjKv `Zi KiZe • cixÿY (`jMZ KvR) :</b> wkÿv_xiv eZbx i bKkv AsKb KiZe, eZbx `Zi KiZe Ges tjjw e`envi i (GKwaK evj) Kti Gim Drm e`envi Kti eZbx i h_v_Zv c`kb KiZe </li> <li>• <b>ewoi KvR Ges we`vj`qi KvR:</b> Zlor kv³ i AcPq tiva I msiÿtY mPZbZv mío i Rb` tcv÷vi AsKb Ges mPZbZv mío i Rb` we`vj`q/GjvKvq i`wji AvtqvRb	• mVKfv`e Zlor ygZvi wnmve </li> <li>• ZwjKv `Zi i mVKZv • eZbx`Z DcKiY mshv`Mi mVKZv • eZbx i KvKwiZv • tcv÷vi AsKbi mVKZv • tcv÷v`i welqe`i ciZdjb • avivewnk chteÿtYi gva`tg wkÿv_xi mPZbZv gj`vqb	

Øv`k Aa`vq : Zwo`Zi tPšak wμqv

(8 wciqW)

wkLbdj	welqe	wkLb-†kL†bv wb†`kbv	gj`vqb wb†`kbv	wetkl †jLK wb†`kbv
ewxexq				
1. Zlor cevni tPšak wμqv e`vL`v Ki†Z cvi†e	• cviewn†Z Zlor cevni Kvi†Y tPšak cfve	• we``rewnx Zv†ii wbK†U PaK kjvKvi wet†yc c`kb	• (1+2) `jMZ : cix†Y mPvi†i†c mœúb KiY hvPvB†qi gva`†g	
2. Zlor PaKxq Av†ek e`vL`v Ki†Z cvi†e	• Zlor PaKxq Av†ek	• M`v jfv†bvigUvi h <sup>3</sup> m†jb†q†Wi wbK†U Ziorewnx K†jx wKav `†PpaK Avbv t†lqv K†i ZiorePaK Av†ek wμqv c`kb Ki†e		
3. Aweó Zlor cevn Ges Aweó wefe cv_K` e`vL`v Ki†Z cvi†e	• Aweó Zlor cevn Ges Aweó wefe cv_K`	• (3+5) Uv†dgvi†i `†U K†jxi g†a` cvi`ú†iK Av†ek N†U†q Aweó cevn I Aweó wefe cv_K` cix†Y†i gva`†g e`vL`v Ki†e Ges Uv†dgvi†i gjbxiZ e`vL`v Ki†e	• (3+5) Uv†dgvi†i gL` I t†MŠY K†jxi g†a` wefe, cv_K` cvK msL`v Ges cevn gv†v c†igvcKi†Y†i gva`†g	
4. gUi Ges tRbv†iU†ii gjbxiZ e`vL`v Ki†Z cvi†e	• gUi Ges tRbv†iU†ii gjbxiZ I Kv†μg	• mnvqK eZYx :		
5. Uv†dgvi†i gjbxiZ e`vL`v Ki†Z cvi†e	• Uv†dgvi†i gjbxiZ	• tPšak t†y† Øviv cevn m†ó Ges cevn Øviv tPšak t†y† m†ó (cvi`ú†iK Av†ek) A_vr tRbv†iUi Ges tgvU†ii gjbxiZ c†i†bv tUc†iKw†ii tgvUi L†j e`vL`v Ki†e	• tgvUi I tRbv†iU†ii wμqvbxix eSv†bvi `†yZ† hvPvB Gi gva`†g A_ev ewo†i KvR : tgvUi I tRbv†iU†ii g†Wj `Z†iKiY	
6. †÷c Avc I †÷c WvDb Uv†dgvi Kv†μg e`vL`v Ki†Z cvi†e	• †÷c Avc I †÷c WvDb Uv†dgvi Kv†μg	• †÷c Avc I †÷c WvDb Uv†dgvi†i e`envi D†jLceK Kv†μg e`vL`v Ki†e	• `B a†bi Uv†dgvi e`env†ii we†fb t†y† AbmÜvbKi†Y†i gva`†g	
Av†eMxq				
7. Avgv†`i Rxe†b Zwo`Zi bvbvi†ci e`envi I Gi Ae`vb†K cksmv Ki†Z cvi†e				

Îtq`k Aa`vq : AvabK c`v_ weÁvb I Btj±b · (14 wciqW)

wLbdj	welqe	wLb-tKL±bv wb`kbv	gj`vqb wb`kbv	wetkl t jLK wb`kbv
eixEiq 1. tZR@qZv e`vL`v KiZ cvite 2. Avjdv, weUv Ges Mgv iwk`i `eikó` e`vL`v KiZ cvite </li> <li>3. Btj±b · Gi µgveKvk eYbv KiZ cvite </li> <li>4. Gbvjm I wWRUvj Btj±b · Gi cv_K` KiZ cvite 5. Aacievevx Ges mgıSZ eZbx e`vL`v KiZ cvite 6. gvB±µvdvb I w`úKv`ii Kvµg e`vL`v KiZ cvite 7. wbeWPZ thvMvthvM chı³ wfvBtRi Kvµgi gjbZ e`vL`v KiZ cvite 8. BvUvbu Ges B-tgBj Gi m`nvth` thvMvthvM cıµqv e`vL`v KiZ cvite AbmÜvb 9. Z_ I thvMvthvM chı³ MZ wfvBm Kxfvte Avgv`i RxbhvıvK cfweZ KiZQ Zv AbmÜvb KiZ cvite </li> </ol> <p><b>AvteMxq</b></p> <ol style="list-style-type: none"> <li>10. Z_ I thvMvthvM chı<sup>3</sup> wfvBm mıVK I KvKı e`env`ii wbR mPZb nte Ges Ab`i mPZb KiZ	• tZR@qZv • Avjdv, weUv I Mgv iwk`i</li> <li>• Btj±b · Gi µgveKvk</li> <li>• Gbvjm I wWRUvj Btj±b ·</li> <li>• Aacievevx Ges mgıSZ eZbx</li> <li>• gvB±µvdvb Ges w`cKv`ii Kvµg</li> <li>• thvMvthvM chı<sup>3</sup> wfvBm-Kvµgi gjjZ <ul style="list-style-type: none"> <li>o tiwI,</li> <li>o tUvjfkb</li> <li>o tdvb (w`i I tgvevBj) - o d`v · tgıkb • BvUvbu I B-tgBj	• fwi tgşji (cvigvb wK msL`v 82 ev Zvi teik) wBıKqvm t_K tZR@q iwk`i wBgY eYbv KiZ • tZR@q iwk`i Dci Zıor tÿı ev tPşK tÿıı cfve ÷ wW Kti Avjdv, weUv, Mgv iwk`i `eikó` e`vL`v KiZ • BıZnvımi AvtjvK BtjKıb · Gi µgveKvk eYbv KiZ • AvtjvPvı gva`tg Gbvjm I wWRUvj BtjKıb · Gi avıv m`úo KiZ Ges wkyv_xıv Zv`i cv_K` KiZ • Aacievevx I mgıSZ eZbxı Pımn MvB I wµqv eYbv KiZ • kı<sup>3</sup> i iıcvşıı gva`tg gvB±µvdvb I w`úKv`ii Kvµg e`vL`v KiZ thgb kã, evq`ıı (gva`gi) Káub, c`vq AvNvZ, vqı tPşK tÿıı Ktqji bıvıv, Zıor Avtek, Awıo Zıor cevn, vqı • tPşK tÿıı Ktqji ga` Zıor cevn, Ktqji bıvıv, c`vq AvNvZ, evq`ıı (gva`gi) Káub, kã • tPşK tÿıı Ktqji ga` Zıor cevn, Ktqji bıvıv, c`vq AvNvZ, evq`ıı (gva`gi) Káub, kã • wkyv_x AvtjvPvı gva`tg BvUvbu Ges B-tgBj Gi gva`tg thvMvthvM cıµqv e`vL`v KiZ	• cv_K`i wıqmn cv_K`ıı YK t`ıL</li> <li>• MvB tKşji mıVKZv hvıvıvı gva`gı • cevn wPıı mıVK Abaveb KiZ cvıv • thvMvthvMı tÿıı BvUvbu I B-gBji eıgvıK e`envı mıvK ck Kti	• `eikó` cıqı AvKvıı jıL t`ıı qı mgıPb nte bı</li> <li>• cv_K` QK AvKvıı jıL t`ıı qı mgıPb nte bı</li> <li>• eK wPı e`envı Kti thvMvthvM chı³ wfvBtRi gjbZ I Kvµg e`vL`v KiZ nte

PZ`k Aa`vq : Rxe b e v P r t Z c`v_ e Á v b (14 w c i q W)

wkLbdj	welqe	wkLb-tkLtbv wbt`kbv	gj`vqb wbt`kbv	wetkl tjlK wbt`kbv
eixE xq 1. Rxec`v_ weÁvbi wfİE e`vL`v KiþZ cviþe </p> <p>2. Rxec`v_ weÁvb RM`xk P>` emi Ae`vb e`vL`v KiþZ cviþe </p> <p>3. gvbet`n c`v_ weÁvbi wbqþg cwİPwjZ nq e`vL`v Kiþe </p> <p>4. tivM wbyþq e`eüZ hšcwZþZ c`v_ weÁvbi aviYv I ZþEi e`envi e`vL`v KiþZ cviþe 5. AvaibK chw³ Ges hšcwZ e`envþii dþj mó`v` mgm`v Ges cwZþivþai tKškj e`vL`v KiþZ cviþe AvþeMxq 6. mwVK wPwKrmvi Rb` tivM wbyþqi ctqvRbxqZv mþúþK wbþR mþPZb nþe Ges Ab`þ`i mþPZb KiþZ cviþe </p> <p>7. tivM wbyþq weÁvb I chw<sup>3</sup>i Ae`vbþK cksmv KiþZ cviþe	• Rxe c`v_ weÁvb (Bio Physics) Gi wfİE</li><li>• RM`xk P>` emi Ae`vb • gvbet`n Ges hš</li><li>• tivM wbyþq e`enZ hšcwZ- - o G· -þi - o AvëmtþwMwd - o mwU`v`vb - o GgAviAvB - o BimwR - o GþÜvmþKwvc - o tiwI`_iwic</li><li>o BiUwU</li><li>o GbwiRMwd</li><li>o AvBþmwþUvþci e`envi • Dcþiv³ hšcwZ e`envþii dþj mó`v` mgm`v Ges cwZþivþai tKškj	• `óš mnKvþi Rxec`v_ weÁvbi wfİE e`vL`v • RM`xk P>` em c`v_ weÁvbi th bxwZ Rxe weÁvbi MþeIYq e`envi KþiþQb Zvi e`vL`v • `jMZ KvR: gvbþli tþvL, nvZ, KÜ`i, ü`hþši ,Lv` cwicvK Kvþug c`v_ weÁvbi wbqþg e`vL`v </li><li>• tivM wbyþq e`eüZ hšcwZþZ c`v_ weÁvbi th wbqg I ZþEi e`vL`v </li><li>• `jMZ KvR: tKvb tKvb hšcwZ v`þq tKvb tKvb tivM wbyq Kiv hvq Ges GB hš, þjv c`v_ weÁvbi th wbqþg cwİPwjZ nq Zvi e`vL`v QþK Dc`vcb	• welqe`þZ DþjwLZ hþši mwnvþh` tKvb tKvb tivM wbyq hvq Ges hšwU c`v_ weÁvbi th ZE ev bxwZi Dci wfİE Kþi cwZôZ nþqþQ Zv mstþþc weeZ KiþZ nþe  we`wiZ KvhcYvjx eYbv Kivi ctqvRb tbB Zþe wPÎ`_vKv evÄbxq	

W **k** **ÿ** **v** **μ** **g**

i **m** **v** **q** **b**

beg | **`** **k** **g** **†** **k** **w** **Y**

1. f_{wgKv}

ʷkʷmʷg Dbqb, beʷqb | ʷeʷiY GKʷU Pjgʷb cʷmʷq | eʷʷ³, mgʷR, tʷk, RʷZ | ʷeʷki Pʷnʷv, chʷ³MZ DbʷZ, ciʷteʷk, Kgmsʷtʷbi mʷhʷM eʷx BZʷʷi Kʷv ʷeʷteʷPʷv Kʷi ʷkʷvʷmʷgi
 Dbqb, beʷqb | ciʷgʷRb AZʷʷekʷKxq | Abʷʷbʷ tʷyʷtʷi gZ imʷqʷb | bZb chʷ³ | ʷeʷKʷtʷki dʷtʷ bZb ʷyZʷmʷaʷb gʷbemaʷtʷi Pʷnʷv eʷx cʷtʷQ | Zʷb ʷkʷvʷmʷgʷK hʷMʷcʷhʷMʷ Kivi Rbʷ
 imʷqb ʷkʷvʷmʷg cʷieZb Kiv cʷqʷRb |

eZgv#b gva`gK wky`vµg Dbq#bi Ask wnf#te imvqb wky`vµg cYqb Kiv n#q#Q| c`v#_i Af`šixY Mvb I crieZ#bi wElq, #jvB n#jv imvq#bi cabDcRxe`| imvq#bi crigwRZ wky`vµ#gi cab`^eikó` nj: G#Z `b`b` Rxe#b imvq#bi c#qvM, nv#Z Kjt#g KvR I imvq#bi cµqv i c#Z tRvi t`lqv n#q#Q| hvi d#j ev`e D`vni#Yi mv#\_ m#úwKZ K#i wky`v_xiv wElqe`#K mn#R Abaveb I w#kIY Ki#Z cv#e| gL` w`v` wbi#rmwvN Z#i wky`v\_x#`i Kg `y`Zvmaúb gvbem#ú` wnf#te ^Zri Kivi w`#K `wó t`lqv n#q#Q|

c_g t_†K Aóg t_kY chš «Ávb «kÿvµ†gi m†_ mvgÄm" †i†L GB «kÿvµg cYqY Kiv n†q†Q| GB «kÿvµg†K gŷbm†Z Kivi j†ÿ" «†ki DbZ I Dbqbkxj t`†ki eZgŷb «kÿvµg ch†j†vPbv Kiv n†q†Q| GKB m†\_ Avg†`†i t`†ki t†cÿvCU Ges «kÿv\_x, «kÿKmn mKj DcKv††vMxi Pwn`v «††Pbvq ivLv n†q†Q| «Ávb «kÿvq «kÿv_x†`†i AvMnx Kivi Rb" imvqb Aa"qb mnRZi I Avb>`vqK Kiv c†qvRb| «kÿv_x†`†i imvq†bi c†Z Drmŷn evov†bvi Rb" GB «kÿvµ†gi K†jei bv ev†††q RxbN†bô Kiv n†q†Q| cK†Z I cK†Z†Z msN†UZ Nubv†j m†††K «kÿv\_x†`†i Abm†Ürmŷn t†qU†bvi «`†KI G «kÿvµ†g «†ki t†Rvi t`†Iqv n†q†Q|

2. D#İk

1. imvq#bi aviYv, mi|c I , i#Z m#ú#K Rvbv|
2. imvq#bi Z_, Z# I tK#kj m#ú#K Rvbv Ges G, #jvi c#Z Abm#Ürm nIqv|
3. c`v#\_i Af`ŠixY Mb m#ú#K aviYv jvf Kiv|
4. tgvj-Gi aviYv jvf K#i imvq#bK MYbv Ki#Z cviv|
5. c`v\_mg#ni c#ieZ#bi mv#\_ k#<sup>3</sup> i m#úK #baviY, c#ieZb I k#<sup>3</sup>#K t#š#<sup>3</sup>Kfv#e e`envi Ges k#³ Drcv`#b Dch³ c#x#Z #bevPb Ki#Z m#ygZv ARb Kiv|
6. imvq#bK mgZv m#ú#K tR#b c#i#e#ki fvimvg` i#yvq m#ygZv ARb Kiv|
7. ^`b#`b R#e#b c#qvRbxq avZe I AavZe c`v\_ m#ú#K Rvbv Ges G, #jvi cbte`env#i Drm#vx nIqv|
8. Avgv#`i R#e#b K#eb t#š#Mi e`envi I , i#Z Abav#b Kiv|
9. K#I, #kí, #v` I M#n e`envh mvgMxi imvqb Ges #v` I c#i#e#ki Dci G#`i cfve m#ú#K tR#b #v`m#sZ I c#i#e#k#v#e`e` e`env#i AvM#x nIqv|
10. e`env#iK/ nv#Z-Kj#g Kv#Ri gva`#g Abm#Üvb `#yZv ARb Kiv|

3. Aa`vq ¶eb`vm I mgq eÈb

Aa`vq	¶c¶iqW	Aa`vq	¶c¶iqW
c_g : imvq#bi aviYv	8	Aóg : imvqb I k ³	28
¶ØZxq : c`vq_i Ae`v	12	beg : GimW-ývi mgZv	20
ZZxq : c`vq_i Mvb	12	`kg : LvbR mœú`-avZ-AavZ	15
PZ_ : chvq mvi¶Y	15	GKv`k : LvbR mœú`-Rxevk!	15
cÂg : imvq¶bK eÜb	20	Øv`k : Avgv#`i Rxe#b imvqb	28
Iô : tgvj Gi aviYv I imvq¶bK MYbv	18	†gvU:	216
mßg : imvq¶bK ¶e¶µqv	25		

4. $w_k \ddot{y}_v \mu g$ QK $i m v q b$

c_g Aa'vq : imvq#bi aviYv (wciqW 8)

«kLbdj	«elqe	«kLb tkLv#bvi «b#`kbv	gj`vqb «b#`kbv	«e#kl t jLK «b#`kbv
«xeE»q 1. imvq#bi aviYv e`vL`v Ki#Z cvi#e 2. imvq#bi tÿÎmgn «PiY`Z Ki#Z cvi#e </p> <p>3. imvq#bi mv#_«eÁv#bi Ab`vb` kvLvi m#úK e`vL`v Ki#Z cvi#e	- imvqb c«i«PvZ - imvq#bi c«i«a - imvq#bi mv#_«eÁv#bi Ab`vb` kvLvi (c`v_«eÁvb, Rxe«eÁvb, f-«eÁvb, M«YZ BZ`w`) m#úK	- ck- DĖ#i i gva`tg Av#j vPbv K#i imvq#bi tÿÎmgn «PiY`Z Ki#e - B#Z : «PiKrmv tÿ#Î, ^`b»`b Rxe#b, BgviZ «bgv#Y, «kí tÿ#Î, Lv``-msiÿ#Y, K«I tÿ#Î - imvq#bi mv#_«eÁv#bi «e#fb kvLvi m#úK «e#kó PvU : <div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; display: inline-block;">imvqb</div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 10px;"> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">c`v</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">t#c#Uvj «`#q B«Äb Pvjv#bv</div> </div> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Rxe«eÁvb</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Lv`` t_#K t`#ni k«³ Drcv`b</div> </div> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">M«YZ</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">AYi fi l AYi msL`v MYbv</div> </div> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">f-«eÁvb</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">MnYi Mvb Dcv`vb, D«™` l cvYx t_#K Rxe#k! Rvjv#bi i#c#š</div> </div> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">c«i#ek</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">c«i#e#ki Dcv`vb, c«i#ek `IY</div> </div> </div> </div> <p>ˆjMZ KvR : «fb D`vniY e`envi K#i imvq#bi mv#_«eÁv#bi Ab`vb` «e#l#qi m#úK t`«L#q PvU ^Z«i K#i tk«YK#ÿ Dc`vcb </p>	- tgšLK ck-DĖi - PvU Ges m«μq Ask MnY l cvi`ú«iK mn#h«MZvi g#bv fve	D`vniYmn imvq#bi mv#_Ab`vb` «eÁv#bi m#úK Av#j vPbv Ki#eb

wkLbdj	welqe	wkLb tkLv#bvi w#`kbv	gj`vqb w#`kbv	wetkl tJLK w#`kbv
ewxexq 4. imvqb cv#Vi , i#Z e"vL"v Ki#Z cvi#e 5. w#`ó avcmgn AbmiY K#i imvq#b AbmÜvb I M#eLYvi cwiKíbv cYqb Ki#Z cvi#e g#b#cikR 6. w#fb ai#bi AbmÜvbgjK Kv#Ri cwiKíbv cYqb, AbigZ w#Üš (hypothesis) Mvb I cixÿY (testing) Ki#Z cvi#e 7. imvq#b e"enwiK Kv#Ri mgq c#qvRbxq mZKZv Aeja#b Ki#Z cvi#e Av#eMxq 8. cKiZ I e"e Rxe#bi NUbveij imvq#bi `wó#Z e"vL"v Ki#Z AvMn c`kb Ki#e	- imvqb cv#Vi , i#Z - imvq#b AbmÜvb I M#eLYvi avcmgn - AbmÜvbgjK Kv#Ri cwiKíbv cYqb, AbigZ w#Üš (hypothesis) Mvb I cixÿY (testing) - imvq#b AbmÜv#bi mgq imvq#bK `e" msiÿY I e"en#i mZKZvgjK e"e"	`jMZ KvR:</b> ^`b`b e"envh e"i ZwjKv cYqb  G, #jvi g#a" imvq#bK Dcv`vbmgn wPyZ K#i G, #jvi , i#Z w#ePbvq imvq#bi , i#Z m#ú#K ciZ#e`b cYqb </li> <li>M#eLYvi w#fb avcmgn Av#jvPbv</li> <li><b>`jMZ KvR : `vbxq Rjvk#q cwb `IY ev Abi#c Ab" tKvb mgm"v AbmÜvb ev M#eLYvi avcmgn AbmiY K#i cwiKíbv Dc`vcb </li> <li>cwi#ek w#ePbvq D³ Rjvk#qi cwi#i cKwZ (A#Z/ÿviKZ) w#l#q nvB#cwi wmm Mvb Ges Zv tU÷ Kiv </li> </ul> <p>w#fb mZKZvgjK wPy Ges w#ec`RbK NUbvi Qie tcv÷v#i Dc`vcb/ wfwI wP#îi gva#tg t`wL#q Av#jvPbv Kiv </p>	- mVKfv#e imvq#bK Dcv`vb wPyZKiY I Zvi , i#Z Abaveb </li> <li>M#eLYvi avcmgn AbmiY I ciZ#e`b - nvB#cwi wmm Ges h_vh_ imvq#bK `e" e"envi Ges Dch³ mZKZv Aeja#b - mZKZvgjK wPy, #jv tPbv	D`vniY I avcmn imvq#bi AbmÜvb cwmqvmgn Av#jvPbv Ki#eb </li> <li>imvq#bK `e" msiÿY Kiv, t#iZ#j e"envi Kiv w#fb wPy m#ú#K aviYv w`#eb Ges GimW, ÿvi I `vn" c`v_ cvkvcwK ivL#j Kx iKg w#ec` n#Z cv#i Zvi aviYv w`#eb

⚡Ziq Aaṽq : c`vṽ_i Aeṽ (⚡ciqW 12)

⚡Lbd j	⚡elqe	⚡Lb †kLvṽbvi ṽbṽ`kbv	gjṽvqb ṽbṽ`kbv	⚡ekl †jLK ṽbṽ`kbv
⚡xexq : 1. KYvi MṽZZṽĖi ṽxKvṽhi mṽnvṽh` c`vṽ_i †fšZ Aeṽ eṽLv KiṽZ cviṽe 2. MṽZZṽĖi mṽnvṽh` eṽcb I ṽbtmiṽYi eṽLv KiṽZ cviṽe </p> <p>3. Kvṽb c`vṽ_i Mjb I EaṽcvZb Ges Zi j c`vṽ_i ùUb cṽμqv eYbv KiṽZ cviṽe </p> <p>4. c`vṽ_i †fšZ Aeṽ I Zṽṽci gṽa` mṽúK eṽLv KiṽZ cviṽe </p> <p><b>cixY</b></p> <p>5. Zṽcgvṽ eṽxṽZ eṽcb nvi eṽ cixYvi gṽaṽg †`LvṽZ cviṽe 6. Kvṽb c`vṽ_i Mjb I EaṽcvZb Ges Zi j c`vṽ_i ùUb cṽμqv cixYvi gṽaṽg †`LvṽZ cviṽe	- c`vṽ_KYvi MṽZZṽĖi ṽxKvṽh</li> <li>MṽZZṽĖ I c`vṽ_i †fšZ Aeṽ - eṽcb I ṽbtmiṽYi eṽe NUbv - eṽcb I ṽbtmiY - Mjb, eṽṽxKiY, Nbṽfeb, EaṽcvZb cṽμqv - c`vṽ_i †fšZ Aeṽ Dci Zṽṽci cfve - Zṽcgvṽ eṽxṽZ eṽcb nvi eṽ cixYv - eiṽdi Mjb, bṽdṽj I Kcṽii EaṽcvZb Ges ṽgṽgi Mjb (iṽmṽqṽK	- AÜKvi Nṽi †QvṽQ` ṽṽṽq Avṽjv coṽj ZṽṽZ ṽṽ` ṽṽ` KYvi ṽePiY †ṽṽṽQ ṽK bv Zv hvPvB Kiv </li> <li><b>jMZ KvR:</b> cṽbṽZ dṽj i ṽiY †Qṽo ṽṽṽq Gi PjvPj chṽṽY </li> <li>Dch<sup>3</sup> AṽfÁZvi mṽṽ KYvi MṽZZṽĖi ṽxKvṽhi mṽúK ṽcb  KYvi MṽZZṽĖi mṽṽ c`vṽ_i †fšZ Aeṽ mṽúK ṽekIY - djdṽji MÜ, †ṽṽ eṽenvi, cṽbṽZ ṽfb iO I evṽṽZ ṽṽfb Mṽmxq c`vṽ_i ṽbvṽṽi eṽcb I ṽbtmiṽYi aviYv cṽṽ GKK KvR: eṽcb I ṽbtmiṽYi gṽaṽg ṽkṽṽxi DckZ I ṽṽZMṽ nIqv i KvYmgn eYbv Kiv - ṽgv, AvBmṽμg, cṽb, bṽc ṽjṽb Zṽc ṽṽṽq I Vṽṽ Kṽi Mjb, Nbṽfeb, ṽṽṽ I EaṽcvZb cṽμqv I †fšZ Aeṽ cṽieZb mṽúK aviYv ARb Kiv - GKB gṽṽci ṽZbU Mṽṽ Vṽṽ, ṽṽṽek I Mig cṽb ṽbṽq cUṽmṽg cvigṽṽṽbU Kbv †Qṽo ṽṽṽq jvj KYvi Mṽṽi ṽṽṽ cṽṽ ṽcṽṽZ mgq MYbv Kṽi eṽcbnvi cixYv ṽjMZ KvṽRi gṽaṽg Kiv - eid, bṽdṽj, cṽb BZṽṽ cṽṽ eṽenvi Kṽi ṽjMZ KvṽRi gṽaṽg GB cixYv Kiv	- ck-Dṽṽi gṽaṽg ṽkṽṽxi AṽRZ AṽfÁZv hvPvB - mṽVK KvY ṽbYq - msNṽVZ cṽμqv, ṽjv cṽṽ I eṽLv - cixY ṽṽZv I cṽṽ djvdṽji ṽṽṽṽZ Mṽṽ ṽṽṽṽ	- c`vṽ_i ṽṽfb Aeṽ KYvi MṽZZṽĖi ṽxKvṽhi mṽnvṽh` AvṽjvPbv KiṽZ nṽe - eṽcb I ṽbtmiYṽK eṽe DṽṽṽYi gṽaṽg cṽṽṽZ Kiṽeb - Kṽṽb c`vṽ_i Mjb I Zi j c`vṽ_i ùUb cṽμqv ṽṽṽṽṽ mgq ṽṽṽ MjbṽK I ùUbṽK ṽekó cṽṽ DṽṽiY ṽṽṽṽ eṽenvi Kiṽeb

Pjgvb-2

[illegible]

ZZxq Aa"vq : c`v‡_i MVb (wciqW 12)

[illegible]

ZZxq Aa'vq : c`v`i MVb

(wciqW 12)

Pjgvb-2

wkLbdj	welqe	wkLb tkLv`bvi wb`kbv	gj`vqb wb`kbv	wetkl tkLK wb`kbv
eixEExq 7. cigvYi MVb mawK iv`vi`dW I tevi cigvY gW`ji eYbv KiZ cvi`e 8. iv`vi`dW I tevi cigvY gW`ji g`a` tkvU tevk MnY`hvM` Zvi e`vL`v w`Z cvi`e </p> <p>9. Kyct_ Ges Kyct_i wefb Dc`i cigvYi B`jKUbmgntK web`vm KiZ cvi`e	- cigvY gW`j               <ul style="list-style-type: none"> <li>iv`vi`dW cigvY gW`j I Gi mxgve`Zv</li> <li>tevi cigvY gW`j I Gi mxgve`Zv</li> </ul> </li> <li>kw³`i B`jKUb web`vm - cigvYi kw<sup>3</sup>`i I Dc`i - kw<sup>3</sup>`i B`jKUb aviY ygZv - B`jKUb web`vm	- tm`si RMr Gi wPÎ c`kb K`i (wPÎ/gw`ëwgWqv) c`kb K`i iv`vi`dW I tevi cigvY gW`j mawK Av`jvPbv Kiv `jMZ KvR:</b> iv`vi`dW I tevi cigvY gW`ji Zjbv Kiv - B`j±b web`v`mi 2n² mÎ Ges K,L,M,N- - BZ`w` kw³ `i B`j±b aviY ygZvi wPÎ/gw`ëwgWqv m`vnt`h` B`j±b web`v`mi Av`jvPbv  <b>`jMZ KvR : tevW Dc`wcz K`qKU cigvYi B`j±b web`vm tcv`v`i WqvMvg A¼`bi gva`tg tkwYK`y Dc`vcb Ki`e	- cigvY MVb mawKZ `wU gW`j G`K tkvU tevk MnY`hvM` Zvi KviY D`jL Kiv - B`jKUb web`v`mi mVKZv	- tevicigvY gW`ji Av`jvPbv AwU`ji kw³`i i aviYv w`tg kw³`i i kw<sup>3</sup> i cigvY wbYq mawYi`c eRb Ki`eb - Kyct_ B`jKUb web`v`miK wPÎ i gva`tg Dc`vcb Ki`eb KvMR, Kvg, is-tcYj e`envi K`i tevi gW`ji wPÎ AsKb welqK KvR w`teb

PZ_ Aa'vq : chvq mviY

(ic'iqW 15)

«kLbdj	«elqe	«kLb tkLv#bvi «b#`kbv	gj`vqb «b#`kbv	«ekl tjlK «b#`kbv
«xeE'xq 1. chvq mviYi «eKv#ki cUfng eYbv Ki#Z cvi#e 2. tgš#ji meewnt⁻ k³ t³i B#jKUb «eb`v#mi mv#_ chvq mviYi cavb M#c,tjvi m#úK «bYq Ki#Z cvi#e (c_g 30u tgšj) </p> <p>3. B#jKU#bi Kÿc#_i msL'v tR#b GKU tgš#ji chvq kbv<sup>3</sup> Ki#Z cvi#e (c_g 30u tgšj) </p> <p>4. chvq mviY#Z tKvb tgš#ji Ae`v#bi mv#_ Gi t#šZ I ivmvqibK a#gi m#úK Abgvb Ki#Z cvi#e 5. chvq mviYi K#qKvU ,i#ZcY tKvYi «ekl bvgKi#Yi KviY ej#Z cvi#e	- chvq mviYi «eKvk - cUfng - chvq mviYi «eikó «efb chvq mî - chvq mviYi gj «fiE - B#jKUb «eb`vm t_#K chvq mviY#Z tgš#ji Ae`vb «bYq - tKvY «bYq - chvq «bYq - tgš#ji chvqeE ag «efb tKvY#Z Dc`Z tgšjmg#ni «ekl bvg (ÿviaZ, grÿviaZ, g`vaZ, n`v#jv#Rb, «b@qM`vm, Ae`vši tgšj)	- tKvYK#ÿ «efb mg#q D`weZ chvq mviY tcv#vi tccv#i Dc`vcb K#i Gi «eKv#ki cUfng eYbv Kiv `jMZ KvR:</b> AvabK chvq mviY#Z chv#qi msL'v, tKvYi msL'v, ciZ chvq I ciZ tKvYi tgšj msL'v, tgš#ji cKvZ I t#šZ Ae`v eYbv K#i GKU PvU c`ZKiY </li> <li><b>`jMZ KvR: B#jKUb «eb`v#mi 2n² mî Øviv «bYxZ B#jKUb «eb`v#mi mv#_ chvq mviY#Z tgš#ji tKvY I chv#qi m#úK «bYq - chvqµ#G G#KKU tKvYi tgš#ji maviY «eikó` tev#W Dc`vcb GKK KvR: c`E tgš#ji m#e` t#šZ I ivmvqibK ag eYbv `jMZ KvR:</b> «b#`ó tKvYi «ekl bvg Ges «eikó`mg#ni g#a` m#úK c_K c_K PvU Dc`vcb	- Pv#Ui «elqe - tKvY I chvq «bYq - tgš#ji mVK ag Abaveb - Pv#Ui «elqe	- chvq mviYi «efb tgšj m#úK aviYv t`qvi mgq H tgšj Øviv MvZ c`v#_i «PÎ Dc`vcb Ki#eb  chvq mviYi «elqe tjlvi mgq B#jKUb «eb`vm#K «fiE «n#m#e «etePbv Ki#eb - tgš#ji chvqeE ag Dc`vcbvq «elqmg#K mnRfv#e c«i«PZ Ki#Z n#e  G#ÿ#t chvqeE agmgn «K «K Zv c«i«PZ KivB h#_ó n#e  GKB tKvYi GB agmgn GKB iKg nq Zvi aviYv «`teb chvqeE agmg#ni «eklY Kivi c#qRb tbB

wkLbdj	welqe	wkLb tkLvfbvi wbt`kbv	gj`vqb wbt`kbv	wetkl tJLK wbt`kbv
ewxeExq 6. chvq mviwYi ,iZ e'vL'v KiZ cviZe cixyv 7. chvq mviwYi GKB tkwYi tgšj Øviv MvVZ thšMi GKB aiZbi ag nvZ-Kjtg KvRi gva'tg c`kb KiZ cviZe </p> <p><b>gfbv'cikR</b></p> <p>8. cixyYi mgq KvPi hšcwZi mVK e'envi KiZ cviZe </p> <p><b>AvteMxq</b></p> <p>9. cixyY KvR mZKZv AejaB KiZe </p> <p>10. chvq mviwY AbmiY Ki tgšjmgtni ag AbgvB AvMn c`kb KiZe	- chvq mviwYi mweav - chvq mviwYi GKB Mzci tgšj Øviv MvVZ thšMi mv' cwlb I jN GvmWi weimvq - o avZe thšMi mv' cwlb I jN GvmWi weimvq Drcb M'vm cixyvi gva'tg kbv³KiY	AvabK chvq mviwYi PwU c`kb I ck-DĖi</li> <li>`jMZ KvR : Na₂CO₃, K₂CO₃, CaCO₃ Ges MgCO₃ Gtjei im/wmiKv(f#bMvi)/jN HCl thvM Kti Drcb M'vmK PZbi cwlbZ ctek KviZq Ges M'v'v'v' gta' Rjš KwV ctek KviZq wBMZ M'v'v'v' cixyV Kiv	- tgšLK ev wjwLZ ck-DĖi - cixyY KvR Ges imvqvBK aZgi mawK - chteyY	(CaCO₃, MgCO₃ Gtjei im/jN GvmW w'tq wBMZ M'v'v'v' cixyV imvqvBK weimvq Drcb M'vmK kbv³KiY mnRj f' cixyvi m'v'v'v' wbt'eb

cÂg Aa'vq : ivmviqbK eÜb

(icwiqW 20)

ikLbd j	ielqe	ikLb tkLv#bvi ib#`kbv	gj`vqb wb#`kbv	we#kl t jLK wb#`kbv
eixEëxq				
1. thvR`Zv B#jKU#bi aviYv e`vL`v Ki#Z cvi#e	thvR`Zv B#jKUB	cigvYi B#j#b web`v#mi wPÎ Dc`vcB K#i eint`#i i tRvo- we#Rvo B#j#bi wfiE#Z thvR`Zv B#j#bi aviYv c`vb		AvqibK eÜb, mgthvRx eÜb I avZe eÜb Dc`vcB Kivi t#y#Î wPÎ I B#jKU#bi aviYv e`envi Ki#Z n#e GLv#b AweUv#j i msKiY aviYv eRb Ki#e t#g#j i B#jKUB web`v#mi mv#_Zvi thvR`Zvi m#úK Dc`vcB Kiv c#qRb
2. wbi@iq M`vm Ges Gi w`ZkxjZv e`vL`v Ki#Z cvi#e	wbi@iq M`vm Ges Gi w`ZkxjZv	wbi@iq M`v#mi B#j#b web`vm P#U Dc`vcB K#i AóK I ^ØZ wbg#gi m#v#h` Gi w`ZkxjZv ev wbi@iqZvi e`vL`v		
3. AóK I `B-Gi wbg#gi aviYv e`vL`v Ki#Z cvi#e	AóK wbgg I `B-Gi wbgg	`jMZ KvR: P#U Dc`wicZ GKwaK th#Mi ivmviqbK eÜb (WU-µm c#Z) wPÎ t_#K AóK I `B-Gi wbg#gi e`vL`v Kiv	AóK I `B-Gi wbg#gi e`vL`v	
4. ivmviqbK eÜb Ges Zv MV#bi KviY e`vL`v Ki#Z cvi#e	ivmviqbK eÜb o ivmviqbK eÜb MV#bi KviY	`jMZ KvR: P#U Dc`wicZ GKwaK th#Mi ivmviqbK eÜb (WU-µm c#Z) wPÎ we#kIY K#i ôcigvYmgn wbi@iq M`v#mi B#jKUB web`vm AR#bi ceYZv t_#K ivmviqbK eÜb MVb K#iô cgvY	eÜb MV#bi mv#_ wbi@iq M`v#mi B#jKUB web`vm#K m#úKZ Kivi `yZv	
5. Avqb wKfv#e Ges tKb m#ó nq Zv e`vL`v Ki#Z cvi#e	K`vUvqb I Av`bvqb	tev#W Dc`wicZ wbi`ó t#g#j i B#jKUB web`v#mi m#v#h` AóK I `B Gi wbg#gi Av#jv#K K`vUvqb Ges Av`bvqb m#ó i KviY e`vL`v	ck-DËi	
6. AvqibK eÜb MV#bi cµqv eYbv Ki#Z cvi#e	AvqibK eÜb o AvqibK eÜb MV#bi cµqv	- weifb Avq#bi ms#KZ I B#jKUB web`v#mi wPÎ Dc`vcB `jMZ KvR: abvZ#K I FYvZ#K Avavb ckvgZ K#i Ggb fv#e weifb Avqb h³ K#i eÜb MVb Ki eÜb MV#bi wfiE#Z AvqibK eÜ#bi msÁv	Av#qwbK eÜb MVb cµqv i e`vL`v	
7. mgthvRx eÜb MV#bi cµqv eYbv Ki#Z cvi#e	mgthvRx eÜb o mgthvRx eÜb MV#bi cµqv	tKvb t#g#j i `B Gi AwaK B#j#b MnY ev eRb Kivi Rb` cPi k#³ c#qRb GZ k#³ m#aviYZ cvlqv hvq bv A_P G t#g#j- , #jvI wbi@iq M`v#mi B#j#b web`vm ARb Ki#Z Pvq GvU wKfv#e m#e Zv ck-DË#i i gva`tg wbariY  mgthvRx eÜ#bi msÁv c`vb	ck-DËi	

Iô Aa`vq : tgvj Gi aviYv I ivmvqibK MYbv (ic`iqW 18)

ikLbdj	ielqe	ikLb tkLv`bvi wbt`kbv	gj`vqb wbt`kbv	we`kl t`jLK wbt`kbv																				
ew`xeE`xq 1. tgv`jji aviYv e`envi K`ti mij MwYvZK wnmve Ki`Z cvi`te </p> <p>2. wbt`ó Nbgv`ivi `eY c`Z Ki`Z cvi`te </p> <p>3. tgš`jji cZxK, thšMgj`Ki ms`KZ I G`t`jvi thvRbx e`envi K`ti thš`Mi ms`KZ wjL`Z cvi`te 4. c`Ė Z` I DcvĖ e`envi K`ti thš`M Dc`Z tgš`jji kZKiv mshwZ wYq Ki`Z cvi`te	- tgvj I A`v`fv`M`Wv msL`v<ul style="list-style-type: none"><li>tgvj msL`v wYq - tgvjvi AvqZb - tgvj, tgvjvi fi, A`v`fv`M`Wv msL`v, tgvjvi AvqZb wfiĖK MwYvZK mgm`v - tgvjvi `eY ev tgvjw`iU - tgvjw`iUwfiĖK MwYvZK mgm`v - tgš`jji cZxK, thšMgj`K I thš`Mi ms`KZ - thš`M Dc`Z tgš`jji kZKiv mshwZ	MYbvi GKK WRb I nwj D`vniY wnmvte e`envi K`ti tgvj tK ivmvqibK c`v`_i cigv`Yi GKK wnmvte cwiPZ Ki`eb  thgb 12wU Kjq 1 WRb nq tZgwb th tKvb c`v`_i 6.02×10<sup>23</sup> wU AY`Z/cigv`Y`Z 1 mol nq tgv`jji mv`_ Mvg cvigv`YeK I Mvg Av`YeK f`ii m`uK e`vL`v Kiv <p>GKK KvR : QK ciY</p> <table><tr><th>c`v`_</th><th>cigvY</th><th>tgvj msL`v</th><th>AYi msL`v / cigvYi msL`v</th></tr><tr><td>H₂O</td><td>30 g</td><td></td><td></td></tr><tr><td>nxik/MvdvBU</td><td>24 g</td><td></td><td></td></tr><tr><td>CaCO₃</td><td>30 g</td><td></td><td></td></tr><tr><td>Ca₃(PO₄)₂</td><td>620 g</td><td></td><td></td></tr></table> <ul style="list-style-type: none"><li>`jMZ KvR : AvqZb wgwZK dv`/cwbi tevZj (250/500mL) tevZ`j wbt`³ e`envi K`ti NaCl/ M`KvR/Kcvi mvj`d`Ui (Z`Z) wbt`ó Nbgv`ivi `eY `Zwi </li><li>cZxK I thšM gj`Ki ms`KZ I Zv`i thvRbx e`envi K`ti wewfb thš`Mi ms`KZ tcv`v`i Dc`vcb K`ti Av`jvPbv  </li></ul> <p><b>GKK KvR:</b> tev`W Dc`wcZ cwZwU mw`i t`_tK GKwU K`ti tgš`j/ thšMgj`K wbt`q m`ve` mKj ms`KZ wj`L Dc`vcb </p>	c`v`_	cigvY	tgvj msL`v	AYi msL`v / cigvYi msL`v	H ₂ O	30 g			nxik/MvdvBU	24 g			CaCO ₃	30 g			Ca ₃ (PO ₄) ₂	620 g			Q`Ki mwVKZv </li><li>h`v`_ ciμqv AbmiY </li><li>mwVK ms`KZ t`jLv	tgvj`K ivmvqibK `e` cigv`ci BDwBU wnt`m`te Dc`vcb Ki`eb thgb GK WRb w`g 12 wU wWg v`K tZgwb GK tgvj ivmvqibK c`v`_ 6.023x10<sup>23</sup> wU KYv v`K  tgvjvi AvqZb wfiĖK MwYvZK mgm`v t`lqvi mgq M`v`mi m`I eRb Ki`eb </li><li>K`vcmt`bi gva`tg KvR w`q Qv`Ė-Qv`Ėx`i wbt`ó Nbgv`ivi `eY c`Z Kivi KvR w`teb
c`v`_	cigvY	tgvj msL`v	AYi msL`v / cigvYi msL`v																					
H ₂ O	30 g																							
nxik/MvdvBU	24 g																							
CaCO ₃	30 g																							
Ca ₃ (PO ₄) ₂	620 g																							

Iô Aa`vq : tgvj Gi aviYv I ivmvqwbK MYbv (wciqW 18)

Pjgvb-2

wkLbdj	welqe	wkLb tkLv`bvi wb`kbv	gj`vqb wb`kbv	wetkl tjLK wb`kbv
ewxeE`xq</b></p> <p>5. kZKiv mshwZ e`envi Kti j msKZ I AvYieK msKZ wbyq Kitz cvi`te </p> <p>6. tgsj I thšMgj`Ki cZxK, msKZ I thvRbx e`envi          Kti ivmvqwbK mgxKiY          wjL`Z Ges mgZweavb Kitz cvi`te </p> <p>7. ivmvqwbK mgxKiYi gwîK          Zvrch t`K wemµqK I Drcv`i fiwfiEK          MwYiZK mgm`v mgvavb Kitz cvi`te </p> <p><b>cixyv</b></p> <p>8. ZtZi tKjvm cwbi kZKiv          cigvY wbyq Kitz cvi`te gbv`cikR</b></p> <p>9. wbi<sup>3</sup> e`envi Kti ivmvqwbK `e` cigvc Kitz mÿg nte	• j msKZ I AvYieK msKZ o j msKZ I AvYieK msKZwfiEK MwYiZK mgm`v</li> <li>• ivmvqwbK mgxKiY              o ivmvqwbK              mgxKiYi              mgZweavb</li> <li>• ivmvqwbK mgxKiYi              gwîK Zvrch e`envi Kti Drcv`i cigvY wbyq • tKjvm cwbi o ZtZ tKjvm cwbi kZKiv cigvY wbyq	• wkÿ`Ki KvR</b> : wkÿK GKwU thšMi kZKiv mshwZ MYbv              Ges Zv e`envi Kti j msKZ I AvYieK msKZ MYbvi c×wZ e`vL`v GKK KvR : wewfb thšMi kZKiv mshw<sup>3</sup> I AvYieK fi t`K j msKZ I AvYieK msKZ wbyq  </li> <li>• <b>wkÿ`Ki KvR : tevW GKwU wbi`ó ivmvqwbK wemµqvi              wemµqK I Drcv` t`K ivmvqwbK mgxKiY tjLv I Zvi              mgZv Kiv   <b>GKK KvR</b> : tevW Dc`wcz ivmvqwbK mgxKiYmgn mgZv KiY • `jMZ KvR</b> : tevW mgZvKZ mgxKiY Dc`vcv Kti tgv`ji aviYvi mwnv`th` wemµq`Ki fi t`K Drcv`i fi Ges Drcv`i fi t`K wemµq`Ki fi MYbv Kiv </li> <li>• <b>`jMZ KvR : wbi`ó cigvY ZtZ wbtq tKjvm cwbi              kZKiv cigvY j`vetiUwi`Z wkÿ`Ki mnqZvq wbyq Kiv	• h_vh_fv`te j              msKZ I AvYieK              msKZ wbyq </li> <li>• mgxKiY mgZv </li> <li>• MYbvi mVKZv              wbyq </li> <li>• Dch³ Aej`ab cµqv	• Aa-ÿvi UvBtUkb Ges M`v`mi AvqZb wfwEK MYbv Ašf<sup>3</sup> Kiv eRb Kiteb • Rwi Dci GKwU wmiwqK cvî ti`L Zvi              Dci wbi`ó fti Kcvi mvj`dU (ZtZ) ti`L mv`v eY nIqv chš Zvc              w`tq DZB Kti WÊv Ae`vq cvDWt`ii fi `eZ wbyq Kti tKjvm cwbi kZKiv cigvY wbyq Kiv

mßg Aa'vq : ivmvgibK weµqv

(weiqW 25)

weLbd j	weiqe	weLb tklv#bv web`kbv	gj`vqb web`kbv	wekl t jLK web`kbv
ewxeE 1. tfßZ cieZb I ivmvgibK weµqv cv_K KißZ cviße 2. c`v`_i cieZbK wekly Kßi ivmvgibK weµqv kbv³ KißZ cviße 3. ivmvgibK weµqv tkiYefvM tiW·/bbtiW·, GKgLx/DfgLx, Zvc Drcv`x/Zvc nvix )KißZ cviße Ges weµqv cKvi kbv³ KißZ cviße </p> <p>4. weµqv Drcb Drcv` i cigvY jv-kvUijqv`i i bxiZi mnnvth` e`vL`v KißZ cviße 5. cieZb wekly Kßi RviY-weRviY weµqv cKvi kbv³ KißZ cviße	- tfßZ cieZb I ivmvgibK cieZb o tfßZ cieZb I ivmvgibK cieZb i wekó - ivmvgibK weµqv tkiYefvM (AatßycY, Aa-ÿvi ckgb I RviY-weRviY) I eYbv - jv- kvUijqv`i i bxiZ</li> <li>RviY-weRviY weµqv o wefb cKvi i RviY-weRviY weµqv o RviY msL`v I RviY msL`v wnmve o RviY-weRviY i BßjKUbq gZev` o RviY Aa I weRviY Aa weµqv RviY-weRviY weµqv hMcr NßU	- tfßZ I ivmvgibK cieZb i GKwaK D`vniY DßjL ceK AvßjvPbv gra`g tfßZ I ivmvgibK cieZb i aviYv jvf (Mvjv/ tgvG Mjv#bv, t jvni gviPv cov, tKiimb/ M`vm Rvjv#bv, we`qvkvBßqi KviV Rvjv#bv) GKK KvR : tevßW Dc`wcZ cieZb wekly Kßi KviYmn ivmvgibK weµqv kbv³ KiY </li> <li>Zvc, weµqv we`K Ges BßjKUb v`bvßßi i fweßZ ivmvgibK weµqv tkiYefvM e`vL`v  </li> <li><b>jMZ KvR</b> : tevßW Dc`wcZ AßbK, j weµqv wekó DßjLmn tkiY waviY Kiv - tevßW Dc`wcZ KZK, jv RviY weRviY weµqv wekly ceK RviY weRviY weµqv cKvi waviY </li> <li>tgßßj i thvR`Zv`ßi i BßjKUb/MnxZ ev Acmwiz BßjKUb msL`vi fweßZ RviY msL`vi aviYv e`vL`v  </li> <li><b>GKK KvR</b>: tevßW Dc`wcZ thßßMi RviY msL`v wbyq </li> <li>tevßW AvqibK weµqv wjßL RviY msL`vi fweßZ AvßjvPbv Kßi RviY I weRviY weµqv wPyßZKiY jMZ KvR: tevßW Dc`wcZ AvqibK weµqv tßK RviY Aa I weRviY Aa weµqv c_KiKiY	- mivK KviYmn ivmvgibK weµqv kbv³ KiY - KviY DßjLmn weµqv tkiY waviY - KviY DßjLmn weµqv tkiY waviY - RviY msL`vi wnmve - RviY Aa I weRviY Aa weµqv miVK c_KiKiY	weµqv tkiYefvM PßUi gra`g Dc`vcb Kiße weµqv gjZ wZb aißbi - AatßycY, Aa-ÿviK ckgb I RviY-weRviY msßhvRb, weßhvRb, cW`vcb, `nb G weµqv, jv RviY-weRviY weµqv Aßf³ nte

А́ог Аа`вқ : имвқб I кк³

(всвқв 28)

ккLbd j	ккlqe	ккLb †ккLv†bv †b†`kbv	гг`vqb †b†`kbv	кк†kl †jLK †b†`kbv
ккxеЕxq 1. имвқбк кквZ†bi мв†_ кк³ Drcv`†bi мкúK е`vL`v K†Z cvi†e	имвқбк кк³ o Zvc Drcv`x †еμqv I Zvcnvix †еμqv</li> <li>o †еμqv i кк³ †P†</li> <li>o еÜb кк³ I имвқбк †еμqv кк³ i кквZb</li> </ul> </li> <li>имвқбк кк³ †_†K Zvc кк³, †е`r кк³ I Av†jvK кк³ †Z кквZb (Pjv Rvjv†bv, е`vUvi, †gvgewZ)</li> <li>имвқбк кк³ †_†K cvlqv †е†fb кк³ Kv†R jvMv†bv (B†Äb Pvjv†bv, ivbv Kiv, †е`r Drcv`b, KjKivLv†bv Pvjv†bv)	`jMZ Kvr:</b> `B†U †еKv†i ev mnR jf` c†† cvb bvI  cv† `†Ui Zvcgv†v nvZ †`†q Abfe Ki  GK†U cv†† †KQUv Pb cvbi мв†_ Ges Aci cv†† †KQUv †m†Wqvг Kv†ev†bU `exfZ K†i nvB†W†K†iK G†mW †hvM Ki cbivq nvZ †`†q cv† `†Ui Zvcgv†v Abfe Ki c_g ev†i мв†_ кквZx Ab†Zi cv_K` †Kb nj Zv †evSvi †Póv Ki </li> <li>†cv÷v†i Zvc Drcv`x I Zvcnvix †еμqv i кк³ †P† Dc`vcb K†i Av†jvPbv </li> <li>Dc†i `jMZ Kv†Ri е`eüZ Pb I cvbi Ges †m†Wqvг Kv†ev†bU I nvB†W†K†iK G†m†Wi †еμqv еÜb f†vOv Mov †_†K Zvc Drcb I †k†IZ n†qv i Kv†Y е`vL`v </li> <li><b>`jMZ Kvr: `B†U Zvc Drcv`x †еμqv †jL Ges Zvc Drcb n†qv i Kv†Y е`vL`v Kiv †gvg Rvjv I Zvc I Av†jv cvlqv hvq †K bv ? `n†b †gvg Kvb Wb A·vBW I cvb Drcb nq  еÜb f†v†v Mov †_†K Zvc кк³ i кквZb Ges D††c B†jKU†bi K†úb †_†K Av†jv cvlqv i е`vL`v </li> <li>cvK N†i Pjvi †avqv ggjv j†y Ki  ††Yi †`vKv†bi ev`v†g †avqv †Z†qv i †Kgb j†vM ? Gi/c `†Y A†bK n†j †K n†e S Ges N h³ Rvjv†b (†Zj ev Kqv†) †cv††j SO₂ ev NO₂ M`vm Drcb nq	†gšLK ck-D††i †gšLK ck-D††i - Zvc Drcb n†qv i m†VK Kv†Y е`vL`v †gšLK ck-D††i	†fšZ кквZ†b Zv†ci кквZb Ges имвқбк †еμqv Zv†ci кквZb †elqvU кк†i@vi K†i Dc`vcb K††eb </li> <li>имвқбк кк³ †_†K cvlqv †е†fb кк³ Kv†R jvMv†bv †elqvU Dc`vc†bi Rb` †P††i Dci †Rvi †`†eb

¶kLbd j	¶elqe	¶kLb †kLv†bv ¶b†`kbv	gj`vqb ¶b†`kbv	¶e†kl †jLK ¶b†`kbv
ewxēxq 7. ¶e`r e`envi K†i (Zlor ¶e†klY) ¶eμqv msMvb Ki†Z cvi†e 8. ¶e¶fb c`v†_i Zlor ¶e†kl†Y Drcv`Z c`v_ Ges Gi ewY¶R`K e`envi mαú†K gZvgZ ¶`†Z cvi†e 9. Zlor imvqv†bK †KvI I M`vj fwbK †Kv†Ii g†a` cv_K` Ki†Z cvi†e </p> <p>10. ZjbvgjK ¶e†klY K†i cvi†gY¶eK ¶e`r Drcv`b mαú†K gZvgZ ¶`†Z cvi†e cixŷv 11. Zvcnvix I ZvcDrcv`x ¶eμqvi cixŷv	¶e`r e`envi K†i ¶eμqv msMvb - o ¶e`r c¶ievnx, avZe c¶ievnx I Zlor ¶e†kl` - o ZlorØvi I Zlor imvqv†bK †KvI - o Zlor ¶e†klY I Zlor ¶e†kl†Ii ¶eikó nIqvi †K†kj - o ¶m¶Wqv†g †KvivBW `e†Yi Zlor ¶e†klY</li> <li>o c¶bi Zlor ¶e†klY</li> <li>o Zlor ¶e†kl†Yi c†qvM</li> <li>o Zlor ¶e†kl†Y Drcv`Z c`v†_i ewY¶R`K e`envi</li> <li>¶bD†Kqv i ¶eμqv I ¶e`r Drcv`b	- c¶b/¶m¶Wqv†g †KvivB†Wi Zlor ¶e†klY K†i M`vm Drcv`b †`Lv†eb  †fRv ¶jUgvm KvMR ¶`†q †Kwib M`v†mi Dc¶`Z cgvY Ki†eb ¶kŷv_x†`i KvQ †_†K Zlor ¶e†kl` †Kv†Ii ¶eμqv, †jv Rvbvi †Póv Kiv Ges ¶dWe`vK †`qv GKK KvR: ¶jUgvm †ccv†i i eY cieZ†bi KvY e`vL`v `jMZ KvR:</b> Zlor imvqv†bK †KvI I M`vj fwbK †Kv†Ii g†a` cv_K`mn †cv÷vi cYqb Kiv ¶PÎ c`k†bi gva`†g/ evK †evW e`envi K†i ¶bDKxq ¶eμqv e`vL`v Ki†eb  ¶e`r Drcv`†bi e`q I †K†kj Gi m¶eav Ges †ZR¶`†q ¶e¶Ki†Yi ŷ¶ZKi ¶`K Av†jvPbv Kiv	m¶VK e`vL`vmn †Kv†Ii cv_K` ¶P¶ŷZKiY	

¶kLbd j	¶elqe	¶kLb †kLv†bv ¶b†`kbv	gj`vqb ¶b†`kbv	¶e†kl †jLK ¶b†`kbv
g†bv†c¶kR 12. jeY `exfZ I imvqubK c¶ieZb nlqvi mgq Zv†ci c¶ieZb cixÿvi mvin†h` †`Lv†Z cvi†e </p> <p>13. M`vj f¶wbK †Kv†li Z¶orØvi MVb Ki†Z cvi†e Av†eMxq 14. imvqubK `†e`i ÿ¶ZKi ¶`Kmgñ m¶ú†K m†PZbZv c`kb Ki†e 15. ¶eï× Rvjvwb e`env†i AvMn c`kb Ki†e	c`v_`exfZ K†i I imvqubK ¶e¶μqv Zv†ci c¶ieZb cixÿv	`jMZ KvR : Lv` jeY, A`†g¶bqvg †KvivBW I †m¶Wqvg n¶BW · vBW `exfZ K†i Zv†ci c¶ieZb cixÿv (¶f†bMvi I Kvco KvPv †m¶Wv), (†jei im I Kvco KvPv †m¶Wv) Ges (Pb I cwb) ¶g¶k†q ¶e¶μqv Zv†ci c¶ieZb cixÿv	cixÿY `ÿZv	

beg Aa`vq : GmW-ÿvi mgZv (wciqW 20)

wkLbd j	welqe	wkLb tkLvfbv wbt`kbv	gj`vqb wbt`kbv	wetkl t jLK wbt`kbv
ewxeExq 1. Aa, ¶vi l jeYi `eikó` e`vL`v KiZ cvi`e </p> <p>2. ciwPZ ciwte`ki c`v_, t`jvi ga` t`K Aa, ¶vi l jeYtK kbv³ KiZ cvi`e </p> <p>3. ¶viK l ¶vi RvZxq c`v`_i cv_K` KiZ cvi`e </p> <p>4. e`envh c`v`_i lci Aa l ¶v`ii cfve eYbv KiZ cvi`e 5. Mn`wj c`v`_i lci Aa l ¶vi RvZxh `te`i cfv`ei Avw_K , iZ gj`vqb KiZ cvi`e 6. pH Gi aviYv e`vL`v KiZ cvi`e </p> <p>7. pH ciwgtci , iZ e`vL`v KiZ cvi`e 8. ciwte`ki fvimg` iYvq Aa-ÿvi mgZvi , iZ Abareb KiZ cvi`e	- ciwPZ Aa, ¶vi l jeY - Aa, ¶viK l jeYi iwmvqibK `eikó` ¶viK l ¶v`ii cv_K` - c`v`_i lci Aa l ¶v`ii cfve o c`v`_i lci Aa l ¶v`ii cfve cixÿv - Aa l ¶v`ii cfv`ei A`bwZK , iZ</li> <li>pH l pH t`t`ji aviYv</li> <li>pH ciwgtci , iZ</li> <li>ckgb weµqvi , iZ o `b`b Rxe`b Aa l ¶vi ckg`bi fwgKv	`jMZ KvR</b>: ciwPZ c`v`_thgb Pb, NaCl t`jei im, µg, U`tc÷, k`v`ó, mvevb BZ`w` c`v`_tK mnRj f` wbt`k`Ki mwnv`h`-GmW, ÿvi l jeYi c_K ZwjKv `Zwi Kiv </li> <li><b>ewoi KvR</b>: t`jei i`mi gta`/imiKvi gta` ÷vcjvi wcb l t`QvU kvgtKi tLvjk w`tq chteY`Y Kiv Ges ciwZtbi KviY e`vL`v - AwaK gv`vi GmWwK l ÿvixq c`v`_e`envt`ii ÿwZKi cfve D`vniYi gva`tg Dc`vcb Kti (GmWwi ÿq, Kvco KvPvi ci nvZi AvO`t`ji ciwZb, AwZi³ GmWwq/ÿvixq RigZ dm`t`ji ÿZ BZ`w`) pH ciwgtci , iZ Av`jvPbv Kiv </li> <li><b>`jMZ KvR: Kwl Rigi gwUi pH wbyq Kti e`envh mvi maú`K gZvgZ Mvb Kiv - tgsgwQ/wccovi Kvto P`bi e`envi, AwZi³ GmWwUi KviY Gwmm`Wi e`envi, gvQ Pv`l cKti P`bi e`envi Ges Kwl t`y`t`i Aaxq/ÿvixq jeYi e`envi D`jLceK ciwte`k Aa ÿviK ckgb weµqvi , iZ Av`jvPbv Kiv	- ZwjKv mwVKZv hvPvB Kiv - ciwZtbi KviY e`vL`v - tg`LK ck-D`Ei - gwUi pH wetKIY l gZvgZ Mvb	Aa, ¶vi l jeY maú`K aviYv c`vb Kivi Rb` e`eüZ `te`i D`vniY w`teb

wkLbdj	welqe	wkLb tkLvþbv wb'kbv	gj'vqb wb'kbv	wekl tjlK wb'kbv
ewxexq 9. GmW ewóí KvY, ¶ZKi w`KmgN Ges Zv t_þK i¶vi Dcvq e'vL'v KiþZ cviþe </p> <p>10. cwbPµ e'vL'v KiþZ cviþe </p> <p>11. cwbi LiZv e'vL'v KiþZ cviþe </p> <p>12. Li cwb e'envþi míeavmgN DþjL KiþZ cviþe </p> <p>13. Li cwb e'envþi Av_K ¶Z e'vL'v KiþZ cviþe </p> <p>14. cwb `lþYi KvY I cwiþkvaþbi DcvqmgN eYbv KiþZ cviþe 15. AvþmþbKh³ cwb cþbi ¶ZKi w`K DþjL KiþZ cviþe cixv 16. pH cwigþci gva'tg Mþni/ j'þei/jeYv³ cwbi cKvZ wbYq KiþZ cviþe	- GmW ewó - GmW ewóí KvY - GmW ewóí ¶ZKi cfve I - tivþai Dcvq - cwb Pµ - cwbi LiZv - LiZv `ixKiY</li> <li>Li cwbi Amíeav</li> <li>Li cwb e'envþi Av_K ¶Z</li> </ul> <ul style="list-style-type: none"> <li>cwb `lY - cwbi AvþmþbK `lY</li> <li>Ab'vb' `lY - cwbþK `lYg<sup>3</sup> ivLvi Dcvq</li> <li>wbivc` cwbi , iþZ (Lvevi cwb I KvIKvþR e'envi Kiv cwb) - cwbi cKvZ wbYþq pH (pH tccvi e'envi Kþi)	- wkþKi mnqZvq GKU GmW cv_þii/wUm' tccvþii Dci tdþj cwieZb chþeY Ki Ges Gi AvþjvþK ÿZKi w`K máúþK Avþjvþbv </li> <li><b>ewoi KvR</b> : GmW ewóí KvY I cwiZþivþai DcvqmgN wPíY Kþi tkvY Kþý Dc'vcv Kiv </li> <li><b>jMZ KvR</b>: mg`, gvbI, Dv' I cYx e'envi Kþi cwb Pþµi mþPí tcvþvi ^Zvi I Dc'vcv Ki - Qíe/wfW I/gv'ëwq e'envi Kþi `wLZ cwbi ev'e wPí Dc'vcv ceK Avþjvþbv gva'tg cwb `lþYi aviYv c'vb - AvþmþbK Avµvš e'w³ i Qíe tevþW 'vcv Kþi ck DĒþii gva'tg cwbþZ AvþmþbK `lþYi aviYv `vb ewoi KvR : wKUZg Rjvkþq cwb `lþYi KvY I `lþYi djvdj I mave' cwiZKvþii Dcvq máúþK GKvU cwiZþe'b ^Zvi Kiv jMZ KvR: wvfb Drm t_þK cwb msMn Kþi Zvi cKvZ wbYq Ges pH cwiZþbi Dcvq máúþK gvZg Mvb	- mVK KvY I cwiZþivþai Dcvq wbaviY - cwbPþµi mVKZv - cwiZþe'þbi welqe - pH wbYþqi mVK cµqv I KvþRi cwiZ AvMn	

beg Aa`vq : Gmw-ÿvi mgZv (cwíqW 20)

Pjgvb-3

¶kLbd j	¶elqe	¶kLb †kLv†bv ¶b†`kbv	gj`vqb ¶b†`kbv	¶e†kl †jLK ¶b†`kbv
AbmÜvb 17. thšMmg†ni `e†Yi pH gvb  ¶bYq K†i ev ¶jUgvm ev  BD¶b fvmvj B¶Ü†KUi e`envi K†i thš†Mi cK¶Z Zjbv (Gmw, ÿvi) Ki†Z cvi†e g†bv†c¶kR 18. e`envi c`v†_i Ici A¶ I ¶v†ii cfve cixÿvi gva†g †`Lv†Z cvi†e </p> <p>19. A¶ I ÿvi RvZxq c`v_ e`envi†i† ¶¶†† h_vh_ ce  mZKZvgjK e`e_v MnY Ki†Z cvi†e Av†eMxq 20. `lYg<sup>3</sup> cwb e`envi†i AvMn c`kb Ki†e </p> <p>21. Gmw mšv†mi fqven `K m¶úK m†PZbZvi c¶iPq ¶`†e Ges Ab†`i†K m†PZb Ki†Z cvi†e	¶e¶fb thš†Mi `e†Yi pH ¶bYq</li> <li>c`v†_i Dci A¶- ÿv†ii cfve cixÿv - A¶ I ÿvi e`envi†i c†e mZKZvgjK e`e_v	Gmw mšv†mi fqvenZv m¶úKZ †kvMvb †cv÷v†i ¶j†L ¶¶j i †`qv†j Uwb†q †`qv I ¶vbxqfv†e m†PZbZv m¶ói Rb`  K`v†¶úBb Kiv	m†PZbZvgjK KgKv†Ê m¶µq AskMnY	

`kg Aa"vq : LwbR mσú` : avZ-AavZ (wcwiqW 15)

«Lbdj	«lqe	«Lb tklv bv «bt`kbv	gj`vqb «bt`kbv	«ekl t jLK «bt`kbv
«x«E»q 1. LibR «óú†`i avIYv eYbv Ki†Z cvi†e </p> <p>2. «kjv, LibR I AvKii†Ki g†a` Zjbv Ki†Z cvi†e 3. avZmgn «b@vk†bi Dch³ Dcvq «baviY Ki†Z cvi†e 4. avZmsKi `Zrii KviY e`vL`v Ki†Z cvi†e </p> <p>5. mvjdv†ii Drm Ges G†`i KiZcq c†qvRbxq †hSM c`†Zi «e«µqv, ivmqibK a†gi eYbv Ges M†n, «k†í I K«l†ý†Î Zv e`env†ii , i†Z «e†kIY Ki†Z cvi†e 6. LibR `†e`i mmxgZv, h_vh_ e`envi I cbte`env†ii , i†Z «e†kIY Ki†Z cvi†e Av†eM»q 7. LibR `†e`i e`env†i mZKZv Ges msiý†Y AvMn c`kb Ki†e	- g«U«i «b†P cvß c`v_mgn</li> <li>«kjv, LibR I AvKii†Ki g†a` «óúK Zjbv Ki†Z cvi†e - avZmgn «b@vk†b Dcvq (Zior «e†kIY I Kieb «eRviY) - avZi m«µqZv «m«iR - avZi Drm (LibR I AvKiiK) - Zior «e†kIY I Kieb «eRviY c««Z - avZmsKi I avZmsKi e`env†ii KviY</li> <li>mvjdv†ii Drm, AvniY I e`envi Ges cvi†e†ki Dci Gi cfve - mvj«dD«iK GimW c`«Z, ivmqibK a†gi eYbv Ges «k†íý†Î Zv e`env†ii , i†Z «e†kIY - LibR Dcv`vbmgn†i cbte`envi (avZ«óú` I R«e†ki Rvj«bi mmxgZv I msiý†Yi Dcvqmgn)	«e«fb AvK«ii†Ki «PÍ/vf«Wl/g««e«gWqv Dc`vcb K†i ck DĚ†ii gva†g LibR «óú†`i avIYv jvf Kiv - m«µqZv «m«iR †ev†W Dc`vc†bi gva†g Av†jvPbv K†i avZ «b@vk†bi Dcvq eYbv </li> <li><b>jMZ KvR:</b> †ev†W Dc`vicZ avZ†K/avZmgn†K «b@vk†bi Dcvq Ges m«ve` «e«µqv «óú†K gZvgZ Mvb Kiv </li> <li>msKi avZ †hgb-Kvmv, «cZj, «÷j, g`v, Ges «KQ «e`x avZ †k«Y†Z Dc`vcb K†i avZe eÜ†bi mrvn†h` msKi avZ `Z«ii KviY e`vL`v c`vb </li> <li><b>GKK KvR :</b> e`enviKZ mKj avZe c`v_ (†hgb `v, e«U, Q«i, avZeK`vb, «Ub, A`vj«gibqv d†qj, †`c K`vb) e`env†i I msiýY I cbte`env†ii Rb` e`em«qi «bKU n`vši K†i m†PZbv c`kb Kiv	- tgš«LK ck-DĚi - avZ «b@vk†bi Dcvq «baviY - tgš«LK ck-DĚi - Kv†R AvMn	avZmgn «b@vk†bi Rb` «b«`ó †Kvb avZ «b@vk†bi eYbv bv K†i avZ «b@vk†bi c««Zi Dci , i†Z «`†q «jL†eb

GKv`k Aa`vq : LwbR mǎú` -Rǎvk (¶cǎiqW 15)

¶kLbdj	¶elqe	¶kLb ¶kLv¶bv ¶b¶`kbv	gj`vqb ¶b¶`kbv	¶e¶kl ¶jLK ¶b¶`kbv
e¶xeǎq				
1. Rǎvk! Rvjwbi aviYv e`vL`v Ki¶Z cvi¶e	• ¶c¶Uwjqv¶gi Dcv`vbmgn</li> <li>• ¶c¶Uwjqv¶gi e`envi	• ¶e¶fb ai¶bi Rǎvk! Rvjwbi ¶PÎ/¶f¶Wl/g¶ë¶g¶Wqv c`kb K¶i ¶e¶fb Rǎvk! m¶ó¶i c¶µqv eYbv Kiv </li> </ul> <p><b>`jMZ KvR : ¶e¶fb ¶ý¶Î ¶c¶Uwjqv¶gi e`env¶i i ZwjKv K¶i ¶k¶Y¶Z Dc`vcb </p>	• ZwjKvi ¶elqe`	
2. ¶c¶Uwjqv¶gi K`Re ¶h¶š¶Mi ¶gkY ¶n¶m¶e e`vL`v Ki¶Z cvi¶e				
3. ¶c¶Uwjqv¶gi e`envi e`vL`v Ki¶Z cvi¶e				
4. nvB¶WvKve¶bi aviYv I ¶k¶Y¶efvM e`vL`v Ki¶Z cvi¶e	• nvB¶WvKveb o nvB¶WvKve¶bi ¶k¶Y¶efvM	• ¶cv÷v¶i nvB¶WvKve¶bi ¶k¶Y¶efvM ¶k¶YK¶ý Dc`vcb K¶i nvB¶WvKve¶bi ¶k¶Y¶efvM Av¶jvPbv </li> </ul> <p><b>GKK KvR:</b> nvB¶WvKve¶bi ¶k¶Y¶efvM ¶`¶L¶q GK¶U WvqvMvg/¶PÎ AsKb </p>	• ¶k¶Y¶efv¶Mi m¶VKZv	
5. mǎú ³ I Amǎú ³ nvB¶WvKve¶bi c`¶Zi ¶e¶µqv I ag e`vL`v Ges G¶`i g¶a` cv_K` Ki¶Z cvi¶e	• mǎú³ I Amǎú³ nvB¶WvKve¶bi c`¶Zi ¶e¶µqv I ag	• `jMZ KvR:</b> mǎú³ I Amǎú³ nvB¶WvKve¶bi Mvb I `e¶kó`MZ cv_K` D¶jL K¶i GK¶U PvU cYqb	• P¶Ui ¶elqe`	• mǎú³ I Amǎú³ nvB¶WvKve¶bi cv_K`Ki¶Y Zǎxq aviYv jvf Ki¶e
6. cv÷K`e` I Zš`Z¶i i i¶mvqibK ¶e¶µqv Ges Gi e`envi eYbv Ki¶Z cvi¶e	• cv÷K`e` o cv÷K c`¶Z (c¶jgviKiY ¶e¶µqv)	• cv÷K mvgMx I ¶e¶fb ai¶bi Zš Dc`vcb K¶i ¶e¶µqv i gva`tg cv÷K mvgMx `Z¶i i c¶µqv e`vL`v Kiv GKK KvR: Zvrch D¶jLmn ¶e¶fb g¶bvgv¶i i c¶jgviKiY ¶e¶µqv i mgxKiY ¶jLv	• Zvrchmn c¶jgviKiY ¶e¶µqv i mgxKi¶Y i m¶VKZv	

¶kLbd j	¶elqe	¶kLb tkLv#bv ¶b#`kbv	gj`vqb ¶b#`kbv	¶e#k! ¶jLK ¶b#`kbv
¶e¶e¶xq 7. c¶i#e#ki lci c¶÷K`e`h_vh_ e`envi bv Kivi Kdj D#jL Ki#Z cvi#e </p> <p>8. cvK¶ZK M`vm, ¶c#Uwjqvg Ges Kqjv e`env#i i m¶eav-Am¶eav l e`env#i i ¶K#kj e`vL`v Ki#Z cvi#e 9. nvB#WvKv¶b ¶_#K A`vj#Kv¶j, A`vj¶WnvBW l ^Re G¶m#Wi c`¶Zi ¶K#kj e`vL`v Ki#Z cvi#e </p> <p>10. A`vj#Kv¶j, A`vj¶WnvBW l ^Re G¶m#Wi e`envi e`vL`v Ki#Z cvi#e	- c¶i#e#ki Dci c¶÷K`e`i c¶ve - cvK¶ZK M`vm l ¶c#Uwjqvgi h_vh_ e`envi - A`vj#Kv¶j, A`vj¶WnvBW l ^Re G¶m#Wi c`¶Zi nvB#WvKv¶bi e`envi - A`vj#Kv¶ji e`envi - A`vj¶WnvB#Wi e`envi ^Re G¶m#Wi e`envi	Q¶e/¶P¶/¶f¶W l ¶`¶L¶q c¶i#e#ki Dci c¶÷K`e`i c¶ve mǎú¶KZ Av#jvPbv </li> <li><b>¶e¶oi KvR</b>: cvK¶ZK M`vm l ¶c#Uwjqvg e`env#i i DcK¶wiZv l AcK¶wiZvi ZwjKv ^Z¶i </li> </ul> <div> <pre> graph TD     A["A`vj#Kv¶j"] --> G["G÷vi"] A --> N["nvB#WvKv¶b"] A --> B["A`vj¶WnvBW"]     G --> M["G¶mW"]     N --> M     B --> M     M --> A   </pre> <p>Abi c ¶P¶ ¶cv÷v#i Dc`vcb K#i ¶e¶fb ^Re thv#Mi c`¶Zi ¶e¶¶qv c`kb ceK nvB#WvKv¶bi , i#Z eYbv Kiv </p> <p>¶jMZ KvR: nvB#WvKv¶b ¶_#K mKj ¶k¶Yi ^Re th#M cvlqv hvq, ¶e¶¶qv gva`g Dc`vcb </p> </div>	- tg#LK ck-D¶i - Zwjkvi ¶elqe`i m¶VKZv gj`vqb Kiv - tg#LK ck-D¶i ¶e¶¶qv m¶VKZv	- ivbvi Rvjv¶b ¶n#m#e e`env#i i Zjvq ¶e`Z Drcv`#b Ges Ab`vb` c#qvRbxq `e` Drcv`b ¶e¶k c#qvRbxq GB aviYv ¶`¶eb </li> <li>nvB#WvKv¶b ¶_#K A`vj#Kv¶j, A`vj#Kv¶j ¶_#K A`vj¶WnvBW, A`vj¶WnvBW ¶_#K ¶Re G¶mW c`¶Z - A`vj#Kv¶j, A`vj¶WnvBW l ^Re G¶m#Wi c`¶Z, ag l e`envi ¶jLv¶ mgq ¶agv¶ A¶aK e`env¶i K ¶h#M mǎú#K Av#jvPbv Ki#eb

¶kLbd j	¶elqe	¶kLb †kLv†bv ¶b†`kbv	gj`vqb ¶b†`kbv	¶e†kl †jLK ¶b†`kbv
AbmÜvb 11. c¶i†e†ki Dci c¶i÷K`†e`i cfve mæú¶KZ AbmÜvbgjK KvR Ki†Z cvi†e g†bv†c¶kR 12. cixÿvi gva†g ^Re I A¶Re thš†Mi g†a` cv_K` K†i †`Lv†Z cvi†e  <b>Av†eMxq</b> 13. Rævk! Rvj¶bi m¶VK e`envi mæú†K m†PZbZv c`kb Ki†e	- c¶i†e†ki Dci c¶i÷K`†e`i cfve mæú¶KZ AbmÜvbgjK KvR - cixÿvi gva†g ^Re I A¶Re thš†Mi g†a`                            cv_K`KiY	`jMZ KvR: c¶i†e†ki Dci ¶e¶fb c¶i÷K mvgMxi                            (c¶ij_b) h_vh_e`envi bv Kivi ÿ¶ZKi cfve mæú¶KZ GK¶U AbmÜvbgjK ciZ†e`b cYqb I Dc`vcb `jMZ KvR: Mjb¶sK, ùUbv¶sK Ges`ve`Zvi Av†jv†K ^Re I                            A¶Re thš†Mi cv_K` ¶bYq	- c¶iZ†e`†bi ¶elqe`i h_v_Zv I Kv†Ri c¶iZ AvMn ^e¶kó` ¶e†klY K†i                            cv_K` ¶bYq	^Re I A¶Re thš†i g†a` cv_K` Ki†Z mnR cixÿv e`envi Ki†eb                             thgb- ¶P¶b,BD¶iqv I                            jeY†K Avjv`v Pvg†P ¶b†q Zvc ¶`†j ¶P¶b I BD¶iqv D†o hv†e ¶KŠ jeY P¶vg†P_vK†e

Øv`k Aa`vq: Avgv`i Rreþb imvqb (¶cwiqW 28)

¶kLbdj	¶elqe	¶kLb þkLvþbv ¶bþ`kbv	gj`vqb ¶bþ`kbv	¶eþkl þjLK ¶bþ`kbv
ewxexq 1. Mþn e`envh K¶Zcq Lv` mvgMxi AvniY, ag I e`envþii , iz ¶eþkIY KiþZ cviþe </p> <p>2. Mþn cmvab mvgMxi Dcþh¶MZv ¶baviþY pH Gi , iz eYbv KiþZ cviþe </p> <p>3. Mþn e`envh cwi@wiK mvgMxi c`¶Z I cwi@wi Kivi þKškj e`vLv KiþZ cviþe	<p>• Mþn e`envh K¶Zcq Lv` mvgMxi AvniY, ag I e`envi</p> <ul style="list-style-type: none"> <li>o NaCl AvniY, ¶eþxKiY I e`envi - o NaHCO₃ þK Livi tmWw I teþKs cvDWvi wntmþe e`envi</li> <li>o ¶fþbMvi Kx Ges ¶fþbMþii e`envi - o þKvgj cvþq Gi Dcv`vb Ges Gi ývZKi ¶`Kmg <p>• cmvab mvgMxi Dcþh¶MZv ¶baviþY pH Gi , iz</p> <p>• Mþn e`envh cwi@wiK mvgMxi c`¶Z, ag I cwi@wi Kivi þKškj</p> - o Kivco KivPv tmWw (Na₂CO₃·10H₂O) Gi ag I e`envi	• ewoi KvR: GK¶U þUþZ NaCl Gi Rjxq `eY ¶bþq tiþþ` tiþL ¶`þq cþii ¶`b Avil ¶KQ cwiqvY Gi Rjxq `eY þXþj `vI Gfvþe c¶Z ¶`b ¶KQ cwiqvY jeþYi Rjxq `eY thvM Kþi 7 ¶`b chš chþeyY Kþi jeYv³ cwb þ`þK jeY AvniþYi þKškj AvqĚ Kiv • `jMZ KvR:</b> ¶KQ cwiqvY gq`v cwbþZ thvM Kþi þMvjvKvi eþji gZ `Zii Kþi Zvi ¶VK gvSLvþb ¶KQ cwiqvY teþKs cvDWvi cþek Kviþq `B nvþZi Zvji mwnvþh` ej¶UþK m`ifvþe þMvj Kþi Avþ` Avþ` Zvþc DZ`B Kiþe  Abiþcfvþe teþKs cvDWvi Qvov GKB KvR Kþi `¶Ui cv`K` chþeyY Kþi KviY ¶eþkIY Kiv • `jMZ KvR:</b> Kvco KvPv tmWw cwbþZ ¶g¶kþq ¶j Ugvm tccvþii mwnvþh` cixýv Ki Ges ag mþúþK gZvgZ c`vb Kiv	• jeYv³ cwb þ`þK jeY AvniþYi þKškj AvqĚ Kiv </p> <p>• teþKs cvDWvi þi fvgKvi e`vLv • tgš¶LK ck-DĚi	• ¶ewfb þhšþMi c`¶ZþZ eYbvqjK Gi Zjbvq m¶µq AskMnYgjK KvþRi Dci þRvi þ`lqv cþqvRb

«kLbdj	«elqe	«kLb t«Lvþbv «bþ`kbv	gj`vqb «bþ`kbv	«eþkl t jLK «bþ`kbv
«ixeE«q 4. K«lþÿþÎ Dch³ thšM e`envi Kþi g«Ui pH gvb «bqšY KiþZ cviþe </p> <p>5. K«l`e` c«µq«KiþYi Dcvq e`vL`v KiþZ cviþe </p> <p>6. K«l`e` msiÿþYi Dcvq e`vL`v KiþZ cviþe	o mveþbi c`Z I Gi gqjv c«i«vi Kivi tKškj</p> <p>o «WUviþRþUi c`Z I o Gþ`i gqjv c«i«vi Kivi tKškj</p> <p>o K«÷K t«mWv (NaOH) Gi c`Z, ag I e`envi</p> <p>o «e«Ps cvDWvi; Ca(OCl)Cl Gi ag I e`envi o NH<sub>3</sub> Gi c`Z ag I e`envi • K«lþÿþÎ e`eüZ Dch³ thšM«i cvc`Zv, ag I e`envi</p> <p>o Pb (CaO) I Pbvc`i (CaCO<sub>3</sub>) Gi cvc`Zv ag Ges «kí I K«lþÿþÎ e`envi o BD«iqvi c`Z, ag Ges K«lþÿþÎ e`envi o (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> Gi c`Z, ag Ges K«lþÿþÎ e`envi	• `jMZ KvR: tZj, t«mWqvg nvBþWv - vBW, jeY, «eKvimn cþqvRbxq DcKiY «bþq mvevb c`Z Kþi Zv «`þq gqjv K«co c«i«vi Kiv </p> <p>• «PþÎ mveþbi nvBþWvKveb Ask Ges Avq«bK Ask t`«Lþq gqjv c«i«vi Kivi tKškj eYbv • `jMZ KvR: i«Ob Kvco/ tgvUv k³ i«Ob KvMRþK «e«Ps cvDWvi «g«kZ c«vbþZ W«etq tiþL cþi«i «`b c«ieZb t`þL Zvi KviY e`vL`v </p> <p>• `jMZ KvR: tcvov g«U/jvj g«U, c«jg«U, Kv`v g«U BZ`v`i pH «bYq Kþi g«Ui pH nvm e«× Kivi Dcvq m«úþK gZvgZ Mvb	• mvevb c`Zi `ÿZv • tğšLK ck-DEi • c«ieZþbi KviY e`vL`v • pH nvm- e«× Kivi Rb` m«VK Dcv`vb «bevPb	

vkLbdj	velqe	vkLb tkLvþbv vb`kbv	gj`vqb vb`kbv	vetkl tjLK vb`kbv
eixEixq 7. imvqibK eR" maúþK tRþb Gi ýZKi cfve e`vL`v KiþZ cviþe cixýv 8. imvqibK `e" e`envi Kþi mvevb c`Z KiþZ cviþe </p> <p><b>AbmÜvb</b></p> <p>9. gwU, cwib l evq`LY tivþa imvqibK `þe"i h_vh_ e`envi velþq Av`vi mvþ_`ZtùZ gZvgZ v`þZ cviþe </p> <p><b>gþbvþcirkR</b></p> <p>10. wePs cvDWþii weiÄb vµqv c`kb KiþZ cviþe 11. Lv` `þe" teKs cvDWþii figKv cixývi gva`tg t`LvþZ cviþe AvþeMxq 12. v` mþPZb `e" e`envþi AvMn c`kb Kiþe 13. v` mþZ Lv` `e" e`envþi AvMn c`kb Kiþe	o KllþýþÎ AAZi<sup>3</sup> mvi e`envþii ýZKi cfve</p> <p>o Kll`e" cµqvKiþY o e`envh imvqibK `e" o Kll`e" msiýþY e`envh imvqibK `e"</p> <p>• imvqibK eR" (fvix avZ, KxUbvkK, vkí is, U`vbwi eR", mvevb, vWUviþRvU) Gi ýZKi cfve • mvevb c`vZ</p> <p>• gwU, cwib l evq`LY tivþa imvqibK `þe"i h_vh_ e`envi msµvš • wePs cvDWþii weiÄb vµqv c`kb</p> <p>• Lv` `þe" teKs cvDWþii figKv cixýv	• `jMZ KvR</b>: KxUbvkK, imvqibK mvi, vkí KvLvbvi eR" Øviv Kll l v`v`i Dci ýZKi cfve maúþK GKlU cZþe`b`Zvi Kþi Dc`vcb Kiv • evoi KvR: evRvi t`þK tkbv dj Ges evoi MvþQi dj cvkvck tþL v`þq`B/vZb v`b ci cwieZb chþeýY Kþi tkYþZ AvþjvPbv Kiv • wefb vkí eþR"i Qie/vPÎ/vfW l Ges XvKvi Pvi`þKi b`xi cwbi Qie t`vLþq Zvi ýZKi cfve maúþK AvþjvPbv	• cZþe`þbi velqe` • tgšLK ck-DËi	

W **k** **ÿ** **v** **µ** **g**

R **x** **e** **w** **e** **Á** **v** **b**

b **e** **g** **|** **`** **k** **g** **†** **k** **w** **Y**

1. figKv

GKesk kZiãx n"Q RxeÁvbi eKvki GKU , iZcY kZK | RxeÁvb kyvi gj DcRxe" n"Q Rxb t_K ZwEK I cvqMK kyv MnY | Avi kyv MnYi avvevnKZvq cKIZ I RxbtK Rvbv GKU AbxKh elq | beg I `kg tkYi RxeÁvbi bZb kyvµtg Avb`i mv_ RxeRMZtK Rvbi tmB mthvM mío Kiv ntqQ| GLvb RxeÁvtK Rvbi Rb` eÁvbK avYv I ZtEi cvkvk RxbfEK cvqMK týtIi Dci I , iZ t`lqv ntqQ|

ZiY cRb bRtK I bRi ciitekK fvj fve Rvbe Ges msiY KiGe GB cZvk AvR mevi| GB cZvk mvgtb tiL gybe I ciitekMZ `K, tjtK hMvchvMx Kti Ztj ati kyvµtg mbtek Kiv ntqQ | msh<sup>3</sup> ntqQ eZgvb tcyvcU wefb tivMZtEi I Rxechn<sup>3</sup> i cv\_gK avYv | GtZ kyv\_xiv t`tki Dbqtb bZb bZb ch³ e`envi i Ges ev`efEK wefb mgm`v mgva`bi `yZv ARb KiGe|

RvZvq kyvbvZ 2010 Gi AvjtK eÁvbgb® RvZ Movi Dci bZb kyvµtg , iZ t`lqv ntqQ| kyv\_xt`iK gL`bfi covtjLv t\_K biamvvnZ Kitz ev`e I RxbfEK wefb elqi D`vniY Ztj ati Zvi mve` cZKvigjK `K, tjt ivLv ntqQ | Gi dtj kyv\_xiv AbmÜrm nte Ges wfb wfb AvtztK RxeRMZtK Rvbi AfÁZv ARb KiGe | Avi kyvKe`I Dch³ kLb-tkLvbt tKškj AbmiY Kitz DrmvnZ neb|

Avkv Kiv hvq, kyv_xt`iK RxeÁvbi efb cvqMK kvLvq ev`efEK Ávb PPvi gva`tg AvZt cZ`qx I mPZb bMik ntmte Mto ZjtZ GB kyvµg KvKi figKv ivLte |

2. Džik

1. RxeÁvbi aviYv I cila mǫtK Ávb ARb Kiv|
2. Rxei tkYiebvm Kivi Ávb I `ýZv ARb Kiv|
3. Rxe`tni MvibK GKK- tKvIi RxebZĚ mǫtK Ávb ARb Kiv|
4. Rxei wefb ^RebK cμqv i mv_ ciiPZ nIqv Ges G, wji cIZ AbmÜrm I tKšZnjx nIqv|
5. Rxe I ciieþki gþa" cvi"úiiK mǫtK, Gþ` i mgšq I , iZ mǫtK Ávb ARb Kiv Ges evmsvb msiýþYi e"vcþi mþPZb nIqv|
6. Rxechn³ i cþqM mǫtK Ávb ARb Kiv I gþbe Kj"vþY Gi Ae`vb Dcjä Kiv|
7. RxeÁvbi wefb aviYv bxZ, I ZĚmgn, wPÎ, bKkv, mviwY Ges fvIvq cKvþki Ávb I `ýZv ARb Kiv|
8. RxeÁvb PPvi gva"tg e"³, mgvR I gþbe Kj"vþY Ae`vb ivLvi `ýZv ARb Kiv|
9. mgvR I mf"Zvi weKvþk RxeÁvbi Ae`vb Dcjä Kiv|
10. RxeÁvb PPvi AšibwZ tms`h I Avb` Dcjä Kiv Ges Rxei cIZ fvjemv I ggZþeva ^Zvi nIqv|

Aa"vq webv"m I mgq eÈb

beg I `kg tkvYi RxeÁvb weiqU#K wZbU wklb:ý#îi tPšîU Aa"vq mwbtek Kiv n#q#Q| wkyvµtg RxeÁvb weiqi cZU Kv#mi Rb" 50 wqbU mgq eivî ivLvi mcvrik Kiv n#q#Q| mBv#n wZbU Kv#m AbiôZ n#e| nvZÑKjtg `ÿZv Dbq#bi Rb" A_ev , iZcY weiq cW`v#bi Rb" wkyK GKwaK wciqW GKm#_ tbiqvi e"v KiZ cv#ib| Aa"vqfWEK eivîKZ wciqW :

9g tkvY			10g tkvY		
Aa"vq		wciqW	Aa"vq		wciqW
c_g Aa"vq	Rxeb cW	9	beg Aa"vq	`pZv c`vb I Pjb	13
wZxq Aa"vq	Rxe tkvI I wUm"	17	`kg Aa"vq	mgšq	15
ZZxq Aa"vq	tkvI wefvRb	13	GKv`k Aa"vq	R#e cRbb	15
PZ_ Aa"vq	Rxebk ³	15	Øv`k Aa"vq	R#ei eskMz I weeZb	14
cÁg Aa"vq	Lv", ció Ges ciicik	22	Íq#`k Aa"vq	R#ei ciitek	15
Iô Aa"vq	R#e ciienY	30	PZ`k Aa"vq	Rxe chi ³	12
mBg Aa"vq	M'vnxq weibgq	11			
Aóg Aa"vq	†iPb ciµqv	15			

4. w k ŷ v μ g QK

RxeWeÁvb

c_g Aa`vq : Rxeb cW (9 wciqW)

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv	wetkl tJLK wb`kbv
ewxeExq 1. RxeieÁv#bi aviYv e`vL`v Ki#Z cvi#e 2. RxeieÁv#bi carb kvLv, #jv eYbv Ki#Z cvi#e 3. Rxei tkwYieb`v#mi aviYv e`vL`v Ki#Z cvi#e </li> <li>4. Rxei tkwYieb`v#mi c#qvRbxqZv gj`vqb Ki#Z cvi#e </li> <li>5. Rxei tkwYieb`vmKiY c#vZ eYbv Ki#Z cvi#e 6. w0c` bvgKi#Yi aviYv I , i#Z e`vL`v Ki#Z cvi#e </li> </ol> <p><b>Av#eMxq</b></p> <ol style="list-style-type: none"> <li>7. e`eRxe#b Rxei tkwYieb`v#mi c#qvRbxqZv m#ú#K m#PZb n#e	• RxeieÁv#bi aviYv • RxeieÁv#bi kvLvmg#ni cwiwPiZ • tkwYieb`vm <ul style="list-style-type: none"> <li>o aviYv</li> <li>o Rxei tkwYieb`vmKiY c#vZ • w0c` bvgKiY - o aviYv - o , i#Z	• PvU/QK/tiL wP#îi gra`tg RxeieÁv#bi aviYv m#ú#K c#kvÊ#i Av#jvPbv </li> <li>• PvU/Q#Ki gra`tg RxeieÁv#bi kvLvmg#n m#ú#K c#kvÊ#i Av#jvPbv `jMZ KvR</b></p> <p>5 Kingdom kbv<sup>3</sup>KiY</p> <p><b>BwZ:</b></p> <p>tkwYieb`v#mi aviYv I ^eikó" Abhvqx 5 Kingdom kbv³Ki#Yi h_v_Zv wb`kbv:</b> wkýv_x#`i jUwii gra`tg 5wU Kingdom Gi wPî c`vbceK 5wU `#j fVM Kiv n#e	• ^eikó" Abhvqx 5 Kingdom kbv<sup>3</sup>Ki#Yi h_v_Zv	• tkwYieb`vm eYbvi mgq 5 Kingdom c#vZ AbmiY Ki#Z n#e  D`vni#Y wPî m#thvRb Ki#Z n#e • tkwYieb`vmKiY m#µvŠ Activity cV`c`#K _vK#e

«ØZxq Aa'vq : Rxe tKvI I «Um'' (17 «cwiqW)

«kLbdj	«elqe	«kLb tKLv#bv «b#`kbv	gj`vqb «b#`kbv	«etkl tJLK «b#`kbv
«x«E«xq 1. D«™` I c«YtKv#li carb A½vbi KvR e'vL'v Ki#Z cvi#e </p> <p>2. D«™` I c«YtKv#li Zjbv Ki#Z cvi#e 3. `vq, t«k, i³, ZK Ges A«i KvR mðfv#e m«v`#b «efb cKvi tKv#li f«gKv eYbv Ki#Z cvi#e 4. Rxe#`tn tKv#li Dc#h«MZv gj`vqb Ki#Z cvi#e 5. D«™`«Um'' e'vL'v Ki#Z cvi#e 6. c«Y«Um'' e'vL'v Ki#Z cvi#e	- D«™` I c«YtKv#li carb A½vbi KvR (B#j±b gvB#µv`«cK Mvb Abmi#Y) - gvbe#`#ni `vq, t«k, i³, ZK Ges A«i KvR c«iPvjbvq «efb cKvi tKv#li f«gKv - D«™`«Um'' <ul style="list-style-type: none"> <li>o mij «Um'' (c'v#ibKvBgv, tKv#jbKvBgv, t#v#ibKvBgv)</li> <li>o R«Uj «Um'' (RvB#jg I tðv#qg)</li> </ul> </li> <li>c«Y«Um''i KvR <ul style="list-style-type: none"> <li>o AveiYx</li> <li>o thvRK</li> <li>o t«k</li> <li>o `vq	«kÿv_x#`i «`#q tev#W D«™`«Um'' Ges c«Y«Um'' A½b I «P«ýZKiY «b#`kbv : GKRb «kÿv_x GK«U «Um''i «PÎ A½b Ki#e Gici «kÿK chvqµ#g Ab'vb'' «kÿv_x#`i «`#q «P«ýZ Kiv#eb	D«™` I c«Y«Um''i Mvb «P«ýZKi#Y m«VKZv	tKv#li c«_«gK aviYv «kÿv_xiv ceeZx t«Y#Z t#q#Q cecv#Vi chv#jvPbv gjK eYbv «`#q cW i# Ki#Z n#e </li> <li>1 n#Z 3 b«i «kLbdj A«RZ n#j 4b«i «kLbdj A«RZ n#e  G«U c«V`c`#K c_Kfv#e eYbv Kivi c#qvRb t#B  G«el#q Activity t`Iqv th#Z c«i

⚡Zxq Aa`vq : Rxe tKvI I ⚡Um` (17 ⚡c⚡iqW)

Pjgvb 2

⚡kLbdj	⚡elqe	⚡kLb tKLv`bv ⚡b`kbv	gj`vqb ⚡b`kbv	⚡ekI t jLK ⚡b`kbv
7. GKB iKg tKvI mgíoi I GKB KVR mǎúb Kivi ⚡f⚡ĚZ ⚡Um`i KVR gj`vqb KiZ cviŧe 8. ⚡Um`, A½ Ges ZtŠ tKvIi msMVb e`vL`v KiZ cviŧe </p> <p>9. ⚡Um`ZtŠi KVR e`vL`v KiZ cviŧe 10. A½ I A½ZtŠi aviYv Ges ,iZ e`vL`v KiZ cviŧe cixŷv 11. AYexŷY hšši mvrnfh` Dŷ™`tKvI (tcqvR) Ges c⚡YtKvI (tcvUvRvqv) chŧeŷY Kti ⚡PĤ A½b I ⚡PŷZ KiZ cviŧe g#bv#cikR 12. Dŷ™` Ges c⚡Y⚡Um`i ⚡PĤ A½b Kti ⚡PŷZ KiZ cviŧe 13. mVKfvŧe AYexŷY hšš Pvjbv KiZ cviŧe AvŧeMxq 14. Rŧei bvb Kvŧμtg tKvIi Ae`vb cksmv KiZ cviŧe	• ⚡Um`, A½ Ges ZtŠ tKvIi msMVb</li> <li>• ⚡Um`ZŠ Ges Gi KVR • A½ I A½ZtŠi aviYv Ges ,iZ	• ⚡kŷK AbexŷY hšši ⚡efb Asŧki bvg I KVR mǎúŧK AvŧjvPbv Kiŧeb • `jMZ KVR ⚡kŷv_xiv AbexŷY hšši mvrnfh` Dŷ™` (tcqvR) Ges c⚡YtKvI (tcvUvRvqv) chŧeŷYceK ⚡PŷZ ⚡PĤ A½b Kiŧe	• AbexŷYhšši mVK e`envi Ges ⚡PĤ A½b h_v_Zv	• 5 I 6 bǎi ⚡kLbdj AŷRZ nŧj 7bǎi ⚡kLbdj AŷRZ nŧe GŷU cW`c`ŧK c_Kfvŧe eYbv Kivi cŧqvRb tŧB G ⚡elŧq Activity t`Iqv thŧZ cvŧi

ZZxq Aa`vq : tKvI wefvRb

(13 weiqW)

wekLbdj	weIQe	wekLb tkLv`bv web`kbv	gj`vqb web`kbv	wekI t jLK web`kbv
<p>ewxexq</p> 1. tKvI wefvR`bi aviYv e`vL`v KiZ cvi`e 2. tKvI wefvR`bi cKvi`f` eYbv KiZ cvi`e 3. gvB`Uvimm e`vL`v KiZ cvi`e 4. gvB`Uvimm`mi chvqmgn eYbv KiZ cvi`e </li> <li>5. Rxe t`n gvB`Uvimm tKvI wefvR`bi , iZ wekIY KiZ cvi`e </li> <li>6. weg`qwm e`vL`v KiZ cvi`e </li> <li>7. Rbb tKvI Drcv`tb weg`qwm`mi Zvrch e`vL`v KiZ cvi`e </li> </ol> <p><b>Av`teMxq</p> 8. Rxe`bi avivewinKZv iYvq tKvI wefvR`bi Ae`vb Dcj`ä KiZ cvi`e Ges cksmv KiZ cvi`e	• tKvI wefvRb - o aviYv - o cKvi`f` • gvB`Uvimm <ul style="list-style-type: none"> <li>o aviYv</li> <li>o chvq</li> <li>o , iZ</li> </ul> </li> <li>• weg`qwm - o aviYv - o Zvrch	• PvU ev g`W`j i mrvn`h` gvB`Uvimm tKvI wefvR`bi wefb chvq Av`j vPbv  </li> <li>• `jMZ KvR: - tm`Uwigqv`i i Ae`vb Abhvq t`m`gvR`gi wefb AvKvi (V,L,J, I) c`kb </li> <li><b>Bw`Z : gvB`Uvimm (Gbv`dR chvq) web`kbv :</b> wekY`xiv cvKv`bv Dj mZvq wMU t`I qvi gva`tg (wMU`K tm`Ewigqv`i nt`m`te Kíbv K`i) wefb AvKv`i i t`m`gvR`v I tm`Uwigqv`i i Ae`vb c`kb Ki`e	• Gbv`dR `kvq t`m`gvR`v`gi wefb AvKvi c`k`b h_v_Zv	• c_Kfv`te weg`qwm`mi avcmgn e`vL`v Kivi c`qvRb tbB

PZ_ Aa`vq : Rxe`k³ (15 wciqW)

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv	wekl t jLK wb`kbv
<p>eixE`xq</b></p> <ol style="list-style-type: none"> <li>1. tKv`l cavb k³ i Drm wntmte GiUici fvgKv e`vL`v KiZ cvi`te </li> <li>2. mv`jvKms`klY c`muqv kKiv c`Z e`vL`v KiZ cvi`te 3. mv`jvKms`klY tKv`iwdj Ges Av`jvi fvgKv e`vL`v KiZ cvi`te </li> <li>4. mv`jvKms`klY cfve`Ki fvgKv eYbv KiZ cvi`te </li> <li>5. mv`jvKms`klYi Dci Rxei wbfikxjZvi KviY gj`vqb KiZ cvi`te </li> <li>6. kmb e`vL`v KiZ cvi`te 7. mevZ I AevZ km`bi aviYv I , iZ e`vL`v KiZ cvi`te 8. mv`jvKms`klY I km`bi g`a Zjbv KiZ cvi`te </li> </ol> <p><b>cix`y</p> 9. mv`jvKms`klY c`muqv tKv`iwdj I Av`jvi Ac`inhZvi cix`yU KiZ cvi`te 10. kmb c`muqv Zvc wBMg`Yi cix`yU KiZ cvi`te <p>AvteM`xq</b></p> <ol style="list-style-type: none"> <li>11. Rxei Lv` c`Z Dm`ti Ae`vb Dcj`a KiZ Ges Dm`ti ciZ ms`e`bkxj AvPiY KiZ	• Rxe`k³ (Bioenergetics) I GiUici fvgKv</li> <li>• mv`jvKms`klY <ul style="list-style-type: none"> <li>o c`muqv - o tKv`iwdj Ges Av`jvi fvgKv - o Ab`vb` cfve`Ki fvgKv - o , iZ • kmb - o mevZ I AevZ kmb - o , iZ	• `jMZ KvR mv`jvKms`klY c`muqv tKv`iwdj I Av`jvi Ac`inhZvi cix`yU KiZ wb`kbv:</b> wky`xiv `jMZf`te Ute jvM`bv meR cvZv wekó GKU MQ e`envi Kti tKv`iwdj I Av`jvi Ac`inhZvi cix`yU KiZ • `jMZ KvR Dm`ti`i kmb c`muqv Zvc wBMg`Yi cix`yU KiZ wb`kbv :</b> wky`xiv `jMZf`te _v`gvdv, _v`gwgUvi I AsK`iZ tQjv e`envi Kti Zvc wBMg`Yi cix`yU KiZ	• cix`y c`xZ Abmi`Y h_v_Zv  </li> <li>• cix`y c`xZ Abmi`Y h_v_Zv	• Rxe`k<sup>3</sup> I GiUici aviYv w`q tKv`li cavb k<sup>3</sup> mieivnKvix wntmte GiUici fvgKv e`vL`v KiZ nte </li> <li>• mv`jvKms`klYi cv`gK aviYv wky`xiv ceeZx tkY`Z t`c`q`Q  cecv`Vi chv`jvPbv`gjk eYbv w`q mv`jvK ms`klYi ivmvq`bK mgxKiYi e`vL`v Dc`vcb KiZ nte </li> <li>• kmb Gi cv`gK aviYv wky`xiv ceeZx tkY`Z t`c`q`Q  ivmvq`bK mgxKiY e`envi Kti kmb e`vL`v KiZ nte </li> <li>• 5 I 8 b`i wkLbdj GB Aa`vqi Ab`vb` wkLbdj`i gva`tg AwRZ nte  GRb` cW`c`iK weeiY t`lqvi c`q`Rb tbB  Activity t`lqv thZ cvi`

cÂg Aa"vq : Lv`", cŃó Ges cŃicvK

(22 WcWiqW)

[illegible]

cĀg Aa'vq : Lv'', cĭó Ges cĭcĭK (22 wĭiqW)

Pjgĭb 2

wĭLbdj	wĭlqe	wĭLb tĭkLvĭbv wĭb'ĭkbv	gj'vqb wĭb'ĭkbv	wĭkĭ tĭjLK wĭb'ĭkbv
8. cĭó Dcv'vĭb kĭ³ i cĭigY Ges K'vjwĭ I Rĭj Gĭ' i i/cvš i e'vL'v KiĭZ cviĭe	- cĭó Dcv'vĭb kĭ³ (Energy in nutrients) - cĭZ tĭKĭR cĭó Dcv'vĭb kĭ³ i cĭigY - wĭmqKĭg ev Kvh mĭcĭ'ĭb kĭ³ [wĭKĭjvK'vjwĭ Ges wĭKĭjvRj-G]	PĭU/QĭKi mĭnvĭh'' cĭó Dcv'vĭb kĭ³ mĭúĭK AvĭjvPbv		Kvh mĭcĭ'ĭb ejĭZ cĭZ'wĭK wĭfb Kvhμg, tĭRvĭ nvUv, t'šovĭbv, mĭZvi KvUv,kixi PPv, tĭjvajv BZ'wĭ'
9. eĭW gĭm BbĭWK (wĭGgAvB) I eĭW gĭm tĭiĭkD (wĭGgAvi) Gi , iĭZ e'vL'v KiĭZ cviĭe	- wĭGgAvB (BMI) Ges wĭGgAvi (BMR) - iĭZ - wĭnmve - wĭGgAvi Ges e'wqZ kĭ³ i mĭúĭK - wĭGgAvB (eqm I wĭj½)	GKK KĭR wĭGgAvB wĭYq wĭb'ĭkbv : wĭkŷv_xiv Zvĭ' i D'PZv I IRb Abhvqx wĭGgAvB wĭYq Kiĭe	wĭGgAvB wĭYq mĭVKZv	
10. wĭGgAvB I wĭGgAvi Gi wĭnmve KiĭZ cviĭe				
11. wĭGgAvi Ges e'wqZ kĭ³ i mĭúĭK wĭbYq KiĭZ cviĭe				
12. eqm I wĭj½ tĭt' wĭGgAvB wĭnmve KiĭZ cviĭe				
13. m' Rxb hvĭb kixiPPv I wĭekvĭgi , iĭZ e'vL'v KiĭZ cviĭe	kixiPPv Ges wĭekvĭgi , iĭZ			
14. Lv'' msiŷĭY iĭmvqĭbK c'v_e'envĭi cĭqvRbqxZv e'vL'v KiĭZ cviĭe	Lv''e'' msiŷĭY iĭmvqĭbK c'vĭ_i e'envi I Gi kvixiĭK cĭZĭμqv	jMZ KĭR Lv'' iĭmvqĭbK c'v_ I iĀK e'envi mĭμvš wĭfb tĭccvi KĭUs mĭMn Kĭi, wĭR' cĭZĭe'b, KĭUb w'ĭq t' Iqvj cĭĭKv Dc'vcĭ cĭqvRĭb wĭkŷK wĭbĭR I tĭjLv w'ĭq mĭvqZv Kiĭeb	wĭPĭ A¼b I wĭlqe' i Dc'vcĭb h_v_Zv	Lv'' iĭmvqĭbK c'vĭ_i Dc'wĭZRĭbZ kvixiĭK mĭg'm'v mĭó i wĭÁbv fĭĖK eYbv w'ĭZ nĭe
15. Lv'' AvZgwĭvq iĭmvqĭbK c'v_Ges iĀK e'envĭi kvixiĭK cĭZĭμqv wĭkĭY KiĭZ cviĭe	Lv'' iĀK e'envi			

cÂg Aa'vq : Lv'', c'ó Ges c'icvK (22 w'ciqW)

Pjgub 3

w'kLbdj	w'elqe	w'kLb t'kLv'bv w'b'`kbv	gj'vqb w'b'`kbv	w'e'kl t'jLK w'b'`kbv
16. t'c'óKZ'š'i cavb Ask I mnvqZvKvix A½i MVb I KvR eYbv Ki'Z cvi'te	• gvb'tli t'c'óKZ'š'i cavb Ask I mnvqZvKvix A½ Ges Gi KvR : ○ MjvatKiY ○ c'icvK ○ t'kvIY ○ Av'ËKiY ○ w'btmiY	• ewoi KvR t'c'óKZ'š'i cavb As'tki w'Pî A¼b K'ti w'efb Ask w'PîY'ZKiY • `jMZ KvR</b> t'c'óKZ'š'i cavb Askmg'tni KvR <b>B½Z :</b> w'j fv'tii KvR- AM'vk'tqi KvR- <b>w'b'`kbv c'izU `j jUw'ii gva'tg cvß Lv''bvjxi w'efb As'tki KvR w'jL'te	• w'Pî'îi A¼b I w'PîY'ZKiY m'VKZv • t'c'óKZ'š'i cavb As'tki KvR Dc'vc'tb m'VKZv	• Lv't'' imvqibK c`v't_i Dc'w'ZRibZ kvixiK mgm'v m'tói w'eÁvbfi'ËK eYbv w'tZ n'te </li> <li>• Lv't'' iÄK c`v_ e'envt'ii kvixiK w'μqv m'áú'tK msi'yß eYbv w'tZ n'te
17. hK'tZi (Liver) KvR eYbv Ki'Z cvi'te	• hK'tZi (Liver) KvR : ○ c'icvK ○ M'tKvR Ges A'vgvB'tbv Gim'tWi w'ecvK ○ BD'iqv Drcv'b			• 19 b'ai w'kLbd'j i Rb' c'V'c'tK eYbv t' lqv' c'tqvRb t'bB 17 I 18 b'ai w'kLbdj n'tZ G'U AvRZ n'te G msi'kó Activity w'tZ n'te
18. AM'vk'tqi (Pancrease) KvR eYbv Ki'Z cvi'te	• AM'vk'tqi (Pancrease) KvR			
19. Lv'' c'icv'tK Dr'mP'tKi (Engyme) f'igKv gj'vqb Ki'Z cvi'te	• Aw'ŠK mgm'v : ○ ARxYZv ○ Av'gvkq ○ t'KvôKw'Vb'' ○ M'w÷K- Avj'mvi ○ A'v'tcbw'mvB'Um ○ K'igRibZ t'ivM ○ W'qv'iqv	• GKK KvR A'tši mgm'vi KvY, c'izKvi I c'iz'tiva w'j'tL Dc'vc'b w'b'`kbv: w'k'YK c'izU Qv'î'tK 1wU K'ti Aw'ŠK mgm'v w'b'`ó K'ti w'teb w'k'Yv_xiv mgm'vi KvY, c'izKvi I c'iz'tiva m'áú'tK w'jL'te	• A'tši mgm'vi KvY, c'izKvi I c'iz'tiva Dc'vc'tb mnvqZv	
20. A'tši w'efb mgm'vRibZ t'ivM Ges Gi c'iz'tiva I c'izKvi eYbv Ki'Z cvi'te				

Iô Aa'vq : Rte c'ienY (30 wciqW)

wkLbdj	welqe	wkLb tkLv'bv wb'`kbv	gj'vqb wb'`kbv	wetkl t'jLK wb'`kbv
ewxExq 1. DTM c'ienYi aviYv I c'tqRbxqZv e'vL'v KiZ cvi'te 2. DTM I cwbi m'úK e'vL'v KiZ cvi'te 3. DTM cwbi I LwbR c'v' tkvIY c'μqv I Gi c'tqRbxqZv e'vL'v KiZ cvi'te 4. mv'jvK mst'kl'tY d'tj Drcw'Z c'v' i c'ienY eYbv KiZ cvi'te 5. DTM cwbi I LwbR c'v' c'ienY I Gi c'tqRbxqZv e'vL'v KiZ cvi'te 6. c't'`bi aviYv I Zvrch e'vL'v KiZ cvi'te </p> <p>7. c't'`bi nvi wqš'tY cfve'tKi f'gKv w'et'kIY KiZ cvi'te 8. c't'`b GKU AwZc'tqRbxq Ag½j (Transpiration : A necessary Evil) gj'vqb KiZ cvi'te	- DTM c'ienY - aviYv - c'tqRbxqZv - DTM I cwbi m'úK - - BgevBiekb - e'vcb - Awf'eY - cwbi I LwbR c'v' i tkvIY - mv'jvK mst'kl'tY Drcw'Z c'v' i c'ienY - cwbi I LwbR c'v' i c'ienY - c't'`b - aviYv Ges Zvrch - cfveK- Zvcg'v, evq I Av'Zv	`jMZ KvR</b>  <i>Peparomia</i>: DTM w'tq cwbi I LwbR c'v' i c'ienY Av'jvPbv Kiv   Bw½Z: cwbi I LwbR c'v' i c'ienY  wb'`kbv: wk'YK GKRb wk'Yv_x'tK w'tq weKv'ti i cwbt'Z m'v'vbb w'teb H cwbt'Z gjmn m'tZR <i>Peparomia</i> D<sup>TM</sup> ivL'teb Ges K'tqK N'v ci wk'Yv_x't' i Zv ch'teY'Y Kiv'teb Ges D<sup>TM</sup> c'ienYi w'elqvU e'vS'tq w'teb `jMZ KvR</b>  wk'Yv_xiv K'tqKvU `tj w'ef³ n'tq c't'`bi  cix'YvU Ki'te   <b>wb'`kbv : Uemn m'tZR MvQ, t'm'tj v'db e'vM, mZv Ges cwbi m'v'v'h' c't'`bi cix'Yv Ki'te	- cix'Yv c'x'Z Abmi'tY m'v'vKZv - cix'Yv c'x'Z Abmi'tY m'v'vKZv	c't'`b'tK t'Kb AwZc'tqRbxq Ges t'KbBev Ag½j w'nmv'te w'et'ebv Kiv nq Zv 6 I 7 bai wkLbdj n'tZ AwRZ n'te 8 bai wkLbdj hv'vB'tqi Rb Activity t' lqv t'tZ c't'i

wKLbdj	weIqe	wKLb tkLv`bv wb`kbv	gj`vqb wb`kbv	we`kl † jLK wb`kbv												
9. gvbe†`tn msen†bi aviYv e`vL`v Ki†Z cvi†e </div> <div>10. i³ Dcv`v†bi KvR e`vL`v Ki†Z cvi†e 11. wefb M†ci i†³ i `eikó` e`vL`v Ki†Z cvi†e 12. i³ M†c `eik†ó`i Dci wfiE K†i i³ wbevPb Ki†Z cvi†e 13. i³ `v†bi wbgqvewj Ges Gi mvgwRK `vqe×Zv eybv Ki†Z cvi†e 14. gvbe†`tn i³ mÂvj b Kvhmug eybv Ki†Z cvi†e </div> <div>15. ý`wcûi MVb I KvR eybv Ki†Z cvi†e 16. ý`wcû MVbMZfv†e th Gi Kvhmugi mv†_Aif†hwRZ Zv we†kiY Ki†Z cvi†e (Analyze how heart is structurally adapted to its function) 17. i³ mÂvj†b i³ P†ci f†gKv we†kiY Ki†Z cvi†e	- gvbe†`tn msenb</li><li>i†³ i Dcv`vb I KvR - i³ M†ci `eikó` I i³ wbevPb - i³ `vb Ges mvgwRK `vqe×Zv - i³ mÂvj b - o ý`wcûi MVb I KvR - o wkv I agvbi KvR - o i³ P†ci f†gKv	<div> - gvbe †`tni i³ KwYKvi MVb vqx vBW I wP†îi gra†g c`kb I Av†jvPbv GKK KvR c†Z`K wkÿv_x- AvU †ccv†i i³ KwYKvi wPÎ G†K, Gi wb†P msıkó cavb KvRUU wjL†e </li><li><b>`jMZ KvR Kv†m wkÿK KZK g†bwBZ GKUU `j mKj Qv†îi i†³ i M†ci WwUv msMn Ki†e hv e`envi K†i c†Z`K QvÎ Kvî Kvî g†a` i†³ i weibgg Kiv hv†e Zvi ZwjKv ^Zwi Ki†e: Bw½Z: </div> <table><tr><td>Qv†îi bvg</td><td>i³ w`†e</td><td>i³ wb†e</td></tr><tr><td>iv†mj (A)</td><td>gbv (A),cvcb (AB)</td><td>vcb (A),iZb (O)</td></tr><tr><td>X (B)</td><td>?</td><td>?</td></tr><tr><td>Y (AB)</td><td>?</td><td>?</td></tr></table> <div><ul style="list-style-type: none"><li>wkÿK m†e n†j A`wb†gkb wfWl wK†c gybe †`tn ürc†Êi gra†g i³ cevn †`Lv†eb GKK KvR ü`wc†Êi GKUU g†Wj ev wP†î c†Z`K QvÎ i³ cev†ni MwZ wb†`k Ki†e Ges G msμvš wPÎ AvK†e </li><li><b>GKK KvR</b> c†Z`K wkÿv_x ü`wc†Êi wPiýZ wPÎ A¼b Ki†e </div>	Qv†îi bvg	i³ w`†e	i³ wb†e	iv†mj (A)	gbv (A),cvcb (AB)	vcb (A),iZb (O)	X (B)	?	?	Y (AB)	?	?	- KwYKvi MVb I KvR wbY†qi h_v_Zv - M†c Abhvqx i³ Av `vb c`v†bi h_v_Zv - i³ cev†ni MwZ wb†`kbvi mwVKZv - wPÎ A¼†b mwVKZv	- i³ I i³ KwYKv wkÿv_x ceZx †kwY†Z Aa`qb K†i†Q  cecvV chv†jvPbvceK i³ Dcv`v†bi KvR e`vL`v Ki†Z n†e 2 bæi Aa`vq wkÿv_x wUm` I †Kv†li KvR m#ú†K †R†b†Q G Aa`vq 13 I 14 bæi wKLbdj n†Z ý`cw m#ú†K †R†b†Q 16 bæi wKLbdj AR†bi Rb` cw`c`†K †Kv†bv eybv †`evi c†qvRb †bB hvPvB†qi Rb` Activity w`†Z n†e
Qv†îi bvg	i³ w`†e	i³ wb†e														
iv†mj (A)	gbv (A),cvcb (AB)	vcb (A),iZb (O)														
X (B)	?	?														
Y (AB)	?	?														

wkLbdj	welqe	wkLb tkLv#bv wb`kbv	gj`vqb wb`kbv	wetkl t jLK wb`kbv																								
18. Av`k i³Pvc e`vL`v Ki#Z cvi#e	Av`k i³Pvc</li><li>i³Pvc l cvjm#iU Ges G#`i cwigc	GKK KvR i³Pvc gvcvi tKškj AvqE K#i M#tc i³Pvc wbYq K#i Q#K Dc`vcb Ki#e </li></ul> <p>QK :</p> <table><tr><td>wkŷv_xi bvg</td><td>wm#÷vj</td><td>Wwqv#÷vj</td><td>gše`</td></tr><tr><td>i#c</td><td>120</td><td>80</td><td>vfwieK</td></tr><tr><td>x</td><td>?</td><td>?</td><td>?</td></tr><tr><td>Y</td><td>?</td><td>?</td><td>?</td></tr><tr><td>Z</td><td>?</td><td>?</td><td>?</td></tr></table>	wkŷv_xi bvg	wm#÷vj	Wwqv#÷vj	gše`	i#c	120	80	vfwieK	x	?	?	?	Y	?	?	?	Z	?	?	?	i³Pvc wbY#q wbgg Abmi#Yi h_v_Zv					
wkŷv_xi bvg	wm#÷vj	Wwqv#÷vj	gše`																									
i#c	120	80	vfwieK																									
x	?	?	?																									
Y	?	?	?																									
Z	?	?	?																									
19. tKv#j#÷i#ji cKvi#f`, mxgv, DcKwiZv l `v`SñK eYbv Ki#Z cvi#e	- tKv#j#óij - cKvi#f`</li><li>mxgv</li><li>DcKwiZv l `v` SñK	GKK KvR c#Z`K wkŷv_x GK mßv#ni Mn#Z Lv#` tKvjv#÷i j h³ Lvevi Kx Kx Av#Q wbw`ó K#i Dc`vcb Ki#e QK: <table><tr><th>evi</th><th>Mn#Z Lv#`</th><th>tKvjv#÷i j h³ Lv#`</th></tr><tr><td>kıbevi</td><td>fvZ, tQvUgvQ, Lwki gysm, Wvj</td><td>Lwki gysm</td></tr><tr><td>iıeevi</td><td>?</td><td>?</td></tr><tr><td>ımvgevi</td><td>?</td><td>?</td></tr><tr><td>g½jevi</td><td>?</td><td>?</td></tr><tr><td>eaevi</td><td>?</td><td>?</td></tr><tr><td>entevi</td><td>?</td><td>?</td></tr><tr><td>ıııevi</td><td>?</td><td>?</td></tr></table>	evi	Mn#Z Lv#`	tKvjv#÷i j h³ Lv#`	kıbevi	fvZ, tQvUgvQ, Lwki gysm, Wvj	Lwki gysm	iıeevi	?	?	ımvgevi	?	?	g½jevi	?	?	eaevi	?	?	entevi	?	?	ıııevi	?	?	tKv#j#÷i j h³ Lv#` evQvB#qi h_v_Zv	
evi	Mn#Z Lv#`	tKvjv#÷i j h³ Lv#`																										
kıbevi	fvZ, tQvUgvQ, Lwki gysm, Wvj	Lwki gysm																										
iıeevi	?	?																										
ımvgevi	?	?																										
g½jevi	?	?																										
eaevi	?	?																										
entevi	?	?																										
ıııevi	?	?																										
20. i³mÂvj#b tKv#j#÷i#ji fvgKv wetkly Ki#Z cvi#e																												

wkLbdj	welqe	wkLb-†kLv†bv wb†`kbv	gj`vqb wb†`kbv	wetkl †jLK wb†`kbv																		
21. i†³ A¯vfweKZvi (Blood Disorder) KviY I djvdj e`vL`v Ki†Z cvi†e 22. ý`wcÐ maúwKZ †iv†Mi jÿY, KviY, cñZ†iva I cñZKvi wetkIY Ki†Z cvi†e </p> <p>23. ü`wcÔ†K m¯ ivLvi Dcvq wetkIY Ki†Z cvi†e AbmÜvb 24. Dñ™†` c†`†bi cixÿvU Ki†Z cvi†e 25. wekvgiZ Ae¯vq Ges kixiPPvi ci i³Pvc I cvjm†iU cñigvc K†i Ges `B Ae¯v†b cñigvcKZ i³Pvc I cvjm†iU wetkIY Ki†Z cvi†e </p> <p><b>g†bv†cñkR</b></p> <p>26.mñVKfv†e i³Pvc I cvjm†iU cñigvc Ki†Z cvi†e </p> <p><b>Av†eMxq</b></p> <p>27. ý`wcÔ†K m¯ ivLvi Rb` wb†R m†PZb n†e Ges Ab`†K m†PZb Ki†Z cvi†e	- i†³ i A¯vfweKZv - WjD†Kvñgv - ý`wcÊ maúwKZ †ivM<ul style="list-style-type: none"><li>D”P I wba i³Pvc</li><li>evZRI</li><li>nvU GUvK</li></ul></li><li>ý`wcÊ†K m¯ ivLvi Dcvq - mñVK Lv` wbevPb - mñVK Rxebaviv AbmiY	GKK KvR mñVK Rxebaviv AbmiY hvPvBKiy wb†`kbv:</b> oñkýv_x wb†Pi Kvñµg †iKW K†i bai c`vb K†i wb†Ri kvixiK Kvñµg hvPvB Ki†e cñZ†e`b †kñy†Z Dc¯vcb Ki†e  o mñv†ñ KZ w`b 20 wñbU ev Zvi teik mgtqi Rb` kvixiK cñikg Kivi d†j Nñg wbtmZ nq (thgb-jvdvjwñd, RñMs, `zZ mñB†Kj Pvjv†bv BZ`w`) o mñv†ñ KZ w`b 30 wñb†Ui teik kixiPPv ev wetbv`†bi Rb` GK RvqMv †_†K Ab` RvqMvq GKUvbn †`Što nvUv nq ? o mñv†ñ KZ w`b 30 wñb†Ui teik tñvUvñU K†Vvi kvixiK cñikg (thgb- nvjKv fvi enb, mñaviY MñZ†Z mñB†Kj Pvjv†bv A_ev ØZ-e`WwgbÜb †Ljv BZ`w`) Kiv nq hv ü`-ü`b I kvñ-ckv†mi MñZ evovq  Bñ½Z:<table><tr><th>bai</th><th>e`vL`v</th></tr><tr><td>0-4</td><td>wbag††bi kvixiK Kvñµg ü`†ivM nevi mavebv teik </td></tr><tr><td>5-10</td><td>m`v`†i Rb` tñvUvñU h†_ó kvixiK cñikg n†q†Q</td></tr><tr><td>11+</td><td>teik kvixiK cñikg n†q†Q</td></tr></table>	bai	e`vL`v	0-4	wbag††bi kvixiK Kvñµg ü`†ivM nevi mavebv teik	5-10	m`v`†i Rb` tñvUvñU h†_ó kvixiK cñikg n†q†Q	11+	teik kvixiK cñikg n†q†Q	QK: <table><tr><th>µt</th><th>cñB bai</th></tr><tr><td>1</td><td></td></tr><tr><td>2</td><td></td></tr><tr><td>3</td><td></td></tr><tr><td>†gvU</td><td></td></tr></table>	µt	cñB bai	1		2		3		†gvU		ü`wcÔ maúwKZ †iv†Mi KviY eYbvq Zvñv†Ki (wñMv†iU, R`v, mñ`v, , j) c fve Avb†Z n†e
bai	e`vL`v																					
0-4	wbag††bi kvixiK Kvñµg ü`†ivM nevi mavebv teik																					
5-10	m`v`†i Rb` tñvUvñU h†_ó kvixiK cñikg n†q†Q																					
11+	teik kvixiK cñikg n†q†Q																					
µt	cñB bai																					
1																						
2																						
3																						
†gvU																						

mßg Aa'vq : M'vmxq weibgq (11 wciqW)

«kLbdj	«elqe	«kLb tKlvbvb wbt`kbv	gj`vqb wbt`kbv	«etkl tJLK wbt`kbv
ewxexq : 1. Dm'v` M'vmxq weibgqi aviYv e'vL'v KiZ cviTe 2. gvbLi kambZšš cavb Askmgšni KvR e'vL'v KiZ cviTe 3. dmdšmi MVb I KvR eYbv KiZ cviTe 4. gvbLi kv-cvm cµqv I M'vmxq weibgq eYbv KiZ cviTe 5. kambZšš tivMi jÿY, KvY, cizšiva I cizKvšii tKškj e'vL'v KiZ cviTe cixv 6. wbtqvšmi mv_ wBMZ M'všmi cKiz wYq KiZ cviTe (Pšbi cwb cixv) gšbvčikR 7. dmdšmi wPî A½b Kš i wPšyZ KiZ cviTe AvšeMxq 8. kambZšš tivM cizšiva mšPZbZv mš KiZ cviTe	• Dm'v` M'vmxq weibgq • gvb kambZšš cavb Askmgšni dmdšmi MVb • kv-cvm cµqv I M'vmxq weibgq • kvmbvjx msµšš tivM: - o A'vRgv - o esKvBšU - o wBšgwbqv - o h²v - o K'vYvi	• «kYK Kvšm GKU Dm'v`/Dm'v` i wPî Dc'vcb Kš i tKv_vq tKv_vq M'vmxq weibgq nq Zv Qvî/Qvîš i KvšQ RvbšZ Pvlqv gva'g ceÁvb hvPvB Kišeb Ges cieZšZ wbtR Zv e'vL'v Kišeb • «kYK «kYv_xš i cšZ'KšK ešK nvZ tišL jš GKU ckm wbtZ ejšeb Gi Gici wbtkv QvšZ ejšeb, tmB mš_ešKi Dvbwgv jÿ KiZ ejšeb Gici «kYv_xš i ceÁvb hvPvB Kš i kambZšš A½mgn Z_v dmdšmi Ae'vb I MVb e'vL'v Kišeb GšyšI gvbššni enr GKU i wOb wPî Dc'vcšbi gva'g kambZšš Ae'vb wbt`k Kiv tšZ cviTe </li> <li>• <b>ewoi KvR:</b> dmdšmi wPšyZ wPî A½b</li> <li>• <b>GKK KvR</b> «kYv_x dmdšmi A½mgn chvµšg DšjL Kš i mešKšI A'vjwfljvm I i³ i gša' M'vm weibgqi Ae'vb wbt`k Kišeb Bw½Z: • «kyK kambZšš tivMmgn, cizšiva I cizKvšii tKškj AšjvPv Kišeb kvmbvjxi Dci ZvgvK Z_v agcšbi ŸZKi cfve «etkl fvše DšjL Kišeb • `jMZ KvR</b> «kYv_x agcšbi ŸZKi w`K wbtq tKvMb, tcv÷vi, td÷b `Zvi Kš i wewPZ tcv÷vi ev td÷b Kv ev wv'vjšq c`kb Kišeb	• wPî A½šb mšVKZv • M'vmxq weibgq kambZšš wšfb A½ O₂ I CO₂ Gi MšZcš_i w`K wbt`ški h_v_Zv • tKvMb/ tcv÷šii wšlqe' i Dc'vcšb h_v_Zv	• M'vmxq weibgqi tšyšI A'vjwfljvm I i³bvjxi gša' M'vm weibgq Ges i³bvjxi I tKvšIi gša' M'vm weibgq eYbv KiZ cviTe • kvmbvjx msµšš tivM mššZ ZvgvšKi (wMššI, j, mv`v R`v) cfve eYbv KiZ cviTe

Aóg Aa`vq: t̃iPb c̃μqv (15 w̃c̃iqW)

w̃kLbdj	w̃elqe	w̃kLb t̃kLṽbv w̃b̃`kbv	gj`vqb w̃b̃`kbv	w̃ẽk̃l t̃jLK w̃b̃`kbv
ẽw̃ẽx̃q: 1. gvb̃t̃i t̃iPb ẽvL̃v KĩZ cvĩte 2. gvb̃ẽ`tn Drcb t̃iPb c̃`ṽ_i eYbv KĩZ cvĩte 3. ẽt̃° i (Kidney) Mṽb I KṽR eYbv KĩZ cvĩte 4. t̃bd̃t̃bi Mṽb I KṽR eYbv KĩZ cvĩte 5. Am̃t̃gṽi, t̃jk̃t̃b ẽt̃° i f̃igKv ẽvL̃v KĩZ cvĩte 6. ẽt̃° c̃v_i m̃ío c̃iZ̃t̃iva Ges c̃iZKvi eYbv KĩZ cvĩte 7. ẽt̃° w̃eK̃t̃j̃i j̃ỹY I KiYxq eYbv KĩZ cvĩte 8. ẽt̃° i ṽfw̃eK Kṽhμg eRvq ĩvL̃Z W̃qṽj̃vB̃im̃t̃m̃i f̃igKv ẽvL̃v KĩZ cvĩte 9. ẽt̃° c̃iZ̃vcb Ges gĩt̃bṽẼi ẽt̃° ṽt̃bi ãviYv ẽvL̃v KĩZ cvĩte	• gvb̃e t̃iPb • t̃iPb c̃`v_i- ◦ BD̃ĩqv ◦ j̃eY ◦ b̃vB̃t̃Ũt̃Rb ◦ K̃ṽebW̃vB A · ṽBW • ẽt̃° (Kidney)- ◦ Mṽb I KṽR • t̃bd̃b - ◦ Mṽb I KṽR • Am̃t̃gṽi, t̃jk̃t̃b ẽt̃° i f̃igKv • ẽt̃° i m̃gm̃ṽÑ ◦ ẽt̃° c̃v_i- c̃iZKvi ◦ Z̃vr̃ỹw̃YK ẽt̃° w̃eK̃j̃- j̃ỹY I KiYxq ◦ W̃qṽj̃vB̃im̃m ◦ ẽt̃° c̃iZ̃vcb Ges gĩt̃bṽẼi ẽt̃° ṽb	• w̃k̃ỹv_x̃t̃`i ceÁvb h̃iP̃vB K̃t̃i w̃k̃ỹK t̃iPb m̃aú̃t̃K ãviYv w̃`t̃eb • w̃k̃ỹK gvb̃e t̃`tni g̃t̃W̃j̃/w̃P̃Î Dc̃vcb K̃t̃i ẽt̃° i Aẽṽb, Mṽb I KṽR ẽvL̃v Kĩt̃eb </li> <li>• w̃b̃t̃Ri t̃`tn ẽt̃° i Aẽṽb w̃b̃t̃`k KĩZ cvĩte </li> <li>• <b>ẽw̃ĩo KṽR</b> ẽt̃° i w̃P̃ĩỹZ w̃P̃Î Ã¼b </li> <li>• w̃k̃ỹK w̃P̃Î̃i g̃vãt̃g t̃bd̃t̃bi Mṽb ẽvL̃v Kĩt̃eb </li> <li>• <b>GKK KṽR</b> c̃t̃Z̃`K Q̃ṽÎ t̃bd̃t̃bi w̃P̃Î Ã¼b K̃t̃i ĩt̃³ i M̃iZc_ I t̃iPb c̃`ṽ_i cẽṽtni w̃`K w̃P̃Î̃i g̃vãt̃g ẽvL̃v Kĩt̃e B̃ĩ½Z : ĩt̃³ i M̃iZc_ :→ t̃iPb c̃`ṽ_i M̃iZc_ :⇒</li> <li>• <b>GKK KṽR</b> w̃k̃ỹv_x̃iv t̃bd̃t̃bi ÃšM̃ṽt̃bi w̃P̃Î̃ t̃K̃vb t̃K̃vb ṽt̃b c̃ṽib cb:t̃k̃w̃lZ nq Z̃v w̃P̃ĩỹZ Kĩt̃e </li> <li>• <b>ẽw̃ĩo KṽR</b> t̃bd̃t̃bi w̃P̃ĩỹZ w̃P̃Î Ã¼b</li> <li>• <b>`j̃m̃Z KṽR m̃vg̃w̃RK m̃t̃P̃Z̃bZ̃v m̃ío R̃b` gĩt̃bṽẼi ẽt̃° ṽb w̃el̃t̃q t̃cṽ÷vi Ã¼b KĩZ cvĩte	• w̃P̃Î̃i m̃ĩVKZ̃v • M̃iZc_ w̃P̃ĩỹZ K̃ivi h̃_v_Z̃v • ÃšM̃ṽb Kṽt̃Ri m̃ĩVK Aẽṽb w̃bYq KĩZ cvĩv • w̃P̃Î̃i m̃ĩVKZ̃v • t̃cṽ÷ṽi Dc̃w̃cZ w̃el̃t̃q i h̃_v_Z̃v	• GK̃ĩU ẽt̃° w̃`t̃q̃l t̃`tni ṽfw̃eK Kṽhμg eRvq ṽt̃K-GB ãviYw̃U ẽt̃° i Kṽt̃Ri eYbṽi g̃t̃a` Ãšf̃³ KĩZ ñt̃e </li> <li>• gĩt̃bṽẼi ẽt̃° ) `ṽb w̃el̃t̃q m̃vg̃w̃RK m̃t̃P̃Z̃bZ̃v m̃ío w̃el̃q̃ĩU Ãšf̃³ K̃iv h̃vq̃l

†kLbdj	†elqe	†kLb †kLv†bv †b†`kbv	gj`vqb †b†`kbv	†e†kl †jLK †b†`kbv
10. g†bvjxi †ivM Ges m⁻ ivLvi Dcvq eYbv Ki†Z cvi†e AbmÜvb 11. gi†bvËi e° `vb †el†q RbgZ †bi†c†Yi GK†U AbmÜvb KvR Ki†Z cvi†e </p> <p><b>g†bv†c†kR</b></p> <p>12. g†be e° I †bd†bi †P† A¼b K†i †P†yZ Ki†Z cvi†e </p> <p>13. †vgwRK m†PZbZv m†ó† Rb` gi†bvËi e° `vb †el†q †cv÷vi A¼b Ki†Z cvi†e </p> <p>14. e° I g†bvjxi m<sup>-</sup>Zv i†y†q m†PZbZv m†ó† Ki†Z †jd†jU A¼b Ki†Z cvi†e </p> <p><b>Av†eM†xq</b></p> <p>15. e° I g†bvjxi m<sup>-</sup>Zvq m†PZbZv m†ó† Ki†Z cvi†e </p> <p>16. gi†bvËi e° `vb †el†q †vgwRK m†PZbZv m†ó† Ki†Z cvi†e	• g†bvjxi †ivM I m⁻ ivLvi Dcvq	• Avgi†v m†iv†`b †h c†wb LvB, GB c†wb †Kv_vq hvq, Qv†Qv†x†`i Kv†Q †k†yK ck K†i Rvb†Z P†B†eb Ges c†wi†k†l c†qvRb†q- c†wb †`n Kx†v†e c†b†k†l†bi g†v†g a†i iv†L Zv †P††i g†v†g e`vL`v Ki†eb </p> <p>• <b>GKK KvR</b> e° I g†bvjxi m<sup>-</sup>Zv i†y†q m†PZbZv m†ó† Ki†Z †jd†jU A¼b Ki†Z cvi†e </p> <p>• <b>AbmÜvbgjK KvR</b> gi†bvËi e° `vb †el†q RbgZ †bi†c†Y †el†q GK†U c†Z†e`b ^Z†i   <b>B†½Z :</b> e°-Mv† I KvR , e†°† i m†gm`v †b†`kbv :</b> <b>†k†y†_x†v</b> GK†U †b†`ó G†j†K†v gi†bvËi e° `vb †el†q †b†`ó Q†K gZ†vgZ m†m†n Ki†e Ges G†el†q GK†U c†Z†e`b †j†L Rgv †`†e	• †jd†j†U Dc⁻†icZ †elqe⁻i h_v_Zv • c†Z†e`†bi †elqe⁻i Dc⁻vcbvq h_v_Zv	

beg Aa`vq : `pZv c`vb I Pjb (13 wciqW)

wkLbdj	welqe	wkLb tKLv`bv wb`kbv	gj`vqb wb`kbv	we`kl t jLK wb`kbv
eixE`xq</b></p> <p>1. gvbe K¼vj eYbv KiZ cvi`te 2. `pZv c`vb Ges Pj`b K¼vj i fvgKv e`vL`v KiZ cvi`te 3. weifb cKvi A` I A`mÜi KvR e`vL`v KiZ cvi`te </p> <p>4. tci`ki wµqv e`vL`v KiZ cvi`te </p> <p>5. tUbWb Ges wjMtg`Ui KvR e`vL`v KiZ cvi`te </p> <p>6. ImUlci`vmmi KviY, j`yY I ciZKvi eYbv KiZ cvi`te 7. Av_vBü`mi KviY, j`yY I ciZKvi eYbv KiZ cvi`te </p> <p><b>AbmÜvb</b></p> <p>8. ImUlci`vmm I Av_vBü`mi KviY AbmÜvb KiZ cvi`te gbv`c`kR 9. gvbe K¼vj i weifb As`ki wPÎ A¼b K`i wP`yZ KiZ cvi`te Av`teMxq</b></p> <p>10. A` i m`Zv i`y`vq m`PZbZv m`ó KiZ cvi`te	- gvbe K¼vj i mva`iY ciwPiz</li> <li>`pZv c`vb Ges Pj`b K¼vj i fvgKv - A` <ul style="list-style-type: none"> <li>cavb A` - Zi`Yw` - A`mÜ I KvR-mvBb`fqvj A`mÜ</li> </ul> </li> <li>tci`ki wµqv - tUbWb I wjMtg`U</li> <li>ImUlci`vmm - KviY - j`yY</li> <li>ciZKvi</li> </ul> </li> <li>Av_vBü`m - KviY - j`yY - ciZKvi	- wk`yK gvbe K¼vj i GKüU g`Wj ev enr wPÎ Dc`vcb Ki`eb GKK KvR GKRb wk`y_v_x gvbe K¼vj i G`KKüU `vb `úk Ki`e Ges Zvi b`vq e`j t``n Gi c`qvRbxqZv ev fvgKvi K_v tg`LKfv`te ej`te </li> <li><b>GKK KvR</b> t``ni tUbWb I wjMtg`U y`ZM` n`j wk`y_v_xi tKvb tKvb Kv`R mgm`v n`te Zvi GKüU wj` ÷ `Zwi Ki`e	- Dc`wcZ welqe`i h_v_Zv - wj` ÷ `ZwiKi`y h_v_Zv	

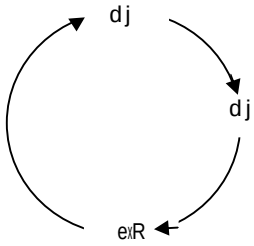
`kg Aa`vq : mgšq (15 vciqW)

¶kLbdj	¶elqe	¶kLb ¶kLv¶bv ¶b¶`kbv	gj`vqb ¶b¶`kbv	¶e¶kl ¶jLK ¶b¶`kbv
e¶xeE¶q 1. D¶¶¶` mgšq e¶vL¶v Ki¶Z cvi¶e 2. cvYxi mgšq c¶¶¶¶ e¶vL¶v Ki¶Z cvi¶e 3. ¶vqZ¶ši cavb Askmg¶ni KvR e¶vL¶v Ki¶Z cvi¶e 4. mvaviY ¶bDi¶bi MVb I KvR e¶vL¶v Ki¶Z cvi¶e	• D¶¶¶` mgšq ◦ e¶x ◦ Pjb • cvYxi mgšq c¶¶¶¶ ◦ ¶vq¶eK ◦ ni¶gvbvj • ¶vqZ¶ši cavb Ask Ges KvR • mvaviY ¶bDi¶bi MVb I KvR • c¶ZeZx c¶Zi¶¶¶¶ • Av¶eM mÂvjb (Impulse Transmission)	• D¶¶¶`i Kv¶Đi Av¶jvi ¶`¶K Mgb ch¶eY¶ ¶b¶`kbv:</b>            ¶k¶YK¶¶i R¶bvjvq Uemn GK¶U D¶¶¶` ¶i¶L ¶`Iq¶            I GK m¶v¶n c¶i ch¶eY¶ Ges ¶elq¶U e¶vL¶v Kiv </li> <li>• D¶¶¶`i g¶ji f-A¶fgLx Pjb ch¶eY¶ ¶b¶`kbv:</b>            K¶qK¶U A¶¶iZ ¶QvjvexR ¶Kv_vI Sij¶q ivL¶e            Ges mgq mgq ex¶R c¶¶b ¶`¶e 2/3 ¶`b ci Zv ch¶eY¶ Kiv Ges djvdj Av¶jvPbv Kiv • GKK KvR ¶bDi¶bi ¶PÎ A¶¶b I ¶PrýZKiY	• ch¶eY¶ ¶_¶K cvß ¶m×vš h¶³mn Dc¶vc¶b h_v_Zv • ch¶eY¶ ¶_¶K cvß ¶m×vš h¶³mn Dc¶vc¶b h_v_Zv • ¶P¶îi m¶VKZv	• ¶vqZš eYbvi mgq mnR¶eva¶ ¶PÎ I ¶dv Pv¶Ui gva¶g m¶v¶ß eYbv ¶`Z n¶e K¶i¶UK ¶vqi eYbvi c¶qvRb ¶bB • ni¶gv¶bi bvg, Drm I KvR QK AvK¶i Dc¶vcb Ki¶Z n¶e

Pj gvb 2

RvZxq 11kÿvµg 2012

GKv`k Aa`vq : Rxe cRbb (15 cxiqW)

⌈kLbdj	⌈elqe	⌈kLb †kLv†bv ⌈b†`kbv	gj`vqb ⌈b†`kbv	⌈e†kl †jLK ⌈b†`kbv
eixēxq 1. Rxe cRb†bi aviYv I , iZ e`vL`v Ki†Z cvi†e 2. cRbb A½ nmv†e d†ji KvR eYbv Ki†Z cvi†e 3. mc@úK D⌈™†`i Rxb P†µi mvmv†h` D⌈™†`i thšb cRbb e`vL`v Ki†Z cvi†e	- Rxei (D⌈™` I cvYx) cRbb- <ul style="list-style-type: none"> <li>aviYv</li> <li>, iZ</li> </ul> </li> <li>D⌈™†`i cRbb A½-dj - mc@úK D⌈™†`i thšb cRbb	`jMZ KvR;</b>  ⌈kŸv_xi ⌈e†fb `j GK⌈U K†i maúY dj (thgb-Rev) Gi ⌈e†fb Ask kbv³ K†i Avjv`v Ki†e Ges GK⌈U K†i AvU †ccvi/mv`v KvM†Ri Dci mv`v †P†Uc ⌈`†q AvU†K†q Askmg†ni b†g I KvR ⌈j†L c`kb Ki†e </li> <li><b>`jMZ KvR; GK⌈U mc@úK D⌈™`, thgb gwiP M†Q†i Rxb P†µi ⌈e†fb avc AvU †ccv†i chvµ†g †c⌈÷s Gi gva††g c`kb Ki†e B†½Z: 	- d†ji Askmg†n Ges Gi KvR ⌈b†`kKi†Yi h_v_Zv - Rxb P†µi ⌈e†fb av†ci h_v_Zv	g†be cRb†bi avcmgn mŸŸß AvK†i eYbv Ki†Z n†e cRbbZ†š†i A½mgn ⌈P††i gva††g Dc`vcb Ki†Z n†e   ⌈e`wiZ eYbv†i c†qvRb †bB

GKv`k Aa'vq : Rxt e cRbb (15 wciqW)

Pj gvb 2

[illegible]

¶kLbdj	¶elqe	¶kLb †kLv†bv ¶b†`kbv	gj`vqb ¶b†`kbv	¶e†kl †jLK ¶b†`kbv
10. gvbe †`†n GBWm Gi msµg†Yi KviY, c¶Z†iva I c¶ZKvi e`vL`v Ki†Z cvi†e </p> <p>11. †`†ni c¶Z†iva e`e`vi Dci GBWm Gi ¶µqv e`vL`v Ki†Z cvi†e g†bv†c¶kR 12. GBWm c¶Z†iv†a †cv÷vi /¶jd†jU A½b K†i m†PZbZv m¶ó Ki†Z cvi†e Av†eMxq 13. GBWm †ivMx†`i c¶Z mnvbf¶Zkxj AvPiY c`kb Ki†e	†`†n GBWm Gi msµgY <ul style="list-style-type: none"> <li>GBWm I †`†ni c¶Z†iva e`e`v	`jMZ KvR</b> ¶ky†Ki mnvqZvq GK¶U ckgvjv ^Z¶i K†i mgeqmx†`i mnvvrKv†ii gva†g Zv ciY Ki†e GBWm Gi m†PZbZv ¶el†q †cv÷vi /¶jd†jU A½b K†i A_ev ¶beÜ iPbv K†i †`qvj c¶ÎKvi gva†g Dc`vcbv	†cv÷vi/¶jd†jU Dc`wcz ¶el†qi m¶VKZv	

Øv`k Aa`vq : R`tei eskM_Z I weeZb (14 wcriqW)

ⱱkLbdj	ⱱelqe	ⱱkLb †kLv†bv ‱b†`kbv	gj`vqb ‱b†`kbv	ⱱe†kl †jLK ‱b†`kbv												
ⱱe×eĖxq 1. eskMⱱZi aviYv e`vL`v Ki†Z cvi†e 2. esk ciⱱúivq PⱱiⱱĖK ^eⱱkó" enbKvix Dcv`vbmgn mⱱú†K eYbv Ki†Z cvi†e </p> <p>3. PⱱiⱱĖK ^eⱱkó" eskciⱱúivq `vbvṣ̌i (replication) e`vL`v Ki†Z cvi†e 4. ⱱWGbG cⱱZi†c e`vL`v Ki†Z cvi†e	- eskMⱱZi aviYv - esk ciⱱúivq PⱱiⱱĖK ^eⱱkó" enbKvix Dcv`vb<ul style="list-style-type: none"><li>†μv†gv†Rvg</li><li>∘ⱱWGbG</li><li>∘AviGbG</li><li>∘ⱱRb</li></ul></li><li>eskMⱱZi Z_` `vbvṣ̌i Ges ⱱWGbG cⱱZi†c (replication)	- ⱱkŷK PvU, ‱P†Ėi mrv†h" eskMⱱZ mⱱú†K Av†jvPbv Ki†eb ⱱkŷv_xiv †gṣ̌LK fv†e eskMⱱZ mⱱú†K c†kvĖi Ki†e GKK KvR ⱱkŷK ⱱWGbG Gi Mvb e`vL`v K†i `jMZfv†e ⱱWGbG g†Wj ^Ẓiⱱi KvR ‱`†eb G†ŷ†Ė c†ei ‱b†`k Abhvq c†Z`K ⱱkŷv_x 2ⱱU †cⱱŶj AvKv†iⱱi KvV, 2ⱱU ‱fb e†Yi 1½gUvi Dj mZv msMn K†i Avb†e ⱱkŷv_xiv ⱱkŷ†Ki mrvqZv ‱b†q 2ⱱU KvVi `B cviṣ̌ mgvṣ̌ivj fv†e mZv †e†a 4/5ⱱU c`v†Pi gva`g ⱱWGbG m†Ėi Mvb c`kb Ki†eb - ⱱkŷK esk ciⱱúivq PⱱiⱱĖK ^eⱱkó" enbKvix Dcv`vbmgn mⱱú†K QK/‱P†Ėi gva`gAv†jvPbv Ki†eb `jMZ KvR</b> cKU † c"Qb ⱱRb ‱PⱱŷZKiY † `vbvṣ̌iY ‱b†`kbv G†ŷ†Ė GKB D†™†`i ‱e†fb AvKvi, AvKiZ † e†Yi-dj, e†R, ciZv BZ`ⱱ` ‱`†q ⱱkŷv_xiv QK ciY Ki†e	- eskMⱱZ mⱱú†K Abave†bi mⱱVKZv - ⱱWGbG m†Ėi g†Wj ^ẒiⱱiKiY † c`kb QK ciY <table><tr><th colspan="3">ⱱRb</th></tr><tr><td></td><td>L</td><td>1</td></tr><tr><td>L</td><td></td><td></td></tr><tr><td>1</td><td></td><td></td></tr></table> *L = jⱱv ^eⱱk†ó"i ⱱRb *1 =Lv†Uv ^eⱱk†ó"i ⱱRb	ⱱRb				L	1	L			1			- eskMⱱZi Z_` `vbvṣ̌i ⱱWGbG cⱱZi†ci (replication) f̣vgKv mnRfv†e AíK_vq Dc`vcb Ki†Z n†e  ⱱWGbG cⱱZi†ci ⱱe`wiZ eYbv † Kvμg ⱱkŷv_xiv Dc†iⱱi †kⱱY†Z Aa`qb Ki†e †qvUmb- ⱱμK Gi ⱱWGbG-i ††ṣ̌ZMVb eYbv Ki†Z n†e
ⱱRb																
	L	1														
L																
1																

Øv`k Aa'vq : Rte i eskMwZ I weeZb (14 wciqW)

Pjgvb 2

ⱱⱱ
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Ø`k Aa`vq : Rxei eskMz I weeZb (14 cwiqW)

Pjgub 3

WkLbdj	Welqe	WkLb tKlv#bv Wb#`kbv	gj`vqb Wb#`kbv	we:kI tJLK Wb#`kbv
8. tR#bUK WmIW#ii KviY I djvdj eYbv KiZ cvi#e	- tR#bUK WmIW#i- - eYvÜZv _`vjvm#gqv	- tR#bUK WmIW#ii KviY I djvdj maú#K IPÎ t`WL#q Av#jvPbv Ki#eb </li> <li>`jMZ KvR - Wkÿv_xiv eYvÜZv I `_vjvm#gqv KviY maú#K `jMZ fv#e WjL#e	eYvÜZv I `_vjvm#gqv KviY kbv³ KiY	
9. weeZ#bi aviYv e`vL`v KiZ cvi#e	- weeZb - RxeRM#Zi WfbZv - AZ`Wak cRb#bi ceYZv</li> <li>Rxei evPvi msMvg</li> <li>cKWMZ WbevPb</li> <li>thvM`Z#gi WU#K _vKv	- WkÿK Wkÿv_x#`i Kv#Q G`Wb#gkb Wdj# c`k#bi gva`tg weeZ#bi 5WU W`K Z#j ai#eb </li> <li>`jMZ KvR - Wkÿv_xiv 5WU `#j Wef<sup>3</sup> ntq weeZ#bi 5WU W`K D`vniYmn tcv#vi tccv#i gva`tg `jMZ fv#e Dc`vcb Ki#e	weeZ#bi 5WU W`K tcv#vi tccv#i Dc`vcb	
10. weeZ#bi cvKWK WbevPb gZev` eYbv KiZ cvi#e				
11. cRvZi WU#K _vKvq weeZ#bi ,iZ we:kIY KiZ cvi#e	cRvZi WU#K _vKvq weeZ#bi ,iZ			
AbmÜvb				
12. gv-evevi mv#_mv`k` I ^emv`k`gjk ^eWkómgv WbYq KiZ cvi#e				
Av#eMxq				
13. Avgv#`i Rxe#b WGbG tU#÷i Ae`vb#K cksmv KiZ cvi#e				

Îtqv`k Aa`vq : Rteî cwi`tek (15 wciqW)

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv	wetki t jLK wb`kbv
eixEiq 1. ev`Zš e`vL`v KiZ cvi`te 2. ev`Zš i Dcv`vbmgti AvštmáK wetkiY KiZ cvi`te </p> <p>3. Lv`k•Lj I Lv`Rvj e`vL`v KiZ cvi`te 4. ev`Zš k<sup>3</sup> i cevn I ció Dcv`vbi máúK Zjbv KiZ cvi`te </p> <p>5. UrdK tjtftj i gta` k³ i máúK Zjbv KiZ cvi`te </p> <p>6. k<sup>3</sup> wciwgWi aviYv e`vL`v KiZ cvi`te	• ev`Zš <ul style="list-style-type: none"> <li>○ aviYv</li> <li>○ Dcv`vb Ges Gt`i máúK</li> </ul> </li> <li>• Lv`k•Lj I Lv`Rvj</li> <li>• ev`Zš k³ i cevn I ció Dcv`vbi máúK</li> <li>• UrdK tjtftj I k<sup>3</sup> i máúK</li> <li>• k<sup>3</sup> wciwgWi aviYv Ges Lv`k Kj mwgZ KiZ Gi cfve	• chēyY ev`Zš i Dcv`vb chēyY ○ ARe Dcv`vb</li> <li>○ `Re Dcv`vb -Drcv`K, Lv`K, wetqvRK</li> </ul> </li> <li>• <b>`jMZ KvR: ev`Zš i Dcv`vb I máúK cevn wPti gva`tg tcv`vbi A½b • PvU I QtKi mwnvth` Lv`k•Lj I Lv`Rvj ctkvEti AvtjvPbv </li> <li>• <b>`jMZ KvR: Lv`k•Lj I Lv`Rvj A½b wb`kbv : wkYK tevW wvfb iKgi D<sup>TM</sup> I cvYxi bvq wjtL wkYv_x`i `tj fvM Kti w`teb cwiU `j tevW wjLZ D<sup>TM</sup> I cvYx w`tq wvfb ai`bi Lv`k•Lj I Lv`Rvj ^Zi Ki`te • Kvfm Dc`wicZ KtqKU Lv`k•Lj k³ AcPti Kg/ teiki wfEtiZ Lv`k•Lj K mvRvte	• ev`ms`vbi Dcv`vb I máúKi Dc`vcbvq h_v_Zv • Lv`k•Lj I Lv`Rvj ^Zi iZ h_v_Zv	

Îtqv`k Aa`vq : Rxei cwi`tek (15 cw`iqW)

Pjgvb 2

¶kLbdj	¶elqe	¶kLb †kLv†bv ¶b†`kbv	gj`vqb ¶b†`kbv	¶e†kl †jLK ¶b†`kbv
7. Lv`¶kKj m¶gZ i¶L†Z k¶<sup>3</sup> ¶ci¶g†Wi cfve e`vL`v Ki†Z cvi†e				
8. Rxe¶e¶P†` Ges Rxe ^e¶P†Î`i cKvi†f` e`vL`v Ki†Z cvi†e	Rxe¶e¶P†` Ges Gi cKvi†f`	`jMZ KvR</b> ¶e¶fba i†bi D¶™` I cvYxi Zv¶jKv ^Z¶i ¶b†`kbv : ¶e`vjq cv½Y/¶bR e¶Mvb/avb†ÿZ/cvU†ÿZ/me¶R e¶Mvb/dje¶Mvb BZ`¶¶` RvqMvq ¶kÿv_xiv `†j f¶M n†q D¶™` I cvYxi Zv¶jKv ^Z¶i Ki†e	¶elqe`i Dc`vc†bi m¶VKZv	
9. e¶Z†ši ¶ZkxjZv iÿvq Rxe¶e¶P†Î`i cfve gj`vqb Ki†Z cvi†e	e¶Z†ši ¶ZkxjZv i¶¶vq Rxe ^e¶P†Î`i cfve	`jMZ KvR</b> cwi†e†k Rxe ^e¶P†Î` Kx cfve co†e h¶` me ZY†fvRx cvYx cwi†ek †_†K Z†j †b¶qv nq  ¶b†`kbv: ¶kÿv_x†`i†K K†qK¶U `†j ¶ef<sup>3</sup> K†i c¶Z¶U `j†K ¶elq¶U ¶`†q †cv÷vi †ccv†i ¶jL†Z n†e	¶elqe`i Dc`vc†bi h_v_Zv	

Îtqv`k Aa`vq : Rteî cwi`tek (15 wciqW)

Pjgvb 3

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv	wetki tjlK wb`kbv
10. cwi`teki fvimg` i`yvq welfb Rteî gta` wg_`tqv I AvštbfikxjZv wetkiY KiZ cvite </p> <p>11. cwi`tek msi`yYi cxwZ e`vL`v KiZ cvite </p> <p>12. cwi`teki fvimg` i`yvi cwi`tek msi`yYi , iZ wetkiY KiZ cvite AbmÜvb 13. GKwU wbeWPZ GjvKvi Drcv`K, Lv`K, wetqvRK Ges tfšZ cwi`teki gta` cvi`ciK macK wbyq KiZ cvite </p> <p>14. GKwU wbw`ó cwi`teki Dcv`vbmgn `wIZ nIqvi KviY wbyq KiZ cvite </p> <p><b>gbv`cikR 15. eišZšš k³ i cevn, Lv`` wkKj I Lv`` Rv`ji cevnPÎ A½b KiZ mÿg nte </p> <p><b>AvteMxq</b></p> <p>16. cwi`teki fvimg` i`yvq e`vZšš Dcv`vbi Ae`vb Dcjwã KiZe Ges Gi msi`yY mPZb nte	• welfb Rteî gta` wg_`tqv, AvštbfikxjZv I cwi`teki fvimg`Zv • cwi`tek msi`yYi cxwZ I , iZ	• `jMZ KvR e`vms`v`b k³ i cevn, Lv``k•Lj I Lv``Rv`ji cevnPÎ A½b </p> <p><b>wb`kbv : cwiZwU `j tcv÷vi tccv`i e`vms`v`b k³ i cevn, Lv``k•Lj I Lv``Rv`ji cevnPÎ A½b KiZe	• tcv÷vi tccv`i A½Z cevn wP`îi h_v_Zv	

PZ`k Aa`vq : Rxe ch³ (12 wciqW)

wkLbdj	welqe	wkLb tkLv`bv wb`kbv	gj`vqb wb`kbv	wetkl t jLK wb`kbv
<p>ewxeE`xq</b></p> <ol style="list-style-type: none"> <li>1. Rxe ch<sup>3</sup> i aviYv I , iZ e`vL`v Ki`Z cvi`te </li> <li>2. wUm` KvjPvi e`vL`v Ki`Z cvi`te 3. km` Drcv`b wUm` KvjPvi i e`envi eYbv Ki`Z cvi`te 4. tR`bUK B`Äbqwis Gi D`I`k` e`vL`v Ki`Z cvi`te </li> <li>5. km` Drcv`b tR`bUK B`Äbqwis Gi e`envi eYbv Ki`Z cvi`te 6. c`ii tivM wbigtq tR`bUK B`Äbqwis Gi e`envi eYbv Ki`Z cvi`te 7. Bbm`jb Ges ni`gub Drcv`b tR`bUK B`Äbqwis Gi e`envi eYbv Ki`Z cvi`te 8. Rxe ch³ i Dc`hwmMZv gj`vqb Ki`Z cvi`te <p>g`bv`c`kR</b></p> <ol style="list-style-type: none"> <li>9. Rxe ch<sup>3</sup> I tR`bUK B`Äbqwis Gi e`envi wel`q tcv`vi A`b Ki`Z cvi`te </li> </ol> <p><b>Av`teM`xq</b></p> <ol style="list-style-type: none"> <li>10. Avgv`i c`Zi`b Rxe`b Rxe ch<sup>3</sup> i Ae`vb Dc`j`x Ki`Z cvi`te	• Rxe ch³ (Biogenetics) ◦ aviYv I , iZ • wUm` KvjPvi Ges Gi e`envi • tR`bUK B`Äbqwis ◦ D`I`k`</li> </ul> </li> <li>• tR`bUK B`Äbqwis Gi e`envi ◦ km` Dbq`b ◦ Mnc`jZ c`ii tivM wbigtq ◦ Bbm`jb I ni`gub Drcv`b	• t`tki tkV`vq tkV`vq wUm` KvjPvi j`ve Av`Q I M`eIYv Pj`Q wk`yK tk`Y`Z D`jLceK G`j`vi mdjZv eYbv Ki`teb </li> <li>• `jMZ KvR Rxe ch<sup>3</sup> I tR`bUK B`Äbqwis Gi e`envi i wel`q tcv`vi A`b • Rxe ch<sup>3</sup> i eZgvb c`qM m`u`KZ g³ Av`jvPbv wb`kbv : wUwgb ÔG`-h<sup>3</sup> tM`i b ivBm, fvBivm-g³ Zjv Pvl BZ`w` wel`q g<sup>3</sup> Av`jvPbv</li> <li>• `jMZ KvR e`sjv`tki Rxe ch<sup>3</sup> I tR`bUK B`Äbqwis wk`yvi m`hwm m`u`KZ c`Zte`b ^Zi wb`kbv: c`ZiU `j wk`y`Ki wb`kbv Abhivx Z`" msMn Ki`te Ges c`Zte`b ^Zi Ki`i Rgv w`te	• tcv`vi i welqe`i Dc`vc`b m`VKZv </li> <li>• Abave`bi h`v`Zv • c`Zte`bi welqe`i m`VKZv	• 1 n`Z 7 bs wkLbdj AR`bi gva`g wk`y`xiv 8bs wkLbdj ARb Ki`te 8bs wkLbdj A`RZ n`q`Q wKbv Zv hvPvB`qi Rb` Dch³ Activity t`lqv th`Z cvi`te

5. $\mathbb{K}^n$ ҰҚ :

- GB QṭK Aaʿvṭqi Rbʰ eivĪ KZ cwiqW msLʼv, wklbdj, welqe⁻ Ges wklbdj fwiĒK weṭki | wbṭ`kbv t̄ lqv AvṬQ hv fvj fvṭe Dc jwā Kṭi wj LṭZ nṭe|
- cwiZU Aaʿvṭqi īi iḡZ (**c_g cvZvq**) ewg cvṭk wkŷvμg QṭK Dṭjw LZ ei×eĒxq (AbmÜvb gjK/cixŷY), gṭbvṭci kR I AvṭeMxq ṯyṭîi wklbdj et· i tf Zi tgvUv **niṭd (Bold)** DṭjL KiṭZ nṭe| Wvb cvṭk wkŷv_xṭ`i cecW/Awf ĀZv Ges ṯPbvRvb/Rxeb Nwbô D`vni Y/Qie w`ṭq 3-5 evṭK`i gṭa` GKwU figKv w`ṭq gj cvṭVi ṯjLv īiḡ KiṭZ nṭe| wkŷv_xṭ`i ce Awf ĀZv/welqe⁻ msikó cṭki gvaṭḡ ṯjLv īiḡ Kiv evĀbxq|
- wkŷvμg QṭK wklbdj ei×eĒxq (AbmÜvb gjK/cixŷYmn), gṭbvṭci kR I AvṭeMxq cwiZU Aaʿvṭqi Rbʰ chvqμḡ DṭjL Kiv nṭqtQ| wKš welqe⁻ Dc⁻vcbv i mgq ei×eĒxq welqe⁻ msikó AbmÜvb gjK/cixŷY, gṭbvṭci kR I AvṭeMxq wklbdj Gi Dc⁻vcbv H ei×eĒxq welqe⁻ Dc⁻vcbv i mvṭ_mḡišZ Kṭi KiṭZ nṭe|
- **cwiZU Aaʿvṭqi Rbʰ eivĪ tgvU wciqṭWi Mto 30 kzsk mgq wkŷv_xi KgKvṭḡi (AbmÜvb gjK KvR/cixŷY BZ`w)` Rbʰ eivĪ _vKṭe|** msikó **wklBkvhμg PjvKvjxb AbmÜvb/cixŷY KvR mawb nṭe|** cixŷY AbmÜvb gjK KvR/cixŷY mgṭq nvṭZ Kjḡg KvRmn wkŷv_xi weifb KgKvṭḡK e· Kṭi w`ṭZ nṭe| cṭhvR` ṯyṭîi KvṭRi wbṭ`kbv I GṭZ \_vKṭe| cixŷY/AbmÜvb gjK KvṭRi mgq [wcwiqṭWi msLʼv] et· DṭjL KiṭZ nṭe| cixŷY/AbmÜvb gjK KvRmgṭn mnRj f` Ges ⁀vbqx fvṭe Kiv hvq Ggb DcKiṭYi e`enviṭK cvaib` w`ṭZ nṭe|
- cwiZU Aaʿvṭqi c_g cōvi Wvb cvṭk welq msikó carb kā (**Key word**) DṭjL KiṭZ nṭe|
- ṯjLKṭK cWwfīĒK cW`c`K wj LṭZ nṭe| Aaʿvṭq Dṭjw LZ cwiqW msLʼvṭK cW msLʼv weṭePbv KiṭZ nṭe| tgvU cVmsLʼv Øviv welqe⁻ṭK Ggbfvṭe web` (mnR ṯ\_ṭK Kwṭbi μgvbmṭi) KiṭZ nṭe thb H wba wi Z cW msLʼv Øviv H Aaʿvṭq Dṭjw LZ welqe⁻ i cW`vb mwVK fvṭe mawb nq Ges wklbdj AwRZ nq| cwiZU Aaʿvṭq wciqṭWi msLʼv Ges Aaʿvṭq ZwiĒK/nvṭZ Kjḡg /e`enwi K/AbmÜvb gjK KvṭRi Rbʰ cṭqvRbxq wciqW weṭePbv Kṭi Aaʿvṭqi cōv msLʼv wba vi Y KiṭZ nṭe| c`v_weÁvb,i mvqb I RxeweÁvb welṭqi cW`c`K cōvi msLʼv nṭe **200 (10% nv m ev ei× nṭZ cvṭi)|**
- cwiZU cvṭK Ggbfvṭe web` KiṭZ nṭe (**wPĪ, Mvd, WuUv, MwYwZK e`vL`v BZ`w)` w`ṭq**) thb wkŷv_xiv mRbkxj, mīókxj Ges wPšb ŷgZv ei×i mṭhvM cvq| wkŷv_xṭ`i cecW/Awf ĀZv Ges ṯPbvRvb/Rxeb Nwbô D`vni Y w`ṭq 3-5 evṭK`i gṭa` GKwU figKv w`ṭq gj cvṭVi ṯjLv īiḡ KiṭZ nṭe| wkŷv_xṭ`i ce Awf ĀZv/welqe⁻ msikó cṭki gvaṭḡ ṯjLv īiḡ Kiv evĀbxq| cvṭVi weifb Asṭk **ck/hμqv Kg/nvṭZ Kjḡg KvR (Activities)** \_vKṭe th, ṯjv Abkxjṭbi gvaṭḡ wklbdj Arb wbiðZ nṭe| D`PZI wKLṭbi (**Higher Learning**) Rbʰ cṭZ`K cvṭVB mṭhvM ivLṭZ nṭe| μqvKgmg nṭZ cvṭi thgb ciZṭe`b `Zwi, mvi mṭṣȳc iPbv, ṯcv÷vi `Zwi Kiv, WBS, mgm`v mgvaib, nvṭZ Kjḡg cixŷY, `jMZ AvṭjvPbv, weZK BZ`w)` | nvṭZ Kjḡg KvRmn wkŷv_xi weifb KgKvṭḡK e· Kṭi w`ṭZ nṭe| cṭhvR` ṯyṭîi KvṭRi wbṭ`kbv I GṭZ \_vKṭe| cixŷY/AbmÜvb gjK KvṭRi mgq [wcwiqṭWi msLʼv] et· DṭjL KiṭZ nṭe| cixŷY/AbmÜvb gjK KvRmgṭn mnRj f` Ges ⁀vbqx fvṭe Kiv hvq Ggb DcKiṭYi e`enviṭK cvaib` w`ṭZ nṭe|
- welqe⁻ i web`vm I Dc⁻vcbv Ggbfvṭe KiṭZ nṭe hvṭZ wkŷv_xiv AvṭeMxq ṯyṭîi wklbdj Arb KiṭZ cvṭi|
- evsjvṭ`ṭki AnaKvsk gva`wgK we``vjṭq beg I `kg ṯkwYi Rbʰ c\_K j`veṭiUi ṯbB| Z`cwi we``vj qmgṭni Aw_K Ae`v mṭšvIRBK bq| we``vj qmgṭni ev`e Ae`v weṭePbvq ṯiṭL nvṭZ Kjḡg KvR wWRvBb KiṭZ nṭe| Kṭi ṯkLv wklbṭK `xN`vqx Ges djcm Kṭi welqwṬK , izZ mnKvṭi weṭePbv KiṭZ nṭe|
- D`vni Y/Qie BZ`w)` i ṯyṭîi ṯRŪvi mgZv eRvq ivLṭZ nṭe|

- MZvbM₁ZK avivq gL⁻ K₁i cix₁Yvq c⁻₁Z tblqv₁ eZg₁v ceYZv₁K m₁óYi₁tc c₁invi Kivi j₁ÿ^{''} eB₁Z mivm₁i ^{''}Z₁i K₁i t^{''}₁Iqv, Q₁K c₁v₁K^{''} ₁j₁L t^{''}₁Iqv ₁Ksev t₁Kvb c₁ki D₁E₁i m₁W₁R₁q t^{''}₁Iqv h₁v₁e b₁v| m₁Á₁v gL⁻ Kivi c₁ie₁Z Dcgv₁-D^{''}₁vni₁t₁Yi g₁va^{''}₁t₁g av₁Yv AR₁t₁bi e^{''}₁e⁻₁v ₁vK₁Z n₁e|
- c₁iZ₁U Aa^{''}₁vq t₁k₁t| **Key Word** ₁f₁i₁É₁K GK₁U m₁vi m₁st₁ÿ₁C (**Recapitulations**) ₁vK₁t₁e|
- c₁iZ₁U Aa^{''}₁vq t₁k₁t| P₁ric₁v₁i g₁t₁a^{''} ₁KQ Abk₁xjbgjK K₁vh₁μ₁g ₁W^{''}₁Z n₁e| Abk₁xjbgjK K₁vh₁μ₁t₁gi D₁t₁Í₁k^{''} P₁P₁v₁i g₁va^{''}₁t₁g ₁kLbdj₁K m^{''}₁pKiY (**Reinforcement**) G₁,₁t₁jvi g₁t₁a^{''} ₁vK₁Z c₁v₁i-
 - o kb^{''}₁v₁b c₁iY
 - o ₁g₁jKiY
 - o ₁W₁f₁b ai₁t₁bi c₁vRj (**Puzzle**)
 - o m₁s₁ÿ₁ß ck
 - o e₁ú₁W₁bevP₁ib ck
 - o mRb₁k₁xj ck
 - o A₁v₁eM₁xq t₁ÿ₁t₁Í₁i ₁kLbdj AR₁t₁bi R₁b^{''} ₁KQ KgK₁Ø
 - o t₁gav₁e₁x ₁k₁ÿ₁v₁ ₁x₁t^{''}₁ i R₁b^{''} ₁KQ m₁ó₁m₁W₁iZ KgK₁Ø (**Extended Activity**)

Abk₁xj₁ K₁vh₁μ₁gmgn t₁hb D^{''}₁PZ₁i ^{''}₁ÿZ₁v (Higher order skill) [t₁hgb ₁W₁e₁t₁k₁IY, m₁st₁k₁IY, Ges gj^{''}₁vqb, mRb₁k₁xj ₁W₁Š₁b (Creative thinking skill) Ges m² ₁W₁Š₁b ^{''}₁ÿZ₁v (Critical thinking skill)] A₁W₁RZ nq Z₁v Aek^{''}₁B ₁W₁b₁ØZ Ki₁t₁Z n₁e|

Av₁gv₁t^{''}₁ i m₁W₁eK j₁ÿ^{''} n₁t^{''}₁Q-

- GK₁U g₁vb₁m₁ó₁Z c₁v^{''}₁c⁻₁K iP₁b₁v Kiv|
- ₁k₁ÿ₁v₁ ₁x₁t^{''}₁ i R₁b^{''} ₁W₁Á₁v₁b ₁k₁ÿ₁v₁t₁K t₁ciY₁vgjK I A₁v₁b^{''}₁ ^{''}₁vqK Kiv|
- ₁k₁ÿ₁v₁ ₁x₁t^{''}₁ i Abm₁iÜrmgbv I t₁KŠ₁Zn₁j₁x Kiv Ges ₁W₁Š₁b ÿ₁gZ₁v m₁ó₁m₁W₁iZ Kiv|
- c₁v^{''}₁c⁻₁K₁t₁K m₁Lc₁v^{''}, m₁nR₁t₁eva^{''} Ges e^{''}₁envh Kiv|
- gL⁻ Kivi ceYZ₁v n₁vm Kiv Ges n₁v₁Z K₁j₁t₁g t₁kL₁v₁t₁K Drm₁W₁nZ Kiv|
- GK₁U **Self Driven** c₁v^{''}₁c⁻₁K iP₁b₁v Kiv t₁hb ₁k₁ÿ₁v₁ ₁xiv b^{''}₁bZg m₁vn₁h^{''} ₁W₁b₁t₁q ₁W₁b₁t₁RivB ₁kLbdj AR₁b Ki₁t₁Z c₁v₁i|



জাতীয় শিক্ষাক্রম ও পাঠ্যপুস্তক বোর্ড, ৬৯-৭০, মতিঝিল বাণিজ্যিক এলাকা, ঢাকা-১০০০