?`Y]bYf'@Yi WX hhi fa .`BYi UbZUb['ZØf''i b[Y HU`YbhY']b'< UggY`°

±b '< UggY`'ghUfhYh'XUg'K c\bdfc Y_h' ?`Y]bYf'@Yi W\hhi fa 'ZØf

→ [YbX`]W\Yž'i a '±bhY[fUh]cb'i bX'ZUa]`]ÀfY'Ghfi _hi fYb'ni

ZÒfXYfb"



< UggY`ž'8 Yi hgWX`Ub X`! "#D` < UggY`ž'Y]bYf'_`Y]bYb'; Ya Y]bXY']b
XYf'; fUZgWX UZh' < cmUž'\Uh'Y]b']bbcj Uh]j Yg'K c\bdfc Y_h'ZØf

i [YbX`]WXY'j]Y``5i Za Yf_gUa _Y]h'YffY[h"'8Yf' ?`Y]bY
@Yi WX hhi fa ž']b]h]]Yfh'j cb'HUb'U' < cdda Ubb'i bX']\fYa 'Gc\b
&bUh\Ubž'VY]XYb'Ui g[YV]`XYhYb'9fn]Y\Yfbž'V]YhYh'i [YbX`]WXYb
]a '5`hYf'j cb'%('V]g'%, '\\\fYb'Y]b'bYi Yg'Ni \Ui gY"'8 Ug'Dfc'Y_h
ghUfhYhY'j cf'Yhk U'UWXh'A cbUhYb'i bX'\Uh'gY]hXYa 'j]Y`Y'dcg]h]j Y
9bhk]W_`i b[Yb'Xi fWX`Ui ZYb"</pre>

 $8 \ Yf' YfghY'6 Yk \ c\ bYf'nc[']a'8 \ YnYa \ VYf' \& \$\& ('Y]b \ z'i \ b X'gY]h'5 df]' \& \$\&) ']gh' X Ug''YhnhY'N]a a Yf' VYYY[h''8]Y' \(i \) [Yb X']W\ Yb''YVYb'\]Yf' Yb UW\ ']\ fYa 'ZUa]']\(i \) fYb' <]bhYf[fi b X'ZØf' VYgh]a a hY'NY]hf\(i \) a Y z'V]g g]Y' X]Y' J c'''\(A\) f][_Y]h'YffY]W\ Yb''c XYf''\(Ab[Yf'''8]Y''9]bf]W\ hi b['']b$

Y]bYa 'fYbcj]YfhYb' < Ui g'i a ZUggh'Y]b'K c\bn]a a Yfž'Y]bY'?ØW\Y i bX']bX]j]Xi Y``'[YghU`hVUfY'N]a a Yfž'X]Y'XYb'6Yk c\bYfb'Y]b; YZØ\`'j cb'9][Ybj YfUbhk cfhi b['i bX'Ni [Y\Òf][_Y]h'j Yfa]hhY`b"

; Ya Y]bgW\UZh'i bX'5``hU[']a'?`Y]bYb @Yi W\hhi fa

 $8 \ Yf'5 \ \ hU[\]b'XYf'K \ c\ b[\ fi\ ddY'Z \ b_h]cb]Yfh'Xi \ fWX'_`UfY\\ Ghfi _hi \ fYb'i \ bX'HYUa \ !5 \ VgdfUWXYb'[\ i \ hž'k \ cVY]'[\ Y`Y[\ Ybh`]WXY\\ ?cbZ]_hYž'A\b`]WX'k \]Y']b'Y]bYf'bcfa U`Yb': Ua]`]Yž'Ui ZhfYhYb'' \\ 6 \ YgcbXYfg'YfZfYi `]WX']ghž'XUgg'XYf''Øb[ghY'6Yk c\bYf'U_h]j ']a \\ \dot{O}fh`]WXYb': i ~VU``j YfY]b'gd]Y`hž'k Ug'X]Y' <math>\Rightarrow$ hY[fUh]cb'Z \dot{O} fXYfh'i bX Xi fWX'X]Y'dcg]h]j Yb'F ØW_a Y`Xi b[Yb'XYf'J YfY]bY'i bhYfghØhnh k]fX'''8]Y'UbZAb[`]WXY'G_Ydg]g'XYf'B UWXVUfb'\Uh'g]WX'a]hh`Yfk Y]`Y [Y`Y[hž'gcXUgg'Y]b'YbhgdUbbhYg'J Yf\A`hb]g'ni f'B UWXVUfgWXUZh \YffgWXh''

8]Y?]bXYfVYgi WXYbGWXi Yb]b'9mghfi d'i bX'<cmU"K À\fYbX UbZUb[g'GdfUWXVUff]YfYb'VYghUbXYbž'_cbbhYb'X]YgY'k Y]h[Y\YbX ØVYfki bXYb'k YfXYb"I a 'Gh][a Uh]g]Yfi b[Yb'Ui Z[fi bX']\fYf K c\bg]hi Uh]cb'Ybh[Y[Ybni k]f_Ybž'Z]bXYh'Y]b'fY[Y`a À»][Yf 5i ghUi gWX a]h'XYb'GWXi Yb'ghUhh"8Yf'cZZYbY'8]U`c['gc``\Y`ZYbž J cfi fhY]Y'UVni VUi Yb'i bX'Y]b'VYggYfYg'J YfghÀbXb]g'ZØf'X]Y G]hi Uh]cb'XYf'\$ [YbX`]WXYb'ni 'gWXUZZYb"

=bhY[fUh]cb Xi fWX gcn]U`Y 5_h]j]hÀhYb

 $8]Y \to hY [fUh]cb : XYf \to [YbX`]WXYb : k]fX : Ui WX : Xi fWX : nU\`fY]WXY : fY]nY]hU_h]j]hÀhYb : [YZÒfXYfhž : k]Y : X]Y : A]h[`]YXgWX UZh :]b : J YfY]bYb ž 5 i gZØ[Y : i bX : DUXXY`hc i fYb " <math>\to$ XYf : K c\b[fi ddY : g]bX :]bg[YgUa h gYWXg : A]hUfVY]hYf :]b : J c ``! : i bX : HY]`nY]h : gck]Y : nk Y] : A]b]! \times VVYf hÀh][ž : X]Y : ni gUa a Yb : Y]bY : ZUa]`]ÀfY : 5 ha cgd\ÀfY : gWX UZZYb " : 8]Y ?]bXYf : g]bX : U_h]j : Ub : XYf : YghU`hi b[:]\fYg : Ni gUa a Yb `YVYbg VYhY]`][h/']\fY := XYYb : i bX : K ØbgWXY : k YfXYb : [Y\Òfhž : i bX : FY[Y`b k YfXYb : [Ya Y]bgUa : X]g_i h]Yfh"

Ni gÀhn`]W\ k]fX Yb[a]h: UW\ ghY``Yb ni gUa a Yb[YUfVY]hYhzi a

X]Y'5bV]bXi b['ni 'XYb': Ua]']Yb'XYf'¾ [YbX']WXYb'ni 'j YfVYggYfb" HUb'U'<cdda Ubb'VYhcbh'X]Y'6YXYi hi b['X]YgYf'A U» bU\a Yb'ZØf X]Y'♣hY[fUh]cb'XYf'¾ [YbX`]WXYb']b'X]Y'; YgY``gWXUZhž'XU'K c\bYb Y]bY'GWX`ØggY`fYggci fW'ZØf'YfZc`[fY]WXY'♣hY[fUh]cb'XUfghY``h" <]Yfni 'j Yfk Y]gh': `ØWX h`]b[gX]U`c[Y'Ui Z'X]Y'Bchk YbX][_Y]h'j cb ghUV]`Yb'K c\bj Yf\À`hb]ggYb'U`g'6Ug]g'ZØf'X]Y'HY]`bU\a Y'Ub 6]`Xi b['i bX'6Yfi Z'

8 UgʻDfc Y_hʻ? `Y]bYfʻ@Yi W\hhi fa inY][hžk]Y`k]W\h]['Y]bʻg]W\YfYg i bX`i bhYfghØhnYbXYgʻK c\bi a ZY`X`ZØf`X]Yʻ9bhk]W_`i b['j cb i [YbX`]W\Yb']ghž`X]Y`i bhYfʻgW\k]Yf][Ybʻ6YX]b[i b[YbʻUi Zk UW\gYb a i gghYb"ʻ9gʻghY``hʻY]bYbʻVYXYi hYbXYbʻGW\f]hhʻ]bʻXYfʻ; Ya Y]bXYb 8 Ufži a 'X]YgYbʻ4 b[YbʻA YbgW\YbʻY]bY`DYfgdY_h]j Y`ni 'V]YhYb"

K Y]hYfY' \pm zcfa Uh]cbYb' \emptyset VYf'XUg'Dfc Υ _h'i bX'XYggYb'9bhk]W_`i b[g]bX'Ui Z'XYf'?fY]gnY]hi b['Y]bgY\VUf"

8 YhU]`g	
Cfh	< UggY`ž'8Yi hgW\`UbX
EiY``Yb	k k k "_fY]gnY]hi b["XY
	k k k "Z`i YWX h`]b[gX]U`c[Y"XY

6Ygi WXYb G]Y i bg Ui Z. a Y]b!k]Yb bYh