

Hi hh`]b[YbYbhXYW_Yb.?i`]bUf]_ \check{z} 5VYbhYiYfibX_i`hi fY``Y'<][\`][\hg

 $9bhXYW_Yb^*G]Y^*X]Y^*j^*YfVcf[YbYb^*GWXAhnY^*Hi^*hh^*]b[Ybg.^*j^cb__i^*]bUf]gWXYb^*<][\^*][\hg^*\varnothing VYf^*U_h]j^*Y^*BUhi^*fYf^*YVb]ggY^*V]g^*\]bni^*\]ghcf]gWXYb^*GY\Ybgk^{\Omega}fX][_Y]hYb^*i^*bX^*VYghYb___lbhYf_\@bZhYb"$



K]`_ca a Yb`]b`Hi hh`]b[YbžY]bYf`W\Ufa UbhYb`GhUXh`]a `<YfnYb j cb`6UXYb!K ØfhhYa VYf[žX]Y`cZh`]a `GW\UhhYb`VY_UbbhYfYf FY]gYn]Y`Y`ghY\h"`8cW\`[YbUi `XUg`a UW\h'Hi hh`]b[Yb`gc ZUgn]b]YfYbX°`<]Yf`Yfk UfhYb`X]W\`b]W\h'bi f`a U`Yf]gW\Y @UbXgW\UZhYb`i bX`Y]bY`fY]W\Y; YgW\]W\hYž'gcbXYfb`Ui W\ j YfVcf[YbY`GW\AhnYžX]Y`XUfUi Z'k UfhYbž'YbhXYW_h'ni `k YfXYb" 9[U`ž'cV`Xi `Y]b`:Y]bgW\a YW_Yf`V]ghž'XYf`X]Y`_i `]bUf]gW\Yb <][\`][\hg`XYf`FY[]cb`Yf_i bXYb`a OW\hYž'Y]b`BUhi fZfYi bXž'XYf U_h]j Y`5VYbhYi Yf`gi W\hž'cXYf`Y]b; YgW\]W\hgYbh\i g]Ughž'XYf`]b X]Y`_i `hi fY``Yb`: UWYhhYb`XYf`GhUXh`Y]bhUi W\Yb`a OW\hY`Hi hh`]b[Yb`\Uh`ZØf`YXYb`Yhk Ug`ni `V]YhYb"`\#b`X]YgYa `5fh]_Y`bY\a Yb`k]f`X]W\a Yb`k]f`X]W\a]h`Ui ZY]bY`FY]gY`ni `XYb`; Y\Y]a b]ggYb`i bX

<][\ `][\ hg'X]YgYf'k i bXYfVUfYb'GhUXh'i bX'[YVYb'X]f'H]ddgž'k]Y'Xi
XY]bYb'5i ZYbh\U`h'i bj Yf[Ygg`]W\'[YghU`hYb'_Ubbgh"'@Ugg'i bg
[Ya Y]bgUa 'X]Y'j YfVcf[YbYb'GW\Uhn_Ua a Yfb'j cb'Hi hh`]b[Yb
Yf_i bXYb°</pre>

JYfVcf[YbY'GWXUhn_Ua a Yfb'jcb'Hi hh`]b[YbYbhXYW_Yb

Hi hh`]b[Ybž'Y]bY'WXUfa UbhY'GhUXh']a 'GØXYb'8Yi hgWX`UbXgž']gh b]WXh'bi f'ZØf']\fY'UhYa VYfUi VYbXYb'@UbXgWXUZhYb'VY_Ubbhž gcbXYfb'V]f[h'Ui WX'Y]bY'J]Y`nU\`'j cb'j YfVcf[YbYb'GWXÀhnYbž'X]YXUfUi Z'k UfhYbž'YbhXYW_h'ni 'k YfXYb"'<]Yf'g]bX'Y]b][Y'XYf'k Yb][YfVY_UbbhYbž'UVYf'UVgc`i h'ZUgn]b]YfYbXYb'CfhYž'X]Y'Yg'ni 'Yf_i bXYb

9]b 5i g[Ub[gdi b_h Z O f = f Y 9f_i b Xi b[]gh X Ug G h U X ha i g Y i a Hi hh]b [Y b " C V k c \ Yg b] W h X Ug [f O h Y A i g Y i a]gh Z Ug n]b Z Ug nb Z Ug

9]b'k Y]hYfYg'j YfghYW_hYg'¾ k Y``]gh'XYf'GhUXhd Uf_'Hi hh`]b[Ybž cZh'j cb'9]b\Y]a]gWXYb'ØVYfgY\Yb"'8]YgYf'_`Y]bY'DUf_']gh'dYfZY_h ZØf'Y]b'fi\][Yg'D]W_b]W_'cXYf'Y]bYb'YbhgdUbbYbXYb'GdUn]Yf[Ub["A]h'gY]bYa 'U`hYb'6Ui a VYghUbXž'_`Y]bYb'HY]WXYb'i bX'V`Ø\YbXYb 6`i a YbVYYhYb'V]YhYh'Yf'Y]bYb'fi\][Yb'FØW_ni [gcfh']a '<YfnYb XYf'GhUXh"

9]b'GdUn]Yf[Ub['Xi fW\X]Y'5 hghUXh'Ybh\Ø``h'nU\`fY]W\Y
j YfghYW_hY'5hhfU_h]cbYb"'<]Yf'Z]bXYb'G]Y'X]Y'a U`Yf]gW\Yb'; UggYb
a]h']\fYb'\]ghcf]gW\Yb'; YVÀi XYb'i bX'_`Y]bYb'7UZÅgž'X]Y'cZh'b]W\h
]a 'FY]gYZØ\fYf'Yfk À\bh'k YfXYb"'8]Y'» hfU» Y'k]fX'[YgÀi a h'j cb
Vi bhYb': UW\k Yf_\Ài gYfbž'X]Y'; YgW\]W\hYb'Ui g'j Yf[Ub[YbYb
\U\f\i bXYfhYb'YfnÀ\`Yb"'5W\hYb'G]Y'Ui Z'X]Y'XYhU]`fY]W\
[YghU`hYhYb': UggUXYbž'X]Y'k i bXYfVUf'Zchc[fUZ]Yfh'k YfXYb
ObbYb°

9]b'ghUf_Yf'<]bk Y]g'Ui Z'X]Y'`c_U`Y'?i `hi f']gh'X]Y'J YgdYf_]fWX Yž X]Y'b]WX h'bi f'Y]b'C fh'XYf'5bXUWX h']ghž'gcbXYfb'Ui WX'ZØf']\fY\Yfn`]WX Y'; Ya Y]bgWX UZh'VY_Ubbh']gh"'8]YgY'?]fWX Y'j YfUbghU`hYh fY[Y`a À»]['?cbnYfhYž'5i gghY``i b[Yb'i bX'UbXYfY'_i `hi fY``Y JYfUbghU`hi b[Ybž'X]Y'Hci f]ghYb'i bX'9]b\Y]a]gWXY ni gUa a YbVf]b[Yb'i bX'X]Y'hc``Y'5ha cgd\ÀfY'j cb'Hi hh`]b[Yb i bYfghfY]WXYb"

: Øf'X]Y'5VYbhYi Yf'i gh][Yb'[]Vh'Yg'X]Y'Fi]bY'XYf'6i f[
< c\Ybhk]Y`ž'bi f'Y]bY'_i fnY'5i hcZU\fh'j cb'Hi hh`]b[Yb'YbhZYfbh''
8]YgY'\]ghcf]gW\Y': Yghi b[gfi]bY'V]YhYh'b]W\h'bi f'Y]bYb'9]bV`]W_']b
X]Y'; YgW\]W\hYž'gcbXYfb'Ui W\'Y]bYb'gdY_hU_i `AfYb'5i gV`]W_'Ui Z
XYb'6cXYbgYY''8Yf'5i Zgh]Y['ni f'6i f[']gh'nk Uf'Yhk Ug
VYgW\k Yf']W\ž'UVYf'X]Y'6Y`c\bi b[']b': cfa 'XYg'DUbcfUa Ug']gh'Yg
Ui Z'YXYb': U``k Yfh"</pre>

9]b'k]W\h][Yg'kY]hYfYg'<][\`][\h']gh'XUg'GW\kÀV]gW\Y'5`d!
A i gYi a ž'XUg'X]Y'fY[]cbU`Y': `cfU'i bX': Ui bU'gck]Y'X]Y
hfUX]h]cbY``Y'@UbXk]fhgW\UZh'nY][h''J]Y`Y'5i gghY``i b[Yb'g]bX
]bhYfU_h]j'[YghU`hYhž'kUg'Yg'dYfZY_h'ZØf'Y]bYb': Ua]`]YbUi gZi[a UW\h'

<]Yf'Y]bY'_i fnY', VYfg]W\h'ØVYf'Y]b][Y'j YfVcf[YbY'GW\\AhnY']b Hi hh`]b[Yb.

| Cfh | 6YgWxfYJVi bl | |
|-------------------------|-------------------------------|--|
| GhUXhaigYia 'Hihh`]b[Yb | 9]bV`]W_Y`]b'; YgW\]W\hY'i bX | |
| | ?i`hifž'\UbXkYf_`]W\Y | |
| | HfUX]h]cbYb | |
| GhUXhdUf_'Hi hh`]b[Yb | Fi\][Yf'Cfh'ZØf'GdUn]Yf[Àb[Y | |
| | | |

 $\begin{tabular}{ll} K Ybb ``G]Y ``U`gc ``U``Ygž'k Ug``Hi hh`]b[Yb'`ni ``V]YhYb``\Uhž'f]W\h][Yf_i bXYb `a `OW\hYbž'gc ``hYb `G]Y `i bVYX]b[h`UVgY]hg`XYf Ui g[YhfYhYbYb `DZUXY `[Y\Yb"`8]Y `j YfVcf[YbYb `GW\A`hnY `X]YgYf GhUXh`k YfXYb `\=\fY`FY]gY `VYfY]W\Yfb `i bX `\=\bYb`i bj Yf[Ygg`]W\Y 9f`YVb]ggY `VYgW\YfYb"`A UW\Yb `G]Y `g]W\`VYfY]hž'X]Y `; Y\Y]a b]ggY j cb ``Hi hh`]b[Yb ``ni `YbhXYW_Yb ``$

?i`]bUf]gW\Y`<Ò\Ydib_hY`XYf`FY[]cb Yf`YVYb

8]Y'FY[]cb'Hi hh`]b[Yb'\Uh'g]W\'U`g'k U\fYg'DUfUX]Yg'ZØf
: Y]bgW\a YW_Yf'YhUV`]Yfh"8]Y'Ui »Yf[Yk Ò\b`]W\Y'J]Y`ZU`h'Ub
fY[]cbU`Yb'GdYn]U`]hÀhYb'i bX'hfUX]h]cbY``Yb'; Yf]W\hYb'a UW\h
YXYb'6Ygi W\'ni 'Y]bYa 'i bj Yf[Ygg`]W\Yb'9f`YVb]g"'Jcb
\Yfn\UZhYb'GdY]gYb'V]g'\]b'ni 'gػYb'@YW_YfY]Yb'[]Vh'Yg']b
Hi hh`]b[Yb'i bX'I a [YVi b['j]Y`'ni 'YbhXYW_Yb"

9]b'<][\`][\h`XYf'_i`]bUf]gWXYb'GnYbY']b'Hi hh`]b[Yb']gh'X]Y'
6cXYbgYY!FY[]cbž'X]Y'b]WXh'bi f'ZØf'gY]bY'UhYa VYfUi VYbXY
@UbXgWXUZhž'gcbXYfb'Ui WX'ZØf'gY]bY'\cWXkYfh][Yb'@YVYbga]hhY`
VY_Ubbh']gh''<]Yf'Z]bXYb'G]Y.

- :]gWX [Yf]WX hY. ": f]gWX Yf":]gWX "Ui g"XYa "6cXYbgYYž ni VYfY]hYh'a]h'`c_U`Yb'?fÀi hYfb'i bX"; Yk ØfnYb"
- CVghi bX; Ya ØgY. ? Ògh`]W.Yf`CVghli bX; Ya ØgYUbVUi ž XYf`fY]W.`]W.`]b`XYb`; Yf]W.hYb`JYfk YbXi b[`Z]bXYh"

 K Y]bY. '8]Y'K Y]b[ØhYf'fi bX'i a 'XYb'6cXYbgYY'V]YhYb Y]bY'J]Y'ZU'h'Ub'fY[]cbU'Yb'K Y]bYbž'X]Y'dYfZY_h'ni 'XYb GdY]qYb'dUqqYb"

9]b'k Y]hYfYg'VYa Yf_Ybgk YfhYg'_i `]bUf]gW\Yg'9f`YVb]g']b Hi hh`]b[Yb'g]bX'X]Y'hmd]gW\Yb'gW\ k $\dot{A}V$]gW\Yb'; Yf]W\ hY"'Ni X]YgYb'[Y\ \dot{O} fYb.

- A Ui `hUgWX Yb. '8]YgY '[YZØ``hYb 'HY][hUgWX Yb 'g]bX 'Y]b A i gg 'ZØf' 'YXYb '6Ygi WX Yf"
- GdÀhn`Y. '8]Y 'hfUX]h]cbY```\UbX[Ya UWXhYb'Bi XY`b'g]bX
 X]Y 'dYfZY_hY '6Y]`U[Y'ni 'j]Y`Yb'; Yf]WXhYb"
- GWX b]hnY`. '8]Y '`YW_YfYbž'dUb]YfhYb 'GWX b]hnY`'_ObbYb ']b nU\`fY]WXYb 'F YghUi fUbhg'a]h'i bhYfgWX]YX`]WXYb '6Y]`U[Yb [YbcggYb'k YfXYb"

Hi hh`]b[Yb']gh'Ui W.'VY_Ubbh'ZØf'gY]bY``c_U`Yb'6fUi YfY]Ybž'X]Y
Y]b'[fc»Yg'Gcfh]a Ybh'Ub'6]YfgcfhYb'UbV]YhYb"'9]b'6Ygi W.']b'Y]bYf
X]YgYf'6fUi YfY]Yb']gh'Y]b'UVgc`i hYg'A i gg"'<]Yf'_ÒbbYb'G]Y'X]Y
?i bgh'XYg'6]YfVfUi Ybg'_YbbYb`YfbYb'i bX'j YfgW.]YXYbY
6]YfgcfhYb'j Yf_cghYb"'9]b][Y'XYf'VY_UbbhYghYb'6fUi YfY]Yb']b'XYf
FY[]cb'q]bX.

- < Ui gVfUi YfY] <]fgWXYb
- I `a '6] $Yf' < \emptyset hhY$
- 6fUi YfY] 9b[Y`

9]b 'k Y]hYfYg' <][\`][\h'g]b X 'X]Y 'n U\`fY]W\Yb '`c_U`Yb 'A Af_hY ž'X]Y fY[Y`a A»]['ghUhhZ]b XYb "'8]YgY 'A Af_hY 'g]b X 'd YfZY_hY 'C fhY ž'i a Zf]gW\Yž'gU]gc b U`Y 'Dfc Xi _hY 'ni '_Ui ZYb 'i b X 'X]Y '\Yfn`]W\Y 5 ha cgd\AfY 'XYf'FY[]cb 'ni '[Yb]Y» Yb "' <]Yf'_ObbYb'G]Y.

- : f]gWkYg'CVgh'i bX'; Ya ØgY'j cb'fY[]cbU`Yb'9fnYi [Yfb dfcV]YfYb
- < Ui g[Ya UW\hY'? ÀgY!'i bX'K i fghk UfYb'YbhXYW_Yb
- @ $YW_YfY]Yb^k]Y^6AW_YfY]Yb^cXYf^gØ_Y^A Ufa Y`UXYb^Z]bXYb$

FYghUi fUbhq'i bX'; Ugh\Ai gYfb'Yf[AbnhžX]Y'hfUX]h]cbY``Y'gck]Y a cXYfbY'?@W\Y'UbV]YhYb"'9]b][Y'Ya dZc\`YbY'FYghUi fUbhg']b Hi hh`]b[Yb'g]bX.

| FYghUi fUbh | | 6YgcbXYf\Y]hYb | |
|-------------|-------------------------|--------------------|--|
| | ; Ugh\Ui gʻni fʻHfUi VY | FY[]cbU`Y`?ØW\Y`]b | |

| ; Ugh\Ui gʻni fʻHfUi VY | FY[]cbU`Y'?ØW\Y']b | |
|-------------------------|-----------------------------------|--|
| | [Ya Øh`]WXYf`5ha cgd\ÀfY | |
| FYghUi fUbh FUVYb | ?fYUh]j Y'; Yf]W\hY'a]h'Zf]gW\Yb | |
| | Ni hUhYb | |
| G]b[YbXYf'K]fh | l bhYf\U`hi b['i bX '`YW_YfYg | |
| | 9ggYb | |

8 Ug i `]bUf]gW\Y '9f`YVb]g]b 'Hi hh`]b[Yb 'k]fX 'Xi fW\ 'nU\ `fY]W\Y JYfUbghU`hi b[Yb'i bX': Ygh]j U`g'VYfY]WXYfhž'VY]'XYbYb'`c_U`Y ? Ogh`]WX Y]hYb`]a 'A]hhY`di b h`ghY\Yb"'6YgcbXYfg`Ya dZY\`Ybgk Yfh g]bX.

- 8 Ug Hi hh`]b[Yf; ci fa Yh!: Ygh]j U`. 9]b 9j Ybhž XUg `c U`Y`7\YZa'dfÀgYbh]Yfh'i bX'Yl ei]g]hY'GdY]gYb'gYfj]Yfh"
- 8 | Y 'g W k À V | g W Y '? Ufhc ZZY `k c W Y . '9 | b Y ': Y | Y f X Y f ? Ufhc $\mathbb{Z}Y$ ` \check{z} `X]Y ' $\overset{\triangle}{\to}$ b Y b ' $\overset{\triangle}{\to}$ b Y b ' $\overset{\triangle}{\to}$]Y ` $\overset{\triangle}{\to}$ The following formula () Y ' $\overset{\triangle}{\to}$ The f
- K Y]bZYghY. '9bhXYW_Yb'G]Y'X]Y'VYghYb'K Y]bY'XYf'FY[]cb ibX ca V]b]YfYb G]Y X]YgY a]h c U Yb 8 Y] UhYggYb"

Ni gÀhn`]WX ni 'XYb ZUbhUgh]gWXYb 'GdY]gYb '[]Vh'Yg]b 'Hi hh`]b[Yb Y]bY'J]Y`nU\``; cb'K Y]b!'i bX'6]Yf; Yf_cghi b[Ybž'X]Y'Y]bY'hc``Y $; Y^Y[YbY]h^V]YhYbž^X]Y^c_U^Yb^5fca Yb^_YbbYbni ^YfbYb"^J]Y^Y$ $K Y]b[\emptyset h Y f'i b X 6 f U i Y f Y] Y b V] Y h Y b [Y Z \emptyset \ f h Y 'H c i f Y b 'U b ž X] Y 'X Y b$ 6Ygi W\Yfb'9]bV`]W_Y']b'X]Y'DfcXi _h]cbgdfcnYggY'[Yk À\fYb'i bX _Ògh`]WXY DfcVYb VYfY]h\U`hYb"

K Ybb 'G]Y 'Ui Z'XYf 'Gi W\Y 'bUW\ 'Y]bYa 'Y]bn][Ufh][Yb '_i `]bUf]gW\Yb $5VYbhYiYf'g]bXž'XUbb'gc``hYb'G]Y'Hihh`]b[Yb'ibVYX]b[h'UiZ' \Rightarrow fY$ FY]qY`]qhY`qYhnYb"'9[U`ž'cV'G]Y'Y]b': Y]bgWXa YW_Yfž'Y]b K Y]b`]YV\UVYf`cXYf`Y]bZUW\`bi f`bYi []Yf]['Ui Z'bYi Y ; $YgWa UW_gYfYVb]ggYg]bX$ "Hi hh`]b[Yb'V]YhYh' \Rightarrow bYb'Y]bY fY]WX\U`h][Y'i bX'_Ògh`]WXY'FY]gY'Xi fWX'X]Y'5fca Yb'XYf'FY[]cb"

5_h]j Y 5 V Y b h Y i Y f '] b 'X Y f 'B U h i f 'j c b H i h h `] b [Y b

Hi hh`]b[YbžY]b[YVYhhYh`]b`X]Y`a U`Yf]gWXY`@UbXgWXUZh`6UXYb!

K ØfhhYa VYf[gž']gh`Y]b`k U\fYg`DUfUX]Yg`ZØf`BUhi f`]YV\UVYf`i bX

5_h]j i f`Ui VYf"`8]Y`FY[]cb`V]YhYh`Y]bY`J]Y`nU\``j cb`A Ò[`]WX_Y]hYbž
i a `X]Y`Zf]gWXY`@ Zh`i bX`X]Y`UhYa VYfUi VYbXY`BUhi f`ni `[Yb]Y»Yb"

J cb`\Yff`]WXYb`K UbXYfi b[Yb`ØVYf`FUXhci fYb`V]g`\]b`ni

K UggYfgdcfhUfhYb`Ua `bU\Y[Y`Y[YbYb`6cXYbgYY``\]Yf`]gh`ZØf

YXYb`Yhk Ug`XUVY]"

6Y[]bbYb'k]f'a]h'XYb'K UbXYfib[Yb"8]Y'ia`]Y[YbXYb'KÀ`XYfibX'<Ø[Y```UXYb'G]Y'Y]bž'ibjYf[Ygg`]WXY'K UbXYfYf`YVb]ggY'niYf`YVYb"'9]b'VY`]YVhYf'K UbXYfkY[']gh'XYf'GWXk Ufnk U'X!

< O\YbkY[ž'XYf'gdY_hU_i`AfY'5igV`]W_Y'UiZ'X]Y'@UbXgWXUZh'V]YhYh''8]Y'aUf_]YfhYb'FcihYb'g]bX'ZØf'jYfgWX]YXYbY':]hbYgg`YjY`
[YY][bYh'ibX'ZØ\fYb'jcfVY]'Ub'\]ghcf]gWXYb'GhÀhhYb'gck]Y
jYfghYW_hYb'5igg]WX hgdib_hYb"

<]Yf g]b X Y]b][Y Ya dZY Ybgk YfhY K UbXYfk Y[Y.

- FibXkY['ia'XYb'GhUXhgYY
- < c YbghY]b!FibXkY[
- \bullet 8 Y f 'Hi hh`]b[Y f '5 i gg]W hgd i b_h

: Øf F UXZU\fYf`\Uh'Hi hh`]b[Yb YVYbZU``g'j]Y``ni 'V]YhYb"'8]Y F Y[]cb]gh'Xi fW\'Y]b'[i h'Ui g[YVUi hYg'BYhnk Yf_'j cb F UXk Y[Yb[Y_YbbnY]W\bYhž'X]Y'X]Y GW\Ob\Y]h'XYf'i a `]Y[YbXYb'@UbXgW\UZh\Yfj cf\YVYb"'6YgcbXYfg'Yfk À\bYbgk Yfh']gh'XYf'8cbUi !F UXk Y[žXYf'Ybh`Ub['XYg': `i ggYg'j Yf`Ài Zh'i bX'k i bXYfVUfY'Ghcddg']bW\Ufa UbhYb'8OfZYfb'Yfa Oj[`]W\h"

H]ddg'ZØf'FUXhcifYb.

- 6f]b[Yb'G]Y'Ui gfY]WXYbX'K UggYf'i bX'GbUW_g'a]hž'i a
 i bhYfk Y[g'9bYf[]Y'ni 'hUb_Yb"
- Bi hnYb'G]Y'X]Y'FUXj Yf`Y]\!GhUh]cbYb']b'Hi hh`]b[Ybži a 'Y]b
 [YY][bYhYg': U\ffUX'ni 'Z]bXYb"

D`UbYb'G]Y'DUi gYb'Ub'XYb'j]Y`Yb'fi \][Yb'D`ÀhnYb'Ybh`Ub[XYg'K Y[Yg'Y]b"

5 VY f'X Ua]h'b]W\h'[Ybi ['''ZØf'X]Y'5 VYbhYi Yf'i gh][Yb'i bhYf'\Rightarrow bYb []Vh'Yg'Ui W\'X]Y'A $O[`]WX_Y]h'XYg'?`YhhYfbg'i bX'6Yf[ghY][Ybg'' 8]Y': Y`gYb'XYg'< c\Yb\Yk Yb'i bX'X]Y'fY]nj c``Y'I a [YVi b['V]YhYb gck c\``5bZ\hb[Yfb'U`g'Ui W\'YfZU\fYbYb'?`YhhYfYfb'[YY][bYhY Fci hYb'''?`YhhYfdUf_g'k]Y'XYf'?`YhhYfdUf_'Hfcgg]b[Yb'g]bX'Y]bYZUbhUgh]gW\Y'A <math>O[`]WX_Y]h\check{z}g]WX']b'XYb'6Ui a _fcbYb'Ui gni hcVYb''$

?Ubi!ibX`?U'U hcifYb

Hi hh`]b[Yb``]Y[h']b`XYfBÀ\Y`XYg`6cXYbgYYgžk Ug`Yg`]XYU``ZØf K UggYfgdcfhUfhYb`a UW\h"`?Ubi!'i bX`?U^U_hci fYb`[Y\ÒfYb`ni `XYb VY`]YVhYghYb`5_h]j]hÀhYbžVYgcbXYfg`Ub`k Ufa Yb`Gca a YfhU[Yb" A]YhYb`G]Y`Y]b`?U^U_`cXYf`bY\a Yb`G]Y`Ub`Y]bYf`[YZØ\fhYb`Hci f hY]`ži a `X]Y`I a [YVi b['j ca 'K UggYf`Ui g`ni 'Yf_i bXYb"`8]Y 5i gg]W\h`Ui Z`X]Y`5`dYb`]a '<]bhYf[fi bX`]gh`UhYa VYfUi VYbX`i bX a UW\h`XUg`9f`YVb]g`i bj Yf[Ygg`]W\"

K]`X`]ZY BUhi f`Yf`YVYb

8]Y FY[]cb V]YhYh Ui g[YnY]W bYhY A Ò[`]W _Y]hYbžX]Y ``c_U`Y : `cfU i bX : Ui bU ni `YbhXYW_Yb" CV VY]a `Jc[Y`VYcVUW hYb ']b XYb BUhi fgW i hn[YV]YhYb 'cXYf VY] [YZØ\fhYb 'Hci fYb 'Xi fW X]Y K UW \c`XYf\Y]XYbžX]Y `GW Òb\Y]h XYf BUhi fj cb 'Hi hh`]b[Yb ']gh ZUgn]b]YfYbX" '6Y[Y[bi b[Yb 'a]h 'H]YfYb 'k]Y FY\Yb 'cXYf j YfgW]YXYbYb 'Jc[Y`UfhYb 'g]bX 'Xi fW Ui g 'a Ò[`]W "

9j Ybhg i b X 5_h]j]hÀhYb]a : fY]Yb

a '@Ui ZY'XYg'≯J\fYg'k YfXYb'nU\`fY]WXY'J YfUbghU`hi b[Yb']b'XYf BUhi f'cf[Ub]g]Yfhž'XUfi bhYf'J c`_g`Ài ZYž'Ci hXccf!: YghY'i bX'gc[Uf?i bgh]bghU``Uh]cbYb']b'XYf'ZfY]Yb'BUhi f"'8]YgY'; Y`Y[Yb\Y]hYb V]YhYb'b]WXh'bi f'Gdcfh!'i bX': fY]nY]hU_h]j]hÀhYbž'gcbXYfb'Ui WX'X]Y 7\UbWYž'X]Y'; Ya Y]bgWXUZh'ni 'Yf`YVYb'i bX'bYi Y': fYi bXY'ni Z|bXYb"

 $C\ V'G]Y'Y]bY'YbhgdUbbYbXY'K UbXYfi b['a UWXYbž'a]h'XYa : U\ ffUX'X]Y'I a [YVi b['Yf_i bXYb'cXYf'U_h]j ']a 'K UggYf i bhYfk Y[g'g]bX' 'Hi hh']b[Yb']gh'k]f_`]WX'Y]b'C fhž'XYf'U``Y'5fhYb j cb'U_h]j Yb'5VYbhYi Yfb']b'XYf'BUhi f'V]YhYh'''DUW_Yb'G]Y'\$fY K UbXYfgWXi \Y'Y]b'i bX'[Yb]Y\$Yb'G]Y'X]Y'\Yff`]WXYb A <math>O(`)W_Y$ hYbž'X]Y'X]YgY'k i bXYfVUfY'FY[]cb'ni 'V]YhYb'\Uh'

<]ghcf]gW\Y`GY\Ybgk ØfX][_Y]hYb`i bX _i `hi fY``Y`<][\`][\ hg</pre>

Hi hh`]b[YbžY]bY`W\Ufa UbhY`GhUXh`]b`6UXYb!K ØfhhYa VYf[žV]YhYh
Y]bY`fY]W\Y`; YgW\]W\hY`i bX`Y]bY`J]Y`nU\``j cb`_i `hi fY``Yb
<][\`][\hgžX]Y`6Ygi W\Yf`]b`]\fYb`6Ubb`n]Y\Yb"`Jcb
VYY]bXfi W_YbXYb`6Ui k Yf_Yb`V]g`\]b`ni `_`Y]bYbž`UVYf`ZY]bYb
A i gYYbž`X]Y`GhUXh`\Uh`ZØf`YXYb`Yhk Ug`ni `V]YhYb"

6Y[]bbYb'k]f'a]h'XYa'GhUXhaigYia'Hihh`]b[YbžY]bYak U\fYb'GW\Uhn'ZØf'; YgW\]W\hg]bhYfYgg]YfhY'''<]Yf'_ÒbbYb'G]Y'X]Y
9bhk]W_`ib['XYf'GhUXh'jcb'XYf'5bh]_Y'V]g'nif'AcXYfbY'Yf_ibXYb''
8]Y'5igghY``ib[Yb'VY\YfVYf[Yb'Y]bY'J]Y`nU\`'jcb'5fhYZU_hYbž
XUfibhYf'\]ghcf]gW\Y'8c_iaYbhYž'AÒVY``ibX'?ibghkYf_Y''
6YgcbXYfg'VYaYf_YbgkYfh']gh'X]Y'5VhY]`ib['nif'AYX]n]bhYW\b]_ž
X]Y'X]Y'`Ub[Y'HfUX]h]cb'Hihh`]b[Ybg'U`g'NYbhfia'X]YgYf'6fUbW\Y

9]b'k Y]hYfYg'ZUgn]b]YfYbXYg'N]Y``]gh'X]Y'Gh"; U``i g!?]fWX Yž'X]Y']a%, "''\J\f\i bXYfh']a 'VUfcW_Yb'Gh]``YfVUi h'k i fXY"'A]h']\fYb VYY]bXfi W_YbXYb': fYg_Yb'i bX'Y]bYf'k i bXYfgWX ObYb'Cf[Y``]gh X]Y'?]fWXY'b]WX h'bi f'Y]b'Cfh'XYg'; chhYgX]YbghYgž'gcbXYfb'Ui WX Y]b'VY`]YVhYg'N]Y``ZØf'?i bghUi gghY``i b[Yb'i bX'?cbnYfhY"'8]Y 5ha cgd\AfY'X]YgYf'?]fWXYž'i a [YVYb'j cb'U`hYb'6Ai a Yb'i bX Y]bYa 'gUZh]['[fØbYb'; UfhYbž'`AXh'XUni 'Y]bž'Y]bYb'A ca Ybh'XYf Fi\Y'i bX'6Yg]bbi b['ni '[Yb]Y*Yb"

B]W\h'k Y]h'j cb'XYf'Gh"; U``i g!?]fW\Y'YbhZYfbh'VYZ]bXYh'g]W\'XUg' 5`hY'F Uh\ Ui gž'Y]b'k Y]hYfYg'\]ghcf]gW\Yg'\\ k Y``XYf'GhUXh"'5b X]YgYa '; YV\Ai XY'_Ubb'a Ub'XYb'K UbXY``XYf'5fW\]hY_hi f'\ØVYf'X]Y \U\f\i bXYfhY'\]bk Y['bUW\j c``n]Y\Yb"'8 Ug'F Uh\Ui g'VYg]hnh'Y]bYb a Uf_UbhYb'Hi fa 'i bX']gh'cZh'Y]b'5b`Ui Zdi b_h'ZØf'GhUXhfi bX[Àb[YžX]Y'X]Y'ZUgn]b]YfYbXY'; YgWX]WXhY'XYf'GhUXh'`YVYbX]['k YfXYb`UggYb"

9]b 'V Ygcb X Yf Yg' <][\ `][\ h']b 'Hi hh`]b [Yb']gh' X Ug' F \bullet a Yf V U X ž' Y]b Zf Y] ']W h`]W Yg' A i gYi a ž' X Ug' X]Y', V Yf f Ygh Y' Y]b Yg' f \bullet a]g W Yb' 6 U X Yg n Y][hž' X Ug' Yhk U' & \$\$\$ '\delta \] f Y' U 'h']gh'' <]Yf' _\overline b Yb' 6 Ygi W Yf' Y]b Yb 9]b V`]\W_']b 'X Ug' \@Y V Yb' i b X' X]Y'? i 'hi f' X Yf' F \bullet a Yf' [Yk]b b Yb ž' X]Y Y]b gh' X]Y gY' F Y[]cb' V Yg]Y X Y' h Yb'' 8]Y' [i h' Yf \ U' h Yb Yb' F i]b Yb' g]b X b]W h' b i f' \]ghc f]g W 'V Y X Yi h Yb X ž' gc b X Yf b' V]Yh Yb' Ui W 'Y]b Yb V YY]b X fi \ \W_Y b X Y b' 6`]\W_' Ui Z' X]Y' \delta [Yb]Yi fg_i bgh' X Yf' X Ua U`][Yb N Y]h''

 $: \emptyset f ? i bgh`]YV\UVYf`]gh'X]Y`; U`Yf]Y`]a `5`hYb`?`cghYf`Y]b`A i gg'' <]Yf`k YfXYb`fY[Y`a Å»][`k YW\gY`bXY`5i gghY``i b[Yb`j cb``c_U`Yb i bX`]bhYfbUh]cbU`Yb`? \Øbgh`Yfb`dfÅgYbh]Yfh''8]Y`F Åi a `]W_Y]hYb gY`Vgh'g]bX`YVYbgc`VYY]bXfi \W_YbX`i bX`j Yf`Y]\Yb`XYb ?i bghk Yf_Yb`Y]bYb`VYgcbXYfYb`FU\a Yb''8]Y`?ca V]bUh]cb`Ui g \]ghcf]gW\Yf`5fW\]hY_hi f`i bX`a cXYfbYf`?i bgh`gcf[h`Z\Øf`Y]b Y]bn][Ufh][Yg`9f`YVb]g''$

Ni gàhn`]WX 'ni f'5fWX]hY_hi f'i bX'XYb'A i gYYb'gd]Y`h'Ui WX 'XUg' ?i `hi f`YVYb'Hi hh`]b[Ybg'Y]bY'[fc»Y'Fc``Y"'8]Y'GhUXh cf[Ub]g]Yfh'XUg'[UbnY'&U\f'ØVYf'j YfgWX]YXYbY'JYfUbghU`hi b[Ybž XUfi bhYf.

- 8 UgʻHi hh`]b[YfʻGhUXhZYghʻ 'Y]bʻZUfVYbZfc\Ygʻ9jYbh'a]h Aig]_ž'?ibgh'ibXʻ; Ughfcbca]Y"
- 8]Y 'Hi hh`]b[Yf'DiddYbVØ\bY' 'Y]b'<][\`][\h'ZØf
 : Ua]`]Ybž'X]Y'a]h']\fYb'?]bXYfb'_fYUh]j Y'i bX
 i bhYf\U`hqUa Y'JcfqhY``i b[Yb'Yf`YVYb'a ÒW\hYb"
- ? cbnYfhY 'i bX 'H\YUhYfUi ZZØ\fi b[Yb 'cZh']a ': fY]Yb cXYf']b'\]ghcf]gW\Yb'; YVÀi XYbž'X]Y'X]Y'k i bXYfVUfY 5ha cqd\ÀfY'j cb'Hi hh`]b[Yb'i bhYfqhfY]W\Yb"

8]Y'l a [YVi b['j cb'Hi hh`]b[Yb']gh'YVYbgc'[YgW\]W\hghf\AW\h]["'9]b _i fnYf'5i gZi ['ZØ\fh'G]Y'ni 'XYb'6i f[fi]bYb'j cb'<c\Ybhk]Y`ž X]Y'a UYgh\Ah]gW\'ØVYf'XYb'6cXYbgYY'h\fcbYb"'8]YgY'Fi]bYb

Yfnà\`Yb'jcb'XYf'VYXYihYbXYb'Fc``Y'XYg'CfhYg']b'XYf'; YgWX]WXhYXYf'FY[]cb'ibX'V]YhYb'gdY_hU_i`àfY'5igV`]W_Y'UiZ'X]Y@UbXqWXUZh"

| GY\Ybgk ØfX][_Y]h | ² ZZbi b[gnY]hYb | 9]bhf]hhgdfY]g |
|--------------------|-----------------------------|----------------|
| GhUXha i gYi a | 8]!Gc*%\$.\$\$!%+.\$\$ |) . |
| Hi hh`]b[Yb | | |
| Gh"; U``i g!?]fWXY | HÀ[`]WX'\$\$!%+.\$\$ | : fY] |
| 5`hYg'FUh\Uig | A c!: f'\$\$!%&.\$\$ | : fY] |
| FÒa YfVUX | A U]!GYd '%\$.\$\$!%, .\$\$ | + ' |

8]Y'[YgWX]WX hghfÀWX h][Yb'i bX'_i `hi fY``Yb'<][\`][\hg'Hi hh`]b[Ybg a UWXYb'X]Y'GhUXh'ni 'Y]bYa 'ZUgn]b]YfYbXYb'N]Y''ZØf'YXYbž'XYf a Y\f'ØVYf'X]Y'JYfV]bXi b[Yb'nk]gWXYb'JYf[Ub[Yb\Y]h'i bX; Y[Ybk Ufh'YfZU\fYb'a ÒWXhY"'9[U`ž'cV'G]Y'Ub'; YgWX]WXhYž 5fWX]hY_hi f'cXYf'?i bgh']bhYfYgg]Yfh'g]bXž'Hi hh`]b[Yb'\Uh'U```X]Yg ni 'V]YhYb'i bX'bcWX'j]Y``a Y\f°

H]ddg'ZØf'YbhgdUbbYbXY'5igZ`Ø[Y'fibX'ia Hihh`]b[Yb

Hi hh`]b[Ybž'VY_Ubbh'ZØf'gY]bY'UhYa VYfUi VYbXY'BUhi f'i bX W\Ufa UbhY'5`hghUXhž'V]YhYh'nU\`fY]W\Y'A Ò[`]W_Y]hYb'ZØf YbhgdUbbYbXY'5i gZØ[Y"'9[U`ž'cV'Xi 'X]Y'Fi\Y'XYf'BUhi f'gi W\gh cXYf'X]Y'`c_U`Y'?i `hi f'Yf`YVYb'a ÒW\hYghž'\]Yf'g]bX'Y]b][Y'H]ddgž k]Y'Xi 'XY]bYb'5i ZYbh\U`h']b'i bX'i a 'Hi hh`]b[Yb'fi\]['i bX Yf\c`gUa '[YghU`hYb'_Ubbgh"

9]b 'UVgc`i hYg'A i gg'ZØf'B Uhi f`]YV\UVYf']gh'XYf'GW\`i W\hYbghY]["8]YgY'hfUi a\UZhY'K UbXYffci hY'ZØ\fh'X]W\'i bhYf'UbXYfYa 'Xi fW\X]Y'ZUgn]b]YfYbXY'I a [YVi b['XYf'K i hUW\gW\`i W\h"\8]Y
K UbXYfi b['Ybh`Ub['XYf'K i hUW\'VY[Y]ghYfh'a]h'VYY]bXfi W_YbXYb5i gV`]W_Ybž'dfÀW\h][Yb': Y`gZcfa Uh]cbYb'i bX'XYf'i bVYfØ\fhYbBUhi fž'X]Y'ni a 'J Yfk Y]`Yb'Y]b`ÀXh"'DUW_Y'X]f'Y]b'D]W_b]W_Y']b'i bX[Yb]Y\gamma'XYf'BUhi f"

9]b'k Y]hYfYf'YbhgdUbbYbXYf'Cfh']gh'XYf'GhUXh[UfhYb Hi hh`]b[Yb"'<]Yf'_Ubbgh'Xi 'XifW\'[YdZY[hY'; fØbUb`U[Yb gdUn]YfYbž'Ui Z'Y]bYf'6Ub_'g]hnYb'i bX'X]Y'Zf]gW\Y'@ Zh'[Yb]Y»Yb"

⇒a 'Gca a Yf'Z]bXYb'\]Yf'cZh'JYfUbghU`hi b[Yb'i bX'_`Y]bY'?cbnYfhY
ghUhh"'8Yf'8i Zh'j cb'V`Ø\YbXYb'6`i a Yb'i bX'XUg'Nk]hgW\Yfb'XYf
JÒ[Y`'gW\UZZYb'Y]bY'Ub[YbY\a Y'5ha cgd\ÀfYž']XYU`ž'i a 'XYb
5``hU['\]bhYf'g]W\'ni '`UqqYb"

6Ygi WXY X]Y bU\Y[Y`Y[YbYb GYYbž'k]Y XYb gWX ObYb

< ØZ]b[Yf GYY cXYf XYb 6UUfgYY "8]YgY ; Yk AggYf `UXYb b]WXh

bi fini a "GWXk]a a Yb Y]bž gcbXYfb Ui WX ni a "9bhgdUbbYb Ua

I ZYf "8i _Ubbgh HfYhVcch ZU\fYbž \]bhYfa "I ZYf gdUn]YfYb cXYf

Y]bZUWX X]Y GcbbY [Yb]Y» Yb "6Y]XY GYYb g]bX `Y]WX hia]h XYa

5i hc cXYf XYa : U\ffUX ni YffY]WX Yb i bX V]YhYb Y]bY dYfZY_hY

5i gnY]h j cb XYf < Y_h]_ XYg `HU[Yg"

B]Wkh'[Ubn'k Y]h'j cb'Hi hh`]b[Yb'YbhZYfbh'VYZ]bXYh'g]Wk'X]Y'H\Yfa Y']b'6UX'8Øff\Y]a "'8]Y'H\Yfa U`Ub`U[Y'V]YhYh'j]Y`Y
K Y``bYgg!5bk YbXi b[Ybž'GWk]a a VYW_Ybž'GUi bYb'i bX
Fi\YVYfY]WkY"'; ObbY'X]f'Y]bY'HU[Yg_UfhY'i bX'`Ugg'X]Wk'j cb
Yf\c`gUa Yb'A UggU[Yb'i bX'k Ufa Yb'H\Yfa U`k UggYf'j Yfk O\bYb"
8]Y'YbhgdUbbYbXY'5ha cgd\AfY'a UWkh'Yg'Y]bZUWkž'g]Wk'ni
YbhgdUbbYb'i bX'XYb'5``hU[gghfYgg'\]bhYf'g]Wk'ni '`UggYb"

<]Yf "g]bX"Y]b][Y"k Y]hYfY"YbhgdUbbYbXY"5i gZi [gh]ddg"fi bX"i a Hi hh`]b[Yb.

- : U\ffUXhcifYb. '9f_i bXY'X]Y'a U`Yf]gW\Yb'FUXk Y[Y'i a Hi hh`]b[Yb'i bX'[Yb]Y» Y'X]Y'\Yff`]W\Y'@UbXgW\UZh"
- GhUXhZØ\fi b[Yb.'B]a a 'Ub'Y]bYf'[YZØ\fhYb'Hci f'Xi fW\X]Y'5`hghUXh'hY]`'i bX'YfZU\fY'a Y\f'ØVYf'X]Y'; YgW\]W\hY i bX'?i `hi f'XYf'FY[]cb"

- K Y]bdfcVYb. '6Ygi WXY '`c_U`Y'K Y]b[ØhYf']b'XYf
 I a [YVi b['i bX'[Yb]Y»Y'X]Y'?i `]bUf]_']b'Y]bYf
 [Ya Øh`]WXYb'I a [YVi b["
- 6Ygi WX 'Y]bYg'? `cghYfg. '8 Ug'? `cghYf'6Yi fcb']gh'bi f'Y]bY
 _i fnY'5i hcZU\fh'YbhZYfbh'i bX'V]YhYh'Y]bYb'Cfh'XYf'Gh]``Y
 i bX'6Yg]bbi b["

9]bY'[ihY'A Ò[`]WX_Y]hža]h'XYf'BUhif'ni ']bhYfU[]YfYb'ibX'XY]b K c\`VYZ]bXYb'ni 'ghY][Yfbž']gh'XYf'6Ygi WX 'Y]bYg'Mc[U! FYhfYUhgž'XUg']b'XYf'Ia [YVib['jcb'Hihh']b[Yb'Ub[YVchYb'k]fX"8]YgY'FYhfYUhg'V]YhYb'jYfgWX]YXYbY'Dfc[fUaaY'ibX'Kcf_g\cdgUbžia'?ÒfdYf'ibX';Y]gh']b'9]b_`Ub['ni 'Vf]b[Yb"

| 5_h]j]hÀh | Cfh | 6YgcbXYf\Y]hYb | |
|--------------|---------------------------|----------------------|--|
| K UbXYfb | KihUWXgWX`iWXh | : Ugn]b]YfYbXY | |
| | | 5i gV`]W <u>_</u> Yž | |
| | | ibVYfØ\fhYBUhif | |
| GhUXh[UfhYb | Hi hh`]b[Yb | ; fØbUb`U[Ybž | |
| | | JYfUbghU`hi b[Yb']a | |
| | | Gca a Yf | |
| 6UXYgYY | < ØZ]b[Yf`GYY | GWk]a a Ybž | |
| | | HfYhVcchZU\fYb | |
| K Y``bYgg | 6UX [*] 8Øff\Y]a | H∖Yfa U`k UggYfž | |
| | | GUi bYb | |

8]YgY'H]ddg'\Y`ZYb'X]fž'XY]bYb'5i ZYbh\U`h']b'i bX'i a 'Hi hh`]b[Yb a Ò[`]W\gh'YbhgdUbbYbX'ni '[YghU`hYb"'A]h'Y]bYf'A]gW\i b['Ui g BUhi fž'?i `hi f'i bX'K Y``bYgg'\Ugh'Xi 'nU\`fY]W\Y'A Ò[`]W_Y]hYbž'X]YGYY`Y'VUi a Y`b'ni '`UggYb'i bX'bYi Y'9bYf[]Y'ni 'hUb_Yb"'JYf[]gg b]W\hž'X]f'Ui W\'Yhk Ug'NY]h'ZØf'X]W\'gY`Vgh'ni 'bY\a Yb'i bX'XY]bY I a [YVi b['VYk i ggh'ni '[Yb]Y»Yb"

8]Y'VYghYb'I bhYf_ØbZhY'ZØf'Y]bYb i bj Yf[Ygg`]W\Yb'5i ZYbh\U`h

 $K Ybb G]Y Hi hh`]b[Yb VYgi WXYbž']gh'X]Y 5i gk U\`XYf'f]WXh][Yb LbhYf_i bZh'YbhgWXY]XYbX'ZØf' = Ybb'5i ZYbh\U`h''8]Y GhUXhž'X]Y jcb XYf'fY]nj c``Yb'@UbXgWXUZh'XYf'GWXk ÀV]gWXYb'5`V'i a [YVYb']ghž$

 $\label{eq:cazefhu} $$V]YhYhY]bY'J]Y`nU\``Ub', VYfbUW\hib[ga Õ[`]W_Y]hYbž'X]Y'gck c\`?ca Zcfh'U`g'Ui W\``c_U`[YdfÀ[hY'9f`YVb]ggY'j YfgdfYW\Yb'''9[U`ž'cVG]Y'bUW\'Y]bYa ``i I i f]ÒgYb'<chY`ž'Y]bYf'[Ya Øh`]W\Yb'DYbg]cb cXYf'Y]bYf'dfU_h]gW\Yb': Yf]Ybk c\bib['gi W\Ybž']b'Hi hh`]b[Yb'[]Vh Yg'ZØf'YXYb'FY]gYbXYb'X]Y'f]W\h][Y'Cdh]cb''$

@ lig\chY`g`i bX`[Y\cVYbY`l bhYf_ØbZhY : Øf`FY]gYbXYž'X]Y`g]W\`bUW\`Y]bYa `<Ui W\`j cb`@ lig`gY\bYbž'[]Vh Yg`]b`Hi hh`]b[Yb`Y]b][Y`Yfgh_`Ugg][Y`<chY`g"`8]YgY`V]YhYb`b]W\h`bi f gh]`j c``Y`N]a a Yfž'gcbXYfb`Ui W\`\Yfj cffU[YbXY 5bbY\a`]W_Y]hYb"<]Yf`g]bX`Y]b][Y`XYf`VYghYb K U\`a O[`]W_Y]hYb.

 $$$ \chY^!; Ugh\cZ^@Ok\Yb.^9]b^ZUa\]^]Yb[YZ\emptyset\fhYg^<chY^z^XUg hfUX]h]cbY^Yb^7\Ufa a]h^a cXYfbYa ??ca Zcfh^j YfV]bXYh^"<]Yf_ObbYb^; AghY^]b^Y]a Y^][Yf^5ha cgd\AfY^YbhgdUbbYb^i bX^X]Y; UghZfYi bXgWXUZh^XYf^FY[]cb^Yf^YVYb"$

; Ya Øh`]W\Y'DYbg]cbYb'i bX'6/6g

K Ybb'G]Y'X]Y'\Yfn`]W\Y'5ha cgd\ÀfY'XYf'FY[]cb'Yf`YVYb

a ÒW\hYbž'g]bX'DYbg]cbYb'i bX'6YX'/6fYU_ZUghg'Y]bY

Ui g[YnY]W\bYhY'K U\`"8]YgY'I bhYf_ØbZhY'V]YhYb'cZh'`c_U`Y

GdYn]U`]hÀhYb'ni a ': fØ\ghØW_'i bX'Y]bYb'dYfgÒb`]W\Yb'GYfj]W\.

 $\label{eq:continuous} $$ DYbg]cb'V]YhYh'[Ya \varnothing h']WXYN]a a Yf'i bX'Y]b': f\varnothing \ghØW_ a]h'Zf]gWXYbž'fY[]cbU`Yb'Ni hUhYb''8]Y`]YVYj c``Y]b[Yf]WXhYhYb'FÀi a `]WX_Y]hYb'gcf[Yb'ZØf'Y]b'K c\`ZØ\`! 5a V]YbhY''$

6/6'Ua : `i gg. '8]fY_h'Ua '8cbUi i ZYf'[Y`Y[Ybž'V]YhYh'X]YgYg 6/6'Y]bY'UhYa VYfUi VYbXY'5i gg]W\h'i bX'Y]bY'fi \][Y 5ha cgd\ÀfY"'; Yb]Y»Yb'G]Y'X]Y'BUhi f'i bX'VY[]bbYb'G]Y'XYb'HU[a $]hY]bYa _Ogh]WXYb : fØ\ghØW_Ui ZXYf HYffUggY"$

: Yf]Ybk c\bi b[Yb i bX !\Ài gYf

 $: \varnothing f': Ua]`]Yb'cXYf'; \ fi \ ddYbž'X]Y'a \ Y\backslash f'D`Uhn'i \ bX': `YI]V]`]hÀh k \varnothing bgW\Ybž'g]bX': Yf]Ybk c\bi b[Yb'Y]bY'hc``Y'Cdh]cb"'G]Y'V]YhYb b]W\h'bi f'GY`Vghj Yfgcf[i b[ga <math>\grave{O}[`]W_Y]hYbž'gcbXYfb'cZh'Ui W\ Y]bY'Y]bn][Ufh][Y'`c_U`Y'5ha cgd\ÀfY"$

:: Yf]Ybk c\bi b['Hi hh`]b[Yb. '8]YgY'a cXYfb'Y]b[Yf]W\hYhY :: Yf]Ybk c\bi b[']gh']XYU`'ZØf``Àb[YfY'5i ZYbh\U`hY"'G]Y']gh'[i h Ui g[YghUhhYh'i bX'V]YhYh'Ni [Ub['ni 'Y]bYa '; UfhYbž']b'XYa '; ÀghY YbhqdUbbYb'_ÒbbYb"'

'< Ui g'Ua 'K U`X. '9]b'[Ya Øh`]W\Yg'< c`n\Ui g'Ub'XYb'5i g`Ài ZYfb
XYg'GW\k Ufnk U`Xg"'<]Yf'Z]bXYb'G]Y'X]Y'dYfZY_hY'?ca V]bUh]cb'Ui g
BUhi f'i bX'?ca Zcfh"'⇒XYU`'ZØf'K UbXYfYf'i bX'BUhi f`]YV\UVYf"</pre>

7 Ua d]b['i bX'Ci hXccf!Cdh]cbYb : Øf'5VYbhYi Yf'i gh][Y'[]Vh'Yg'fi bX'i a 'Hi hh']b[Yb'Ui W\'nU\`fY]W\Y 7 Ua d]b[d`ÀhnYž'X]Y'Y]bYb'X]fY_hYb'Ni [Ub['ni f'BUhi f'V]YhYb"'

7 Ua d]b[d`Uhn`Hi hh`]b[Yb.`8]YgYf`ZUa]`]YbZfYi bX`]W\Y
7 Ua d]b[d`Uhn`V]YhYh`\Yfj cffU[YbXY`9]bf]W\hi b[Yb`i bX`Y]bYb
a U`Yf]gW\Yb`6`]W_`Ui Z`X]Y`i a `]Y[YbXY`@UbXgW\UZh"`DYfZY_h`ZØf
Y]bYb`U_h]j Yb`I f`Ui V"

"K]`Xb]gWUa d]b[']a '8 c b Ui hU`.': Øf'X]Y Yb][Ybž'X]Y 'XUg
5 V Y b hY i Yf'gi W\ Y b ž'[]V h'Yg'X]Y 'A Ò[`]W\ _Y]hž']b 'XYf'B Uhi f'ni
WUa dYb"' <]Yf'_ÒbbYb'G]Y 'i b hYf'XYa 'GhYfbYb\]a a Y`'gW\`UZYb
i b X'g]W\ ']b 'XYf'i b V Y f Ø\ f hY b 'B Uhi f'Yf\ c`Yb"</pre>

 $\label{eq:continuous} $$ VYfV^*]W_*XYf^*I_bhYf_ØbZhY^*]b^*Hi_hh^*]b[Yb <]Yf^*]gh^*Y]bY^*_i fnY^*, VYfg]Wk_h^*XYf^*j_YfgWk_]YXYbYb $$I_bhYf_i_bZhga_O^[^*]Wk_Y]hYb^*]b^*Hi_hh^*]b[Ybž^*X]Y^*_+fY^6YXØfZb]ggY_]XYU^*UVXYW_Yb^*_ObbhYb.$

IbhYf_ibZh
Hmd
@U[Y
6YgcbXYf\Y]hY

b

| lbhYf_ibZh | Hmd | @U[Y | 6YgcbXYf\Y]hY |
|------------------|------------------|---------------|-------------------|
| | | | b |
| < c hY``GhUXh | < c hY ` | NYbhfi a | AcXYfbYg |
| Hi hh`]b[Yb | | | 8 Y g][bž |
| | | | FYghUi fUbh |
| DYbg]cb | DYbg]cb | BU\Y`NYbhfi a | < Y]a Y`][ž |
| 8 U\Y]a | | | fY[]cbU`Yg |
| | | | : fØ\ghØW_ |
| : Yf]Ybk c\bi b[| : Yf]Ybk c\bi b[| GhUXh[YV]Yh | ; UfhYbž'GY`Vgh |
| Hi hh`]b[Yb | | | jYfgcf[ib[|
| 7Ua d]b[d`Uhn | 7Ua d]b[| la`UbX | : Ua]`]YbZfYi bX |
| Hi hh`]b[Yb | | | `]W\ž'BUhif |

 $8]Y'5i gk U\``Ub'I bhYf_ØbZhYb']b'Hi hh`]b[Yb']gh'j]Y`Zh`h]['i bX V]YhYh'ZØf'YXYb'; YgWXa UW_Yhk Ug'''9[U`ž'cV'G]Y'Y]bYb fca Ubh]gWXYb'?i fni f`Ui Vž'Y]bY': Ua]`]YbfY]gY'cXYf'Y]b'5VYbhYi Yf]b'XYf'BUhi f'd`UbYbž'Hi hh`]b[Yb'\Uhij]Y`ni 'V]YhYb'''JYf[YggYb'G]Yb]WXhž']a 'JcfUi g'ni 'Vi WXYbž']bgVYgcbXYfY'k A\fYbX'XYf < Ui dhfY]gYnY]hYbž'i a 'X]Y'VYghYb'5b[YVchY'ni 'g]WXYfb'i bX'\$fYb 5i ZYbh\U`h'gc'Ub[YbY\a'k]Y'a <math>O[`]WX'$ ni '[YghU`hYb'''K Y]hYfY\\$Zcfa Uh]cbYb'ØVYf'<chY`g'i bX'I bhYf_ØbZhY']b'Hi hh`]b[Yb'Z]bXYb G]Y'Ui Z'XYf'c ZZ]n]Y``Yb'K YVg]hY''

8 Y hU]`c

6Ygi WXYb G]Y i bg Ui Z Y]bY!fY]gY "XY