

] gZ YAY Ng ] h] [ ] YO Id<sub>g</sub>ZI[ j h+g O<sub>g</sub>Z h  
 Id<sub>g</sub>ZI[ j +g O<sub>g</sub>Z • / YpE<sub>g</sub> G < j | g < Ok<O h< G Q g<sub>j</sub>kg h  
 Q g<sub>j</sub>kg ] g h h h ZI[ j / 6AAEÄ " AAÄE0qI[ j Qj P<sub>Y</sub>I[ j kgs . khQ[ Q g<sub>j</sub>kg

A: <sub>g</sub>pl NgZ < Y < g QO] kjB ZI hD I[ G pl Y dl G 7 P<sub>j</sub> < g jPl s<sub>g</sub> Y P<sub>j</sub> hdl ENE h jh] NhQK < G  
 X] q YGQ G I h j Pl G d<sub>g</sub>ZI[ j l rdl E gZ < Mgj] P<sub>g</sub>pl < E kG GD Ng jPl s<sub>g</sub> Gk < j <

/ jkG [ jhd < GZ < Mg d dg H [ j < Ql q] gXh] N khQ[ Q g<sub>j</sub>kg ] NPl jql[ j Qj P<sub>g</sub> [ j kgs OPI q] gXh  
 I [ B Z d < h < YO [ g h d g H d] I jg < GQ gZ < [ NE • h kG [ jhq l g < Y l rd] H Gj] ] jPl g < g NgZ h  
 h kP < Z khQ < GpE k < Yg • Q g<sub>j</sub>g j l rj h < g < GQ p < gRkhB [ j l rj h d] YQ < Yh EQY < GEk Ykg Y  
 / jkG [ jh Y < GZ d] g < j P<sub>g</sub>] g < Y pl [ j h QEK QODkj [ ] j YQ Q Gj] OPI . khQ[ . l p] Yj Q[ • j Pl  
 / l B [ G7] gG7 < g jPl ] Y7 < g OPI < g • / j < Q < Q [ • < G + l g h j g < Yh [ ] h •

/ jkG [ jh < Y dkghkl jPl Q [ l g < Y] kjB ZI h j < l GNg < Y Q g<sub>j</sub>kg ] g B kgh h < j h] [ ] YO •  
 Q g<sub>j</sub>kg • < dg GkE] NPl Q < Q < Q [ • Q < pl P<sub>g</sub>Y Ngk[ G g j < GQOPkZ < l rdl gQ [ B h [ j P<sub>g</sub>d < g ] N  
 jPl ] g dg O<sub>g</sub>Z • h kG [ jhd < GQ] g g j] < h h h j Pl h P < dl < Gp < k h NPl Q [ E k Ykg h ]  
 GQ pl g < Yl g < Ql q < sh] NY] XQO < j Pl q] g g Z] Q & Qh Q h Qj] Qh k h NPl gZ < l [ j Q d] g < B  
 < G B [ j l Z d] g g k g O [ Es Z < Gj] GQ QOK QP < G < ddg E g j Pl YQOK QP < GNg < Yh QNQ [ h N  
 Q g g < g .

Q g < GYQ g<sub>j</sub>kg Eg < Y Qj] l r < Z Ql jPl PkZ < B [ GQ [ j Pd kQ p Q l rd Y g q < sh Q q P<sub>g</sub>P Z I < QO Q j l r j k < Y d g

A: 7 Pl g < g jPl h Y < g QO] kjB ZI hdkDQPI G l hdl ENE Y Pl g < g jPl G d<sub>g</sub>ZI[ j 'h Y < g QO  
 l rdl E < Q [ h < E h Q h j] d] j l [ j QYZ < Mgj] [ jPl p QurHv" •

Id<sub>g</sub>ZI[ j q I DQ •

Pj d > q q q • DEI Gk > hEP] ] Yh E h I [ OQ P k[ G g < Gk < j • Pj Z Y  
 GQ Q [ < Y jPl h Y Dkh B [ j < Qh < G j < Q G h < j Z I [ j ] [ jPl Y < g QO] kjB ZI •

A: 2 W H U W D Q \* 3\$ Z KHDWGDW HMLGHQPHLVXHGVRGHMLP LQHZ KHMHUJLDGXDMV KDMHDFKLHMGWKH  
 WDMG RXWMP H / RUVWKGHJUH 7 P<sub>j</sub> l p Q [ B < G < Y < ddg < EPI h G s] k kh j] < h h h q P<sub>g</sub>P  
 ] NPl h kG [ j Y < g QO] kjB ZI h < g D QO < EPQpl GZ] g g Y h q I Y

q CP G j <G G] ZZ I [jh OPI Q <YQj] dg pQ A[ Tr <Z dY ] Nj gZ <Yq gPQO[ Gj] QGEj I j] jPI  
hjkG [j q Pkj Qg f kQ GQ jI gZ h] Nk <Yh OPI g Q <Z Qj gZ <hq I Y<h <NQ <Y r <Z •

Â : KR LQM USUHW KHHMLGHQFH : KDWLW KHSURFH W Y P] Q jPI G d<g Z I [j Qg hd] [ hQY Nj g  
Qj l ggd j QOj PI Gj <G Z <XQOg E Z I [ Gj Q[ hNj gEkgBkYKZ ] g <hQ Z I [j EP <O hQ  
<ddg dgQj I <7 PI [ G I h j Pk] Ekg !

Qj] 0 NkYs Q . khkQ[ / YpEYQ g j kg jI <EP jPI E g E kgh hQ . khkQ[ YQ g j kg • OPI h dg Nkhj g  
<h h j PI ] k j Z I h] NPI @jkG [jh Pk O h <G j] jPI EkgBkYKZ Q E [h kYj Q[ <G Q  
g hd] [ h j] h jkG [j dl gNj gZ <E j PI p <\*Qj Q[ •

Æ : KDWZ HUHMKHDWHP HQWUHWXOWDQGZ KDWKDOQJH/KDWHEHQP DGDV/DUHWXOWRI XVQJ VMLV  
GDW HMLGHQFH 7 Pj q l g jPI Z <Yg <h hZ I [j NQGQO h <pl jPI g D I [ <s g E [j EP <O h j] s kg  
EkgBkYKZ ] ggd Qj <Z < ] q GQj PI <h hZ I [j Gj <E [j gQk jI j] jPI h EP <O h

OPI / / G d<g Z I [j E [ GkEh < [ k <Yg <h hZ I [jh] NQh E g YQ g j kg E kgh h OPI Z ] h j g E [j  
EP <O h Q EKG G < Z dP <h Q ] < Dg <G gg dg h [j <Q[ ] NQ [ g h < G YQ ggs Z ] pl Z I [jh <hq I Y<h  
][ I jPI Q < G Q [ G g QPQ g Qs ] NPI <jk PI g Z < j g QYj <k Qj •

Ç <j I ] NPI Z ] h j g E [j dg Qj Z g pQq • YQ kg Yj I h E Z dg PI [ h Ql G d<g Z I [j <Yh YQ jkG < G  
I r jI g <Yg pQq •

ÃÃÃÃ

] $\text{gZ}$   $\text{YAY}$   $\text{Ng}$   $\text{lhj}][$   $\text{D}\ddot{\text{O}}$   $\text{g}$   $\text{kggkKz}$

I d<g Z | [ j > +g Qg<Z      ↗ j | g • / Yp<sup>CE</sup>²    IgZ ↗ CE / j k GQh  
+g Qg<Z Q QGkGQh

" ] jI • <] Z dY Q [ O ] g Q h q N P j [ E I ] j j P I j k g I Q [ O ÄÄÈÈ> [ O Y ÄÄÄÄ> / ] E s Ä  
< [ O k < O j I P { Q E q Q j Q E N P g h ] N k Y j Y g Q Q F b G Q j • < h j Y g k h Q P d g Q [ O ÄÄÄÄ

Â **<pl NjgZ<Y<g QO>kjþ ZI hNjgPl G d<gZI[j'h]g Þ kgH hDI[ G pl Þdl G 7 Pj <g jPl s>**  
**# Pj hdl ENEHjh] NhXQH<GX]q ÞGO G l hjPl G d<gZI[j l rdl Þ hkJG[jhÞZdÝjQOQh]g**  
**Þ kgH hj] P<pl <E kQ G|**

/jkG [jh] ZdYjQOjPQj kgh q QDI <DY j] Tr<Z QI P] q Qj kdh] N] [j] Zd] ggs Z1gE hG NQI  
↳ GI rdg hkhPl @Q [jQQhjPg kOpjPl kh] Np<gQjQh] N [OQP] ↳ GP] q jPl s lrdYQY] Qk<D  
p<gQjQ [j] g QkY] d] q! gg YQ [h<Eq hD] k [GgQh] Ng<E • l jPl QP] Y E Y] ↳ GEkhP ↳ h h kQOQh  
QEKG jPl [OQP] Ngkgy dd<KEPQ ↳ GjPl \$v<gX!] k [j] QhZQ] Qk<Q p<gQjQ [Q ↳ j] q " l q  
[OQ] G ↳ GQhPQ] gsZ Ql q] Y [OQPZ N] ↳ Y Z1gE 6l q ↳ EK Yg [OQPZ] GY] Qk<Q khl <Z] [O  
" ↳ Q] Z1gE h<G<Z] [Odl] dY qP] Q [jQ] qQP ↳ NEK Yg] ↳ gQk<jlh] NPI Ekhq QY<Y]  
k [G gj] ↳ G] [YQ QOG D] j lh<D] k] Y] Qk<Q 1 [G] Q] g] j ↳ G<D] k] DQDQk<Y] GkEjQ] Q jPl  
E] [j] rj] N] / Y] Qk<Q d] Y] ↳ / jkG [j] Y] ↳ QO] k] Z1h<D] l p<kg] l Gds dj GkEQDQ] kg  
Z1QOZ Y] [QPd<dl ghz<hQOR QGQQk<Y] gYgQ gQj kd dg h] [j] ↳ Q [j] jPl EkhZ] ZdYjQOQ  
] Y] ↳ f kQZ] GQ QON] gZ Q] ↳ GQ] Q] Y] r<Z h]

**ANSWER**

Ä \$jPl gjP< + •q Pqj Gj<>| pG [ 日 Qkh Gj] G j| gZ Ql q Pl jP

OPI QhjgkE] gQ E YKQ gJQ[ qQPjPl E kghl d <EPQO hQd j•Qj l gdg jhQNjgZ <Y pQ[ E Njg  
hjkG [ j <EPQpl ZI [ j QjPl d Gq Z Qh ZI hjl g OPI P<Q] NPl d<gZI [ j d G] jPl gNEkYs  
ZIZDhjl <EPQOQ YQOQgQhhl gpl <E [ hKYdQl d Y d h[ ] G G [ <GGQ[ •hjkG [ j E kghl  
I p<KdQ[ h<g E gQG] kj l pl gs sl <gaj jPl I [ G] NPl hZI hlgZhkZ Z <gQh<g <QEDY j] D jPjPl  
P<Q] NPl d<gZI [ j d Gj] jPl d<gZI [ jh] N [ OQP<G] N] E QYQ[ qPl g jPl E kghl Q  
Eg hYg QdQ d Q OPI QhjgkE] gd j <QhjPl N Y [ jI [ j] NPl E kghl I p<KdQ[ h QEKQDQ[ <ggQ[  
g hd] [ h h] fkl hQ[ hq PQPdg D hkgG [ jh h N p<KdQ[ h] N E kghl Q <Y OPI QhjgkE] gA G0  
ZIIj <Nj gjPl E kghl I p<KdQ[ h<g djkQ l Gj] GQekhjhPl h [ <ggQ[ hQ Q djP

Æ 7 Pj qI g jPl <hh hZI [ j g hKYh d Gq Pj EP< O hPpl Dl [ Z <G <h<g hKY] NkhQOjPQ  
Gj <I pQ[ E Pj qI g jPl Z <Ng<hh hZI [ j NQGQDQ[ <pl jPl g Dl [ <s g E [ j EP< O h] s] kgEkgQkYz] ggd QgZ [ ] q GQjPl <hh hZI [ j Gj <E [ jgQkjI j] jPl h EP< O h

hI hZI [ j NQGQDQhQGQ[ j Gj Pj jPl E kghl IrE l G GjkgG [ jh l rdI E dQ[ h / jkG [ j I p<KdQ[ h YG  
j] hZI Z Q] gEP< O hQ N Ekh d Gd <E •Dk] pl g <Yh kG [ j hQdQhQ[ q <hpI gs PQP<D] kj ÅÅU  
PQPQ[ g jPl <pl g O Njg E kghl hQ jPl ! ] ggQhls] YQ] pl g <Y ! ] g] pl g GgQOjPl ÅÅÅÈ É  
hEP] Ysl <gjPl hsYQdkh] N PQE kghl q <hd pQd GQ E [ hKYdQ[ qQPjPl 1[ QdQdQs] d] ZZQII j]  
g <YQ jPl E kghl E [ jI [ j qQPjPl [ l q QdQdQ] [ ' QdQdQ [ E •kjhQ[ •d GjPl ] ZZ] [ ] G \$[  
jPl D<hQ] NMI CD<EXN Z jPl ] g] ZZQII • Ppl <GG G<E Zd] [ [ j j] jPl E kghl ] Nj N E Q[ ] [  
q Pj QZI d h] Q D s] [ G'YZI g l j] Yg E [ E ' ] NQ[ QdQdQdQ [ E j] jPl Q <Y] NDkQdQO< [ dQ[ <Y  
E [ h [ hkhjPj l rdQ[ Gh E Z Zk [ Qs] q [ l gPQdQ[ GdQdQ E QjQ[ ] NQ[ QdQdQdQ [ E • Y] XNjg <gG  
j] djkQ QOj] jPQEkhQ ÅÅÅÈ

C <I ] NPl Z h j g E [ j dg QgZ g pQq • Yg kgyI h E Zdg Pl [ hQl G d<gZI [ j <Yh N YjkgQZdkQ

] gZ VÄY N|g ] h] [ ] ÄO | d<gZ| [ j h+g Q<Z h  
I d<gZ| [ j>+g Q<Z • <j|g • / VpG•<[ G | gZ<[ / jkGQh  
+g Q<Z Q " I <g <j|g <[ Q<O h<[ G QQQjQ[ h  
" ÆÁÇÂ/\$ 9ÅÅÅÉ <[ Q<Q]

< [ GpII[ < EgP < I ] Y ] Os < [ GI ] P k Ø s f l Ø j Ø I l N jq PR< I I [ E P I Nbg ] j < h k [ " d < s h < [ j g < j p k [ Q Ø Ø s h < Q I Q f k [ Q T N g l k [ d j s O h l g Z l p g Q k [ I " E § X j Ø g k h < [ P ] [ Q [ O < Ø d k [ G Q I E Y Ø k Q ] [ G ] j Ø Ø I Q p D Q ] g F P k Y j k " g

Ã 7 Pl g <g jPl h Y<g [QO] k j Z l hdkDQPI G l hdl ENE Y Pl g <g jPl G d<gZ l [j'h Y<g QO l rdl E<g [h <g hQY j] d] j l [j QYZ <g hP] [jPl q l D] gQ jPl E<g Y O] gQ s] kgG dj Z <g P<g k j h l

I < g [ Q [ G ] k h k g d I Y Y I G ] k ] k @ [ sh P Y < D Q p < Z Q < Y G ] D J K I G J h j < j P I  
D I O Q [ [ Q [ O ] N j i j P l j ] P k D Z R h p < h < [ G G P E Q I h • < [ I G j Y E s k P d Q d R G q Q [ j P I G I d < g j z D P Q j

Ä 2 V<sup>W</sup>KUW<sup>W</sup>DQ\* 3\$ Z KHDWGDW<sup>W</sup>HLGQFH<sup>W</sup>VXHG VR GHM<sup>W</sup>P LQHZ KHM<sup>W</sup>HJUDGXDW<sup>W</sup>KDYHDKL<sup>W</sup>HG W<sup>W</sup>  
W<sup>W</sup>DMG RXW<sup>W</sup>RP HVIRUW<sup>W</sup>HGHJUH<sup>W</sup> 7 P<sup>W</sup>j I p<sup>W</sup>Q [ E<sup>W</sup> G<sup>W</sup> <Y<sup>W</sup>Y<ddg] <EP<sup>W</sup>I hG s] k kh j] <hl hq P<sup>W</sup>Q<sup>W</sup>  
W<sup>W</sup>Q<sup>W</sup> b Q<sup>W</sup> U I

] Z dYj | GDs g[ EX/ <Yz | P• k[ | ÁÁ• ÁÁÁÁ•