

BUh]cbU`dUf_'A`^Yh'f\bgY``A`^Yhž'?fcUh]Yb\b''\sibX'ni 'gY\Yb

9bhXYW_Yb^G]Y^U^Ygžk Ug^G]Y^ØVYf^XYb^BUh]cbU`dUf_A^Yh
Ui Z'XYf^_fcUh]gWXYb→gY^A^Yh^k]ggYba ØggYb**:]bXYb^G]Y
X]Y^VYghYb^<][\^][\hg^\YfUi gžY]bgW\^]Y^*]W^XYf^Hcd!
5_h]j]hÀhYb^i bX^!GY\Ybgk ØfX][_Y]hYb^*8 Yf^BUh]cbU`dUf_
A^Yh^]ghY]b^k i bXYfgW\ObYf^DUf_žXYf^XYb^[fO) hYb^HY]^XYg
bcfXk Ygh^]W\Yb^HY]^g^XYf^→bgY^A^Yh^]b^?fcUh]Yb^UVXYW_h*
CVk c\^XYf^A^Yh!BUh]cbU`dUf_j cf^U^Ya ZØf*gY]bY^VY]XYb
a U^Yf]gW\Yb^GU`nk UggYfgYYb^VY_Ubbh^]ghž^\UhYf^j]Y^ni
V]YhYbžXUfi bhYf^X]Y^9f_i bXi b[^XYf^I ZYfk Y[Ya]hXYa
: U\ffUXžK UbXYfb^i bX'<O\^YbZcfgWki b[**+b^X]YgYa
FY]gYZØ\fYfYbh\Ø^Y^]W\AbYb^X]Y^VYghYb^5_h]j]hÀhYb^]a
BUh]cbU`dUf_A^Yhgck]Y^Y]b][Y^bØhn`]W\Y^H]ddg^i bX
♣bZcfa Uh]cbYb^XUfØVYfž*k]Y^G]Y^\]Yf\Yf^_ca a Ybž*k Ug^G]Y
/ Ua d^Y`]d/

9bhXYW_Yb'G]Y'U``Ygž'k Ug'G]Y'ØVYf'XYb'BUh]cbU`dUf_'A `Yh'Ui Z'XYf_fcUh]gW\Yb'=bgY``A `Yh'k]ggYb'a ØggYb":]bXYb'G]Y'X]Y'VYghYb <][\`][\hg'\YfUi gž'Y]bgW\`]Y»`]W\'XYf'Hcd!5_h]j]hÀhYb'i bX!GY\Ybgk ØfX][_Y]hYb°

8 Yf'B Uh]cbU`dUf_'A `Yh']gh'Y]b'k i bXYfgW\ÒbYf'DUf_ž'XYf'XYb [fÒ» hYb'HY]`'XYg'bcfXk Ygh`]W\Yb'HY]`g'XYf'⊕gY`'A `Yh']b'?fcUh]YbUVXYW h"

CVk c\`XYf'A`Yh!BUh]cbU`dUf_'j cf'U``Ya 'ZØf'gY]bY'VY]XYb a U`Yf]gW\Yb'GU`nk UggYfgYYb'VY_Ubbh']ghž'\Uh'Yf'j]Y``ni 'V]YhYbž XUfi bhYf'X]Y'9f_i bXi b['XYf'l ZYfk Y[Y'a]h'XYa ': U\ffUXž K UbXYfb'i bX'<Ò\`YbZcfqW\i b["

 $\pm b \times X] Y g Y a \quad F Y] g Y Z \emptyset \setminus f Y f \cdot Y b h \setminus \emptyset \cdot Y \cdot] W \cdot \Rightarrow b Y b \cdot X] Y \cdot V Y g h Y b \cdot 5 _ h] j \quad] h A h Y b \\ [a \quad B U h] c b U \cdot d U f _ \cdot A \cdot Y h \cdot g c k \quad] Y \cdot Y] b] [\quad Y \cdot b \emptyset h n \cdot] W X Y \cdot H] d d g \cdot i \quad b X$

±bZcfa Uh]cbYb'XUfØVYfž'k]Y'G]Y'\]Yf\Yf'_ca a Ybž'k Ug'G]Y Yfk UfhYh'i bX'k c'G]Y'ØVYfbUW\hYb'_ÒbbYb"

, VYf XYb B Uh]cbU`dUf_ A `^Yh fi? fcUh]YbŁ

: Øf`XYb`Ni [Ub[`ni a `DUf_`VYbÒh][Yb`X]Y`Òfh`]W\Yb`6Y\ÒfXYb`Y]bY 9]bhf]hhg_UfhYž`X]Y`G]Y`Ub`Y]bYa `?]cg_`]b`GcVfUž`Dca YbU`cXYf Dc`UéY`_Ui ZYb`_ÒbbYb"

9]bhf]hhg[YVØ\f'ZØf'XYb'BUh]cbU`dUf_'A `Yh'+\$'?i bU'fWU"'- ž& 9i fc ξ^2 ZZbi b[gnY]hYb.', "\$\$'V]g'&\$"\$\$'I \f'fkcW\gU]gcb\ti bX'- "\$\$ V]g'%+"\$\$'I \f'fBYVYbgU]gcb\t

8]Y'k]Wkh][ghYb'bUhØf`]WkYb'5hhfU_h]cbYb'X]YgYg'BUhi fdUf_g'g]bX X]Y'VY]XYb'GU`nk UggYfgYYb'JY`]_c'*\nYfc'fl fc\(\text{Yf'GYYE''}\) bX'A U`c'\\JnYfc'fl'Y]bYf'GYYE''8]YgY'GYYb'VYXYW_Yb Y]bY'[fc\(\text{Y': `AWkY']}\) cb'Yhk U'('?]`ca YhYfb''

8 UfØVYf`\]bUi g`Z]bXYb`6Ygi W\Yf`]bbYf\U`V`XYg`JY`]_c`¾nYfc`Y]bY _`Y]bY`=bgY``bUa Ybg`Gj YhU`A Uf]'U`cXYf`=g`Yh`A Y`]hUž'Ui Z`XYf`g]W\ Y]b`k i bXYfgW\ObYg`Y\Ya U`][Yg`6YbYX]_h]bYf_`cghYf`Ui g`XYa `%&" \$J\f\i bXYfh`bUa Ybg`7f_j U`Gj YhU`A Uf]'Y`VYZ]bXYh"

5bZU\fh'ni a 'BUh]cbU`dUf_'A `'Yh

5`g`gØX`]W\ghY`XYf'[fÒ»YfYb'_fcUh]gW\Yb'\bgY`b'a ØggYb'FY]gYbXY Y]b'6cch'bY\a Ybži a 'bUW\'A `Yh'ni '[Y`Ub[Yb"

8]Y'VY']YVhYghYb'K Y[Yž'i a '\]Yf\Yf'ni'[Y`Ub[Ybž'g]bX'Y]bY'XYf VY']YVhYb'_fcUh]gW\Yb'?fYi nZU\fh'i bX'GY[Y`fci hYbž'XUg'7\UfhYfb \Rightarrow fYg'Y][YbYb'6cchYg'cXYf'Y]b'HU[YgUi gZi ['j cb'8i Vfcj b]_'cXYf XYb'bU\Y'[Y`Y[YbYb' \Rightarrow gY`b"

9g'[]Vh'_Y]bYb'cZZ]n]Y``Yb'9]b[Ub['ni a 'DUf_"'GhUhhXYggYb'_ÒbbYb 6Ygi WXYf'XYb'BUh]cbU`dUf_'a]h'XYa ': U\ffUX'cXYf'HUI]'j ca < Ui dh\UZYb']b'GcVfU'cXYf'ØVYf'X]Y'9]b[Àb[Y']b'Dca YbU'i bX Dc`UéY'VYhfYhYb"

 $\exists a : c [YbXYb [Y Y]W Yhk Ug XYhU]]YfhYf Ui Z YXY X]YgYf Cdh]cbYb Y]b"$

 $%"5iZY]bYf?fcUh]Yb!GY[Y`_fYinZU\fh]$

 $8Yf'VY]'kY]hYa 'VYghY'K Y[\check{z}'i a 'U```X]Y'YfghUi b`]WXYb'<][\`][\hg$

8 U`a Uh]Ybg'ni 'gY\Ybž']gh'X]Y'6i W\i b['Y]bYf'?fcUh]Yb! $GY[Y`_fYi nZU\fh'']$

CVk c\`'Yg'j]Y`Y'ni f'5i gk U\`'[]Vhž\UVY']W\'Y]bY'[fc » Ufh][Y 9fZU\fi b['a]h'GU]`'7fcUh]U'[Ya UW\h''8]YgYg'I bhYfbY\a Yb'[]`h'U`g Y]bYg'XYf'VYghYb'Ub'XYf'5Xf]U'i bX'V]YhYh'a Y\fYfY'GW\]ZZg!'i bX GY[Y`cdh]cbYb'Ubž'XUfi bhYf'BUj][Uhcf'fZØf'DUfhmgŁž'9I d`cfYf'fZØf 5VYbhYi YfŁ'i bX'9`Y[UbWY'fZØf'@iligŁ"

I a ']b'Y]bYf'GY[Y`k cW\Y'gc'j]Y`'k]Y'a Ò[`]W\'ni 'gY\Ybž\UVY']W\
a]W\'ZØf'X]Y'9I d`cfYf!?fYi nZU\fh'j cb'8i Vfcj b]_'bUW\'Gd`]h
YbhgW\]YXYb'i bX'Ua 'nk Y]hYb'HU[']b'A `Yh'< U`h'[Ya UW\h''

&"'HU[YgUigZ`i['jcb'8iVfcjb]_ž'?cféi`U'cXYf

9]bY'k Y]hYfY'[fc»Ufh][Y'Cdh]cbž'i a 'bUW\'A`Yh'ni '[Y`Ub[Ybž']gh Y]b'HU[YgUi gZi ['j cb'8i Vfcj b]_'cXYf'Y]bYf'XYf'UbXYfYb VY`]YVhYb'\dagY`b"

5 i Z[fi bX 'XYf'9bhZYfbi b['g]bX 'X]Y 'a Y]ghYb 'X]YgYf'Hci fYb 'Y]bY [UbnhÀ[][Y '5b[Y `Y[Yb \ Y]hž'k Ug'[fc » Ufh][']ghž'XU 'G]Y 'i bhYfk Y[g Ui W\ 'j]Y `'j cb 'XYf'_fcUh]gW\ Yb '? ØghY 'gY \ Yb 'k YfXYb "

FY]gYh]dd. K Ybb G]Y g]W]b 8 i Vfcj b]_k]YXYfZ]bXYbž ZØ\fhFcVYfh j cb <]XXYb A Uf]bY Y]bY XYf Ua VYghYb VYk YfhYhYb

GW\bY``VcchhcifYba]h'XYf'Cdh]cb'XifW\ž'XYbBUh]cbU`dUf_'A`YhibX'X]Y'VYfØ\ahY'CXmggYig!<Ò\`Y'ni'VYgiW\Yb"

' " 2 ZZY b h $^{^{\circ}}$] WX Y $^{\circ}$: À \ fY

9]bYg'XYf'[fc»Ufh][Yb'8]b[Y'VY]a 'FY]gYb'Ui Z'XYb'_fcUh]gW\Yb ±bgY`b']gh'XUg'i a ZUb[fY]W\Y'BYhn'ÒZZYbh`]W\Yf': À\fYb"

G]Y Z]bXYb a Y\fYfY: À\fj YfV]bXi b[Yb bUW\ A`Yh'j cb CfhYb k]Y 6c`'fbfUWŁZ'8i Vfcj b]_Z'<j UfZ'Gd`]h'i bX GhUf]'; fUX": À\fY ni f'bU\Y'[Y`Y[YbYb'\DgY``J]g

$? UfhY XYg B Uh]cbU dUf_g A ^Yh$

8]Y'[fØbY'\dgY``A`Yh'YfghfYW_h'g]W\'ØVYf'Y]bY'n]Ya`]W\'[fc»Y: `ÀW\Y'a]h'aY\fYfYb'Ugd\U`h]YfhYb':i»!'ibX'FUXkY[Yb'gck]YY]bYf'J]Y`nU\`'jcb'KUbXYfkY[Yb"

I bhYb ']gh'X]Y '? UfhY 'XYg'B Uh]cbU'dUf_g'A `Yhž'X]Y 'G]Y ']b 'XYf'BÀ\Y XYg'9]b[Ub[g'Z]bXYb"'8]YgYf'i a ZUggh'XYb'[YgUa hYb B Uh]cbU'dUf_ž'XYf'XUg'cVYfY'8f]hhY`'XYf'&pgY`'Ui ga UW\h"'G]Y k YfXYb 'ZYghghY``Ybž'XUgg'Ui W\'X]Y'K UbXYfk Y[Y'Ui Z'X]YgYf'? UfhY

5_h]j]hÀhYb]a BUh]cbU`dUf_ A `Yh

@UggYb'G]Y'i bg'U`gcž'bUWXYa 'X]Y'@c[]gh]_'Ui g'XYa 'K Y[[YfÀi a h']ghž']b'X]YgY'@]ghY'XYf'5_h]j]hÀhYb']a 'A`Yh!BUh]cbU`dUf_ž ?fcUh]Ybž'Y]bhUi WXYb°

 $K \]Y \ `G]Y \ `ZY ghghY ``Y b \ `k \ Y f X Y b \ \check{z}']gh \ `XY f \ `B \ Uh]c b \ U`d \ Uf _`A \ `Y h \ `Y]b \ Y f \ XY f \ gWX \ ObghY b \ `B \ Uh]c b \ U`d \ Uf _g']b \ `? f c \ Uh]Y b \ `i \ b X \ `i \ b h Y f gWX \ Y]X Y h \ `g]WX \ `Y]b \ k \ Y b][\ 'j \ c b \ `Ub X Y f Y b \ `V Y `]Y V h Y b \ `C f h Y b \ `k \]Y \ `D`]hj \]WY \ `i \ b X \ `? f _U"$

I a 'X]Y'a Y]ghYb'VY`]YVhYb'5hhfU_h]cbYbž'5i gg]W\hgdi b_hY'i bX; Y[YbXYb'ni 'VYgi W\Ybž'Ya dZY\`Y']W\ž'Y]bYb'[UbnYb'HU['\]Yf'ni j YfVf]b[Yb"

%"`A]YhYb`G]Y`Y]b`: U\ffUXž`i a `XYb`BUh]cbU`dUf_ ni `Yf_i bXYb

 $6Y]^{k}Y]^{h}Ya^{-1}]^{gh}Y]^{b}Y^{x}Yf^{v}YghYb^{v}A^{(-1)}W^{-1}]^{h}Ybz^{v}XYb^{v}A^{(-1)}Yh^{v}$

BUh]cbU`dUf_'ni 'Yf_i bXYbž'Y]b': U\ffUX'ni 'a]YhYb"

8 Ug``]Y[h'XUfUbž'XUgg`Yg`j]Y`Y`K UbXYfk Y[Y`[]Vhž'X]Y`g]W\`dYfZY_h ni a `FY]hYb`i bX`9f_i bXYb`Y][bYb"'Gc`g]bX`k]f`]a `DUf_ \Yfi a [Y_ca a Ybž'i bX`]W\`kØfXY`Yg`ZØf'i bYf`Àgg`]W\`\U`hYbž kYbb`G]Y`a Y\f'U`g'bi f'X]Y`<Ui dhqYYb`VYgi W\Yb`a ÒW\hYb"

&"AU`c'>YnYfc'fKYf'_`Y]bY'GYYŁ

A U`c'\nYfc']gh'XYf'_`Y]bYfY'XYf'VY]XYb'GU`nk UggYfgYYb']a
B Uh]cbU`dUf_'A`Yh"'8]YgYf'GYY']gh'YXcW\'k c\`'XYf'gW\\ObghYž
Ui Z[fi bX'gY]bYg'\Y``Ybž'hØf_]gZUfVYbYb'K UggYfgž'XUg'a]W\'ZUgh
Ub'X]Y'Gi [VU!@U[i bY'Ui Z'XYb'D\]`]dd]bYb'Yf]bbYfhY"

G]Y'_ÒbbYb'XYb'Ài » YfYb'l a ZUb['X]YgYg'_`Y]bYb'GYYg'i a fi bXYb i bX'gWk]a a Yb']gh'Yf'Ui Vh"

' "'J Y`]_c'>YnYfc'fBYf'[fc»Y'GYYŁ

JY`]_c`¾nYfc`]gh'XYf'[fc»Y'GYY']a 'BUh]cbU`dUf_'A`Yh"'8ifW Y]bYb'gWXaU`Yb'?UbU`'jYfVibXYbž']gh'JY`]_c'¾nYfc'j]Y`'[fÒ»Yf ibX'h]YZYf'U`g'AU`c'¾nYfc"'9bh`Ub['XYg'FUbXYg'Z]bXYb'G]Y'j]Y`Y gWXÒbYž'UV[Y`Y[YbY'6UXYghY``Ybž'X]Y'gY\f'Y]b`UXYbX'g]bX"

("'6YbYX]_h]bYf_`cghYf'Ui Z'XYf'=bgY`'Gh"'A Ufm f∏f_j U'Gj "'A Uf]^UŁ

9]bY'XYf'VYghYb'5_h]j]hÀhYb']a 'BUh]cbU`dUf_'A`Yh']gh'XYf'6Ygi WXXYf'±bgY`'Gh"'A Ufm'fGj YhU'A Uf]'UŁ"

8]Ygʻ]ghʻY]bYʻ_`Y]bYʻ≠bgY``]bʻY]bYaʻ6i WkhUVgWkb]hhʻj cbʻJY]_c ≯nYfcʻfKYaʻ[fc»YbʻGYYŁ"

I a `\]Yf\Yf`ni `[Y`Ub[Ybž'a ØggYb`G]Y`Y]bY`_i fnY`6cchgZU\fh'j ca FUXk Y[`cXYf'j ca `: À\f\UZYb`Df]ghUb]ghY`Ui g`i bhYfbY\a Yb`i bXXYb`[fc»Yb`GYY`]b`XYf`A]hhY`ØVYfei YfYb"

 $< U`hYb`G]Y`ZØf`X]Y`Yb][Yb`Ui~Z`XYa~:i * k~Y[~5i~ggWk~Ui~bUWk~Y]bYf~fc~hYb~:`U[~[Yž`X]Y`G]Y`Ui~Z`\YVYb~i~bX`k~]b_Yb~_O`bbYbž`i~a~`XYb~6cc~hgZU`\fYfb~ni~g][~bU`]g]YfYbž`G]Y`UVni~`c`Yb"~8~]YgY~:~A`\fY~]gh`]b~ A fYf`9]b~f]h~b~UfhY~Yb~k~U`hYb~i~bX~G]Y~a~ØggYb~XU\Yf~_Y]bY~ni~gA~hn`]Wk~Yb~?~cghYb~nU``Yb"$

GcVU`X'G]Y'Ui Z'XYf'_`Y]bYb'\dagY``Ub[Y_ca a Yb'g]bX\dotz'_\ObbYb'\G]Y XUg'U`hY'?`cghYf'i bX'XUg'Ub[YgW\`cggYbY'\FYghUi fUbh'\Yf_i bX\Yb" 8]Yg']gh'Ui W\'Y]b'[fc>\Ufh][Yf'Cfh'ni a 'GW\k]a a Yb'\daga'

) "A U`] A cghf8]Y _ `Y]bY 6fØW_YŁ

5a 'Ògh`]W\Yb'9bXY'XYg'[fc»Yb'GYYg'Z]bXYb'G]Y'A U`]'A cgh fØVYfgYhnh'_`Y]bY'6fØW_YŁŽ'Y]bY'U`hY'6fØW_YŽ'X]Y'Y]bYb'gW\a U`Yb ?UbU`'ØVYfei Yfh"

¾ hnh'X]Ybh'A U`]'A cgh'bi f'bcW\'U`g'k YgYbh`]W\Yf'HY]`'XYf'Fci hYž

X]Y'X]Y'GYYb'i a fi bXYhž'UVYf'Yg']gh'Ui W\'Y]b'[fc» Ufh][Yf'C fh'ni a

GW\k]a a Yb"'5i Z[fi bX'XYg'gW\a U`Yb'K UggYfXi fW\[Ub[g'k YfXYb

X]Y'; YnY]hYbghfÒa i b[Yb'gY\f'ghUf_ž'k Ug'VYXYi hYhž'XUgg'G]Y']b

XYb'GYY'\]bY]b!'i bX'\YfUi ghfY]VYb'_ÒbbYb"

AU`]'Acgh']b'gY]bYf'ifgdfØb[`]WXYb':cfa

* " K UbXYfb G]Y X]Y $< \emptyset[Y$ \setminus]bUi Z

K UbXYfb']gh'Y]bY'XYf'< Ui dhU_h]j]hÀhYb']a 'BUh]cbU`dUf_'A `Yh'' K Ybb'G]Y'ni f'cV][Yb'?UfhY'\cW\gWfc``Ybž'gY\Yb'G]Y'j]Y`Y a Uf_]YfhY'Fci hYbž'bÀa `]W\'5ž'6ž'7ž'8'i bX'9"'8]Yg'g]bX'[i h [YdZY[hY'GhfYW_Yb'a]h'Ui ZZÀ``][Yb'A Uf_]Yfi b[Ybž'X]Y'Yg'ZØf'U``Y?ÒbbYfqhi ZYb'`Y]W\h'a UW\Ybž']\bYb'ni 'Zc`[Yb"

 $8 \ U'k \]f'bi \ f'Y]bYb'HU[']a'DUf_'\UhhYbž'VYgW\`cggYb'k \]fž'Ui \ Z'XYb'\OW\ghYb'<0[Y``ni 'k UbXYfbž'XYf'XYb'GU`ngYYb'Ua'b\AW\ghYb'\]Y[h''8]YgYf'K Y['\Y]» h'A h'''A cbhc_i Wi bX']gh'Y]b'[f\ØbYf'<\O[Y`ZXYf'a]h'5`Yddc!?]YZYfbk U`X'VYXYW_h']gh'i bX'Y]bY'<\O\Y'j cb'\&) *$

H]dd. 'GWfc ``Yb 'G]Y 'ni a '5bZUb['X]YgYg'6Y]hfU[gž'i a 'X]Y K UbXYf_UfhY 'Ubni nY][Yb"

$+ \text{``Gd]`]WY! < O\ \ Y$

8]YgY'<Ò\`Y'\Y]» h'i bX'fY]W\h'V]g']b'Y]bY'H]YZY'j cb'a]bXYghYbg'+\$
A YhYfb"'I a '\]Yf\Yf'ni '[Y`Ub[Ybž'Zc`[Yb'G]Y'XYa '[YdZUghYfhYb
K Y['bUW\fYW\hgž'bUW\XYa 'G]Y'A U`]'A cgh'Ui Z'Y]bYf'Fci hY'[Y[Yb
XYb'I\fnY][Yfg]bb'XYg'GYYg'ØVYfei Yfh'\UVYb"

 $: U \setminus fYb \cdot G]Y \cdot Yhk \cdot U \cdot ' \cdot \$\$ \cdot A \cdot YhYf \cdot k \cdot Y]hYf \cdot i \cdot b \cdot K \cdot G]Y \cdot k \cdot YfXYb \cdot Y]bYb \cdot _`Y]bYb$ $DZUX \cdot gY \setminus Yb \check{z} \cdot XYf \cdot b \cdot UW \cdot c \cdot VYb \cdot i \cdot b \cdot X \cdot]b \cdot XYb \cdot K \cdot U \cdot X \cdot Z\emptyset \setminus fh'' \cdot \# \cdot k \cdot Yb][\cdot Yf \cdot U \cdot g \cdot Y \cdot YffY]W \cdot Yb \cdot G]Y \cdot XYb \cdot 9]b[\cdot Ub[\cdot ni \cdot f' < \mathring{O} \setminus Y\check{z} \cdot X]Y \cdot G]Y \cdot b \cdot UW \cdot GY \cdot YYb \cdot VYhfYhYb \cdot i \cdot b \cdot XYf_i \cdot b \cdot XYb \cdot _\mathring{O}bbYb''$

XU\Yf'k ØfXY']W\'Ya dZY\`Ybž'Y]bY'Gh]fb`Ua dY'a]hni bY\a Ybžk Ybb'G]Y'Y]bY'\UVYb°

, "'6Ygi WXYb'G]Y'; cj YXUf]ž'Dca YbUž'Dc`UéY'i bX Gc`]bY

a 'B Uh]c b U`d Uf_'A `Yh'[]Vh'Yg'a Y\fYfY'_`Y]b Y '8 ÒfZYf"'8]Y 7\Ub WYb 'ghY\Yb'[i hž'X Ugg'G]Y'Ui Z'XYa 'K Y['a]h'XYa ': U\ffUX'Ub a Y\fYfYb'XUj cb'j cfVY]_ca a Yb"'8]Y'VYa Yf_Ybgk YfhYghYb 8 ÒfZYf']bbYf\U`V'XYg'DUf_g'i b X'gY]bYf'I a [YVi b['g]bX'; cj YXUf]ž Dca YbU'i b X'Gc`]bY"

<]Yf'Z]bXYb'G]Y'j]Y`Y``c_U`Y'FYghUi fUbhgž'Gci j Yb]f`ÀXYb'i bX
`c_U`Y'<Ài gYf"</pre>

9gʻ]ghʻUi Waʻa Ò[`]Wažʻgdcfh`]Wayʻ5_h]j]hÀhYbʻni ʻVi WaybžʻXUfi bhYf ?UʻU_j Yf`Y]\ ʻfbXYfʻ!hci fYbŁžʻY]bYʻK UbXYfhci fʻcXYfʻY]bY 6cchghci fʻj cbʻDca YbUʻUi gʻ'

- "'C X mggYY! < Ò\ `Y

 $C\ V\ k\ c\ ``X]Y`<\dot O\ `Y`XYf`C\ XmggYY`hYW\ b]gW\ `[\ YgY\ Yb`_Y]b`HY]``XYg \\ B\ U\ h]c\ b\ U\ `d\ Uf_g`A\ `Yh`]ghz`]gh`g]Y`Y]bY`XYf`[fO` hYb`5hhfU_h]cbYb`XYf \\ = bgY`"$

8]YgY'<Ò\`Y']gh'j cb'XYf'[f]YW\]gW\Yb'A mh\c`c[]Y'Xi fW\Xfi b[Ybžk]Y'g]Y'j cb'Y]bYa']\fYf'[fÒ»hYb'Ubh]_Yb'8]W\hYfž'<ca Yfž'YfnÀ\`hki fXY"'HUhgÀW\`]W\'ghUa a h'XYf'BUa Y'Ui g'XYf'U`hYb'; YgW\]W\hYj cb'C XmggYi g'i bX'7U`mdgc"

G]Y 'Z]bXYb 'X]Y 'A YYfYg\Ò\`Y 'j cb 'C XmggYY 'Ub 'XYf 'gØX`]W\Yb '? ØghY j cb 'A `Yh']b 'XYf 'BÀ\Y 'j cb '6UV]bc 'Dc`Y"'9g '[]Vh'Ui W\ 'j]Y`Y GUbXghfÀbXY ']b 'XYf 'I a [YVi b[ž'U`gc 'fY]bgW\Ui Yb '`c\bh'g]W\ °

%\$"; Yb]Y» Yb G]Y XYb GcbbYbi bhYf[Ub[

±W. XYb_Yža Ub '_Ubb 'a]h'G]W. Yf\Y]h'gU[Ybž'XUgg'A`Yh'X]Y'5fh'j cb Di V`]_i a 'Ubn]Y\hž'X]Y'UVgW.U`hYb'i bX'X]Y'BUhi f'[Yb]Y» Yb a ÒW. hYb"

BUWX 'Y]bYa ``Ub[Yb'HU['a]h'K UbXYfbž'FUXZU\fYbž'?U'U_ZU\fYbcXYf'GY[Y`b']gh'Yg'Y]bYg'XYf'VYghYb'8]b[Yž'X]Y'G]Y']a 'BD'A `Yhhi b'_ÒbbYbž'Y]bZUWX'X]Y'GcbbYbi bhYf[Àb[Y'XYf'XU`a Uh]b]gWXYb \digyY``ni '[Yb]Y»Yb"'5VYbXg']gh'XYf'BUh]cbU`dUf_'`Y]XYf'a Y]ghYbg [YgWX`cggYb"

⇒W. 'Ya dZY\`Y'YXcW\ž'ni a 'D]Yf']b'Dca YbU'\]bi bhYfni [Y\Ybž'i a UhYa VYfUi VYbXY'GcbbYbi bhYf[Àb[Y'ni '[Yb]Y»Yb"

, $VYfbUWA hi b[ga O[`]WA_Y]hYb']a$ B Uh]c b U`d Uf_ 'A `^Yh

9g'[]Vh'nk Uf'j]Y`Y', VYfbUW\hi b[ga Ò[`]W_Y]hYb'Ui Z'XYf' ⊕gY`A`Yhž'UVYf'k Ybb'G]Y'XYb'BUh]cbU`dUf_'Yf_i bXYb'a ÒW\hYbž
Ya dZY\`Y']W\' → bYbž']b'Dca YbUž'Dc`UéY'cXYf'; cj Yí Uf]'ni
ØVYfbUW\hYb"'BUW\Zc`[YbX'Z]bXYb'G]Y'X]Y'VYghYb
I bhYf_i bZhga Ò[`]W_Y]hYb'XYg'BD'A`Yh"

- 5dUfha YbhgʻGʻUj]WUʻʻZUbhUgh]gW\Yʻ5dUfha Ybhgʻbi fʻ& ; Y\a]bi hYbʻj ca 'GhfUbX']b'Dca YbU'YbhZYfbh"
- J]``U'?`UW]bU' 'ZUbhUgh]gW\Y'J]``U'a]h'Dcc``i bX'6`]W_'Ui Z XYb'[fc»Yb'GYY']b'A`'Yh'

A Y\f'?fcUh]Yb'FY]gYZØ\fYf'/
5VYbhYi Yf]bgd]fUh]cb

п

8 Y hU]`c

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