

6Y]'Y]bYa : fcbhU`ni gUa a Ybghc» ']b'ChhYfgVYf['ghUfVYb'Y]b A Ubb'i bX'gY]bY'9\YZfUi "'8Yf'I bZU``'YfY][bYhY'g]WX'Ui Z'XYf @%) ("

 $= \text{@UbX_fY]g'JYfXYb'YfY][bYhY'g]W\ `Ua `8]YbghU[a cf[Yb'Y]b hfU[]gW\Yf'JYf_Y\fgi bZU``ž'XYf'nk Y]'A YbgW\Yb`YVYb'ZcfXYfhY'''9]b))!\A\f][Yf'A Ubb'Z\fa]h'gY]bYa '?`Y]bk U[Yb'Ui Z'XYf @UbXYgghfU\"Y'\%) ('i bX'[Yf]Yh'Ui g'V]g\Yf'i b[Y_`\AfhYb'; f\ObXYb']b XYb'; Y[Ybj Yf_Y\f''$

9g'k Uf'[Y[Yb'-.'\$'I\fž'U`g'XYf'A Ubb']a '?i fj YbVYfY]W\'nk]gW\Yb ChhYfgVYf['i bX'EiY`_\cfb'a]h'Y]bYa 'Ybh[Y[Yb_ca a YbXYb @Ughk U[Yb'_c``]X]YfhY"'6Y]'X]YgYa ': fcbhU`ni gUa a Ybghc» 'k i fXY XYf'? `Y]bk U[Yb'gc'ghUf_'VYgW\ÀX][hž'XUgg'Yf'ni fØW_[YgW\`Yi XYfh [Y[Yb'Y]b'bUW\Zc`[YbXYg'5i hc'dfU``hY"'8Yf': U\fYf'XYg ?`Y]bk U[Ybg'j YfghUfV'bcW\'Ub'XYf'I bZU``ghY``Yž'k À\fYbX'gY]bY (*!'À\f][Y'9\YZfUi ž'X]Y'Ui Z'XYa '6Y]ZU\fYfg]hn'gU» ž'gW\k Yf j Yf`Yhnh'k i fXY"

GWX cW ZØf X Y 6 Y hY Y hY hY b

8]Y'6Y]ZU\fYf]b'a i gghY'Xi fW\'X]Y': Yi Yfk Y\f'Ui g'XYa 'K fUW_VZfY]h'k YfXYb'i bX'k i fXY']b'Y]bYa '_f]h]gW\Yb'Ni ghUbX']bg ?fUb_Yb\Ui g'[YZc[Yb"'@Y]XYf'Yf`U['g]Y'gdÀhYf']\fYb JYf`Yhni b[Yb"'8Yf': U\fYf'XYg'@Ughk U[Ybg'gck]Y'XYf'UbXYfY VYhY]`][hY'5i hcZU\fYf'ghUbXYb'bUW\'XYa 'I bZU``i bhYf'GW\cW_"'8]Y Dc`]nY]'VYf]W\hYhz'XUgg'Y]b'GUW\gW\UXYb'j cb'Yhk U'') "\$\$\$'9i fc YbhghUbXYb']gh"

 $8]Y `[YbUiYb `IaghÀbXYž `X]Y `ni `XYa `Ib[`ØW_`ZØ\fhYbž `g]bX a caYbhUb `bcW\ `ib_`Uf" `9]b `IbZU``[ihUW\hYb `_ObbhY `]b `XYb _caaYbXYb `HU[Yb `aY\f'@]W\h`]bg `8ib_Y``Vf]b[Yb" `Gc`W\YhfU[]gW\Yb `JcfZ\``Y `kYfZYb `cZh': fU[Yb `UiZž]bgVYgcbXYfY\]bg]W\h`]W\ `XYf `JYf_Y\fgg]W\Yf\Y]h`]b `XYf `FY[]cb"$

$K Ug ghYW_h \]bhYf XYb NU \ Yb3$

I bZÀ``Y`X]YgYf`5fh`g]bX`nk Uf`b]W\h`Ub`XYf`HU[YgcfXbi b[ž·ghY``YbYxcW\'Y]b`VYXYi hYbXYg`G]W\Yf\Y]hgf]g]_c`XUf"`8Yf`@UbX_fY]g
J YfXYbž`VY_Ubbh`ZØf`gY]bY`fi \][Yb`GhfU»Ybž`_ObbhY`b]W\h`Ui Z
gc`W\Y`JcfZÀ``Y`jcfVYfY]hYh`gY]b"`8]YgYf`I bZU```ibhYfghfY]W\h`X]Y
Bchk YbX][_Y]hž`JYf_Y\fg]bZcfa Uh]cbYb`ibX
G]W\Yf\Y]hga U»bU\aYb`ni `ØVYfdfØZYb`ibX`aO[`]W\YfkY]gY`ni
j YfVYggYfb"`8cW\'UiW\`\]Yf`[]`hž`XUgg`dfÀjYbh]jY`AU»bU\aYbb]W\h`]a aYf`gÀah`]W\Y`Ib[`@W_Y`jYf\]bXYfb`_ObbYb"`8]Y
9fa]hh`ib[Yb``UiZYb"

8]Y'HfU[]_'i bX'XUg'@Y]Xž'X]Y'Xi fWX'gc`WXY'I bZÀ``Y'YbhghY\Ybž'g]bXcZh'b]WXh']b'NU\`Yb'ni 'ZUggYb"'<]bhYf''YXYf'NU\``ghY\Yb'A YbgWXYbibX'XYfYb'; YgWX]WXhYb"'8Yf'GWXa Yfn'ZØf'X]Y'5b[Y\Òf][Ybž'X]YXi fWX'X]YgYb'JcfZU``'bi b'i a ']\fY'@]YVghYb'hfUi Yfb'a ØggYbž']ghibVYnU\`VUf"'\D'XYf'<]hnY'XYg'A ca Ybhgž'VY]': U\fhYb'Xi fWX_i fYbfY]WXY'; YV]YhYž'_Ubb'Y]bY'I bUWXhgUa _Y]h'ZUhU`Y': c`[Yb\UVYb"

9]bY'l bhYfgi Wki b[\check{z} 'X]Y'X]Y'Dc`]nY]'bi b'Y]b`Y]hYh \check{z} '_ \check{O} bbhY'j]Y``Y]Wkh b]Wkh'bi f'@]Wkh'Ui Z'X]Y'6YX]b[i b[Yb'XYg'HU[Yg'XYg'I b[` \check{O} W_g k YfZYb \check{z} 'gcbXYfb'Ui Wk'Ui Z'a \check{O} [`]WkY'U``[Ya Y]bY J Yf_Y\fgg]WkYf\Y]hgZfU[Yb'i bX'A \check{A} b[Y`']b'XYf' \Rightarrow DfUghfi _hi f"'9g V`Y]Vh'<cZZbi b[\check{z} 'XUgg'gc`WkY'hfU[]gWkYb'I bZ \check{A} ``Y']b'Ni _i bZh j Yf\]bXYfh'k YfXYb'_ \check{O} bbYb"

 $8 \ Ugg \ gc \ W Y \ GW \ fY \ W_Y b \ b] W \ h \ \emptyset V Y f \ Ub X b Y \ a \ Y b \ X Uf Z \]gh \ Y] b Y \ k \]W \ h][\ Y \ 9 f_Y b \ bh b] g \ X] Y g Y f \ H f U[\ OX] Y \ " G Y b g] V] \]g] Y f i \ b[\ i \ b X \ 5 i \ Z_ \ A f i \ b[\]a \ Gh f U \ Y b J Y f_Y \ f \ g] b X \ i \ b Y f \ A g g \]W \ Z \ i \ a \ g c \ W Y \ h \ Ui \ f][\ Y b \ 9 f Y][\ b] g g Y \ n i \ j \ Y f \]b X Y f b "$

I fgUW $Y'XYg'I bZU``g'i bX'JYf_Y\fgg]WXYf\Y]h$

8]Y'[YbUiYb'laghàbXYž'X]Y'ni'X]YgYa'hfU[]gWXYb'lbZU```ZØ\fhYbžg]bX'XYfnY]h'bcWX'ib_`Uf"'9g']gh'YXcWX'VY_Ubbhž'XUgg
5V`Yb_ib[Yb'VY]a': U\fYbž'gWXbY``Y'; YgWXk]bX][_Y]h'cXYf
[YgibX\Y]h']WXY'DfcV`YaY'\ÀiZ][Y'lfgUWXYb'ZØf'XYfUfh][Y
JYf_Y\fgibZÀ``Y'g]bX"'GhUh]gh]_Yb'nY][Ybž'XUgg'5V`Yb_ib[Ybž'k]Y
XUg'6YbihnYb'XYg'<UbXmg'cXYf'XUg'9ggYb'kÀ\fYbX'XYf': U\fhžg][b]Z]_Ubh'nif'IbZU``\ÀiZ][_Y]h'VY]hfU[Yb"'@Uih'XYa'8YihgWXYb
JYf_Y\fgg]WXYf\Y]hgfUh'fBJFŁ'g]bX'_cb_fYhY'AU» bU\aYb'nif
JYfVYggYfib[XYf'JYf_Y\fgg]WXYf\Y]h']aaYf'k]WXh][Yfž'iagc`WXYf'Y]'JcfZÀ``Y'ni'jYfaY]XYb"

±0.6Yni ['Ui Z'X]Y'J Yf_Y\fgg]W\Yf\Y]hik i fXYb']b'XYb'`YhnhYb'*J\fYbj]Y`Y'Dfc[fUa a Y']bg'@YVYb'[Yfi ZYb"'8 Uni 'nÀ\`Yb 5i Z_`Àfi b[g_Ua dU[bYb'i bX'j YfghÀf_hY'?cbhfc``Yb'Xi fW\'X]Y Dc`]nY]"'8YbbcW\'V`Y]Vh'X]Y'NU\``XYf'J Yf_Y\fgi bZÀ``Yž]bgVYgcbXYfY'a]h'DYfgcbYbgW\UXYbž'VYgcf[b]gYffY[YbX"

FYU_h]cb'XYf; Ya Y]bXY'i bX'XYf ² ZZYbh`]WX_Y]h

I bZÀ``Y`k]Y`X]YgYf`\UVYb`kY]hfY]W\YbXY`5i gk]f_i b[Yb`Ui Z`X]Y
VYhfcZZYbYb'; Ya Y]bXYb"'BUW\`XYa 'JcfZU```]b`ChhYfgVYf['kifXY
X]Y`HfUi Yf'i bX`XUg`9bhgYhnYb']b`XYf`Òfh`]W\Yb`6Yj Ò`_Yfi b[
gdØfVUf"'9g`]gh`b]W\h'bi f`XYf`JYf`i gh'j cb`nkY]`A YbgW\Yb`YVYbž
gcbXYfb`Ui W\`XYf`GW\cW_ž`XYf`X]Y'; Ya Y]bgW\UZh`Xi fW\Xf]b[h"
J]Y`Y`A YbgW\Yb`]b`XYf`I a [YVi b['nY][hYb']\f`A]h[YZØ\`
[Y[YbØVYf`XYb`5b[Y\Òf][Yb`XYf`CdZYf"

 $8 \ Uf@VYf^{\}]b \ Ui \ g^{\}b]h]YfYb \ cZh^{\}c_U^{\}Y \ Cf[\ Ub]gUh]cbYb^{\}i \ bX^{\}J \ YfY]bY \\ ; \ YXYb_j \ YfUbghU^{\}hi \ b[\ Ybz^{\}i \ a \ XYb^{\}J \ YfghcfVYbYb^{\}Y \]bYb^{\}YhnhYb \\ Hf]Vi \ h^{\}ini \ ^{\}nc^{\}Yb^{\}i \ bX^{\}XUg^{\}6Yk \ i \ gghgY]b^{\}Z@f^{\}X]Y^{\}; \ YZU^{\}fYb^{\}XYg \\ GhfU_{\}Yb_j \ Yf_Y^{\}fg^{\}ni \ ^{\}gWX AfZYb^{\}Gc^{\}WXY^{\}b]h]Uh]j \ Yb^{\}ZOfXYfb^{\}b]WX h^{\}bi \ f \\ X]Y^{\}HfUi \ YfVYk \ A^{\}h][\ i \ b[\ z^{\}gcbXYfb^{\}Ui \ WX^{\}X]Y^{\}8 \]g_i \ gg]cb^{\}@VYf \\ J \ Yf_Y^{\}fg]WXYf^{\}]h''$

$Ni _\emptyset b Zh][Y A U b U a Yb ni f J Yf_Y fgg]W Yf Y]h$

±0.5 b V Y h f U W h i X Y f i g h Y] [Y b X Y b i N U \ ` i j c b i J Y f _ Y \ f g i b Z h `` Y b i _ O b b h Y Y g i Z Ø f i X] Y ini g h h b X] [Y b i 6 Y \ O f X Y b i g] b b j c `` i g Y] b z j Y f g h h f _ h i U i Z d f h j Y b h j j Y i A U » b U \ a Y b i ni i g Y h n Y b " 8 U ni i n h \ `Y b i b h Y f i U b X Y f Y a X] Y i ⊕ g h U `` U h] c b i j c b i a Y \ f i; Y g W k] b X] [_ Y] h g _ c b h f c `` Y b z i X Y f 5 i g V U i i j c b i , V Y f k U W i b [g a U » b U \ a Y b i b X i X] Y i J Y f V Y g g Y f i b [X Y f G h f U » Y b] b Z f U g h f i _ h i f " i ⊕ i j] Y `Y b i F Y [] c b Y b i 8 Y i h g W \ `U b X g b] a a h x] Y i N U \ `` X Y f i J Y f _ Y \ f g i b Z h `` Y i h f c h n i Z c f h k A \ f Y b X Y f 6 Y a Ø \ i b [Y b i b] W h i U V z k U g i 5 b `U g g i n i f `G c f [Y i] V h "

I a 'XYf'\c\Yb'5bnU\`'Ub'j Yf_Y\fgVYX]b[hYb'JYf`Yhni b[Yb'i bX HcXYgZÀ``Yb'Ybh[Y[Ybni k]f_Ybž'k]fX'Ui W\'j cb': UW\`Yi hYb [YZcfXYfhž'XUgg': U\fgW\i `Yb'i bX'JYf_Y\fgYfn]Y\i b[gdfc[fUa a YghÀf_Yf'Ui Z'X]Y'6YXYi hi b['XYf'5V`Yb_i b[gZfY]\Y]hii bX'XYZYbg]j Y: U\fhYW\b]_Yb'Y]b[Y\Yb''@Ui h'XYa '5857'`]Y[h'Y]b'[fc»Yg DchYbn]U``]b'XYf'GW\i `i b['j cb': U\fUbZ\b[Yfbž'i a 'g]Y'ZØf a \O[`]W\Y'; YZU\fYb'ni 'gYbg]V]`]g]YfYb''

8 Y hU]`g

6 Y qi W Y b 'G | Y 'i b q 'U i Z 'b ! U ["X Y