

### : Y]Yf`Ui bY'di f.'9]b'i bj Yf[ Ygg`]WX Yg K cWX YbYbXY']b'XYf'FY[ ]cb

9f`YVYb'G]Y'X]Y'<][\`][\hg'j ca 'K cW\YbYbXY'j ca '%\* "'V]g %, "'5i [i gh']b'XYf'FY[]cb.'?i `hi fž'A i g]\_ $\check{z}$ ': YghY'i bX'a Y\f°

5a 'j Yf[ Ub[ YbYb'K cW.YbYbXY'k Uf']b'XYf'FY[ ]cb'k ]YXYf'Y]b][ Yg `cg"'Jcb'Aig]\_ZYgh]j U`g'V]g'ni '\_i `hi fY``Yb'J YfUbghU`hi b[ Yb' 'X]Y J ]Y`ZU`h'k Uf'VYa Yf\_Ybgk Yfh"'6Ygi W.Yf'Ui g'bU\'i bX'ZYfb ghfÒa hYb'ni 'XYb'j YfgW.]YXYbYb'9j Ybhgž'i a 'Y]bY'i bj Yf[ Ygg`]W.Y NY]h'ni 'Yf'YVYb"'8Yf'GU`]bYbgYY']b'6UX'8Øff\Y]a ž'XUg'\]ghcf]gW. [ YdfÀ[ hY'6UX'8Øff\Y]a 'i bX'j ]Y`Y'UbXYfY'C fhY'VchYb'nU\`fY]W.Y A Ò[ `]W.\_Y]hYb'ni f': fY]nY]h[ YghU`hi b[ "

9]b'<][\`][\h'k Uf'XUg'K ca VUhg!CdYb!5]fž'XUg']a 'a U`Yf]gW\Yb GW\cbUW\Yf'?i fdUf\_'ghUhhZUbX"'5b[Ync[Yb'] cb'XYf'5ha cgd\ÀfY i bX'XYf'A i g]\_'j YfgUa a Y`hYb'g]W\'\i bXYfhY'j cb'Ni \ÒfYfbž'i a X]Y'VY\_UbbhYb'?`Àb[Y'XYf'6UbX' D]b\_': `cmX 'ni '[Yb]Y»Yb"'8]Y 8UfV]Yhi b['k Uf'b]W\h'bi f'Y]b'a i g]\_U`]gW\Yg'9f`YVb]gž'gcbXYfb Ui W\'Y]b'5i gXfi W\_'XYf'; Ya Y]bgW\UZhž'X]Y'Xi fW\'X]Y'A i g]\_ [YgW\UZZYb'k i fXY"

# ?i`hi fY``Y`J YfUbghU`hi b[ Yb`i bX 8]g\_i gg]cbYb

K À\fYbX'A i g]\_'i bX': Y]Yfb'Y]b'[fc»Yf'HY]`XYg'K cW\YbYbXYg k UfYbž'[UV'Yg'Ui W\'h]YZ[fY]ZYbXY'8]g\_i gg]cbYb"'6Y]a '5A G!7Ua d ]b': i fhk Ub[Yb'ghUbXYb'H\Ya Yb'k]Y'XYf'?`]a Uk UbXY`ž'XUg ; YgW\`YW\hYfj Yf\À`hb]g'i bX'XYf'I \_fU]bY!?f]Y[']a ': c\_i g"'8]Y J YfUbghU`hi b['\_ca V]b]YfhY'i bhYf\U`hgUa Y'Dfc[fUa a Y'a]h Yfbgh\UZhYb'; YgdfÀW\Yb'i bX'Yfa Ò[`]W\hY'XYb'HY]`bY\a Yfbž'g]W\ ØVYf'XfÀb[YbXY'[YqY``qW\UZh`]W\Y'H\Ya Yb'Ui gni hUi gW\Yb"

9]b'k Y]hYfYf'\_i `hi fY``Yf'< Ò\Ydi b\_h'ZUbX'VY]a '?i `hi f']a
GhUXh[ UfhYb ']b'GW\]`hUW\ 'ghUhh'' 8]Y'5i hcf]b'i bX'DfcXi nYbh]b
5bbYhhY'FYY\_Yf'YfnÀ\`hY'j cb']\ fYf'5fVY]h'i bX'XYb
9bhghY\i b[ gdfcnYggYb'\]bhYf'XYb'GW\k Ufnk U`X!?f]a ]g"'Gc`W\Y
J YfUbghU`hi b[ Yb'ZÒfXYfb'b]W\h'bi f'XUg'\_i `hi fY``Y'6Yk i gghgY]bž
qcbXYfb'Ui W\'XYb'5i ghUi gW\'nk ]gW\Yb'?Øbgh`Yfb'i bX'Di V`]\_i a "

5a 'GU`]bYbgYY'k i fXY'XUg'GhØW\_' 8cb' → Ub'XUhYX'9j U ']a Gca a Yfh\YUhYf'Ui Z[ YZØ\fh"8]YgYg'GhØW\_'VYk À`h][ hY'Ui Z'\_fYUh]j Y K Y]gY'X]Y'?ca d`YI]hÀh'XYf'@]YVY'Xi fW\'j YfgW\]YXYbY'9dcW\Yb i bX'A i g]\_Yb"'9g'k Uf'Y]b'k Y]hYfYg'6Y]gd]Y`'XUZØfž'k ]Y'?i bgh'U`g Gd]Y[ Y`'XYf'a YbgW\`]W\Yb'9fZU\fi b[ Yb'X]YbYb'\_Ubb"

#### : Y]Yf`]WXY'A ca YbhY'i bX': fY]nY]hj Yf[ bØ[ Yb

6Y] XYb \* V] Ai a gZY]Yf W\_Y]hYb k i fXY ]b < ØZ]b[Yb [YZY]Yfh X]Y &\$" 5i ZU[Y XYg GhfU» Yb ZYghYg `c W\_hY j ]Y Y 6Ygi WX Yf ]b X]Y GhUXhž VYgcb XYfg ]b XYb 5VYb Xghi b XYb ž k Ybb X]Y 8 Aa a Yfi b[ X]Y 5ha cgd \ AfY j YfnUi VYfhY "Gc `WXY : YghY ghAf\_Yb XYb ; Ya Y]bgWX UZhgg]bb i b X Vf]b[Yb A YbgWX Yb ni gUa a Ybž X]Y X]Y : fYi XY i b X XUg @AWX Y b hY] Yb "

9]b'k Y]hYfYg'VY`]YVhYg'9j Ybh'k Uf'XUg'6cW\]b[Yf'6]Yf[UfhYbZYgh" <]Yf'VYXYi hYhY'6`Uga i g]\_'b]W\h'bi f'l bhYf\U`hi b[ž'gcbXYfb'Ui W\Y]b': Ygh'XYf'; YgW\]W\hY'i bX'HfUX]h]cbYb'XYg'CfhYg"'8]Y'[i hYGh]a a i b['Ui Z'XYa': Yghd`Uhn'nY][hYž'k]Y'gY\f'X]Y'A YbgW\Ybgc`W\Y'; Y`Y[Yb\Y]hYb'gW\ÀhnYbž'i a 'g]W\ni 'j YfgUa a Y`b'i bX'ni ZY]Yfb"

I bX'b]W\h'ni 'j Yf[ YggYbž'XUg'K Y]bZYgh']b'9f[ Ybn]b[ Yb''A ]h gh]a a i b[ gj c``Ya '5a V]YbhY'i bX'YX`Yb'HfcdZYb'Ui g'² ghYffY]W\gW\UZZhY'XUg': Ygh'Y]bY'Y]b`UXYbXY'5ha cgd\\AfYž'X]Y'nU\`fY]W\Y 6Ygi W\Yf'Ubnc[ ž'X]Y'XUg'K cW\YbYbXY'[ YVØ\fYbX'Ui g\_`]b[ Yb`UggYb'k c``hYb"

9]b'k Y]hYfYg'9j Ybh'XYf'VYgcbXYfYb'5fh'k Uf'XUg'7UbX`Y`][\h! GWk]a a Yb']a '<U][Yf`cWkYf': fY]VUX"'Hfchn'XYg'b]Wkh'[YfUXYY]b`UXYbXYb'K YhhYfg'ZUbXYb'j]Y`Y'XYb'K Y['ni'X]YgYf

VYgcbXYfYb'JYfUbghU`hi b['i bX'[YbcggYb'X]Y'VYgcbXYfY 5ha cgd\ÀfY"

8 UgʻGdf]hnYfZYgh]j U``]bʻCghXcfZʻghUbXʻYVYbZU``gʻUi ZʻXYfʻ5[YbXU" A]hʻgdUbbYbXYbʻ@ÒgWkYhh\_Àa dZYbʻi bXʻ[YaY]bgUa Ybʻ, Vi b[YbVfUWkhYʻYgʻ: Yi Yfk Y\fʻi bXʻ7ca a i b]hmʻni gUa a Ybži a ʻb]Wkhʻbi f : À\][\_Y]hYbʻi bhYfʻ6Yk Y]gʻni ʻghY``YbžʻgcbXYfbʻUi WkʻXYbHYUa[Y]gh'ni ʻghÀf\_Yb"

8 UgʻA chcffUXhfYZZYbʻXYgʻ7`i Vgʻ%-,, '< UfXhʻk UfʻY]bʻk U\fYg GdY\_hU\_Y`a ]hʻU``Yf`Y]: U\fnYi [Ybʻjcbʻ\_`Ugg]gW\YbʻA cXY``YbʻV]g \]bʻni a cXYfbYbʻA UgW\]bYb"8]YʻfY[YʻHY]`bU\a Yʻi bXʻj cfʻU``Ya XYfʻ5i ghUi gW\nk ]gW\YbʻXYbʻA chcffUXZfYi bXYbʻa UW\hYbʻXUg HfYZZYbʻni 'Y]bYa '9j YbhžʻXUgʻXYbʻ9bh\i g]UghYbʻj ]Y`: fYi XY VYfY]hYhY"

8]Y'JYfUbghU`hi b[Yb'XYg'`YhnhYb'K cW\YbYbXYg'\UVYb'Y]b
j]Y`ZÀ`h][Yg'6]`X'XYf'\_i `hi fY``Yb'i bX'gcn]U`Yb'5\_h]j]hÀhYb']b'XYf
FY[]cb'[YnY]W\bYh''G]Y'nY][Ybž'k]Y'k]W\h]['gc`W\Y'9jYbhg'ZØf'X]Y
; Ya Y]bgW\UZh'i bX'XUg'\_i `hi fY``Y'@YVYb'g]bX'i bX'V]YhYb'Y]bY
[fc»Ufh][Y'; Y`Y[Yb\Y]hž'g]W\'ni 'j YfbYhnYb'i bX'GdU»'ni '\UVYb''

## J]Y`ZU`h'XYf'JYfUbghU`hi b[Yb'VY[Y]ghYfh'X]Y FY[]cb

8]YgY'J]Y`nU\``Ub'JYfUbghU`hi b[Yb']gh'b]W\h'bi f'Y]bY': Y]Yf'XYf?i `hi f'i bX'XYg'@YVYbgž'gcbXYfb'Ui W\'Y]b'NYi [b]g'ZØf'X]Y'J]hU`]hÀh XYf'; Ya Y]bgW\UZh']b'XYf'FY[]cb"'9g']gh'Yfa i h][YbX'ni 'gY\Ybž'k]Y j]Y`Y'A YbgW\Yb'VYfY]h'g]bXž'g]W\'ni 'Yb[U[]YfYbž'ni 'ZY]Yfb'i bX U\_h]j 'Ub'XYb'j YfgW\]YXYbYb'5b[YVchYb'hY]`ni bY\a Yb"'\dangle Y]bYf NY]hž']b'XYf'Ni gUa a Yb\U`h'i bX'; Ya Y]bgW\UZh'k]W\h][Yf'XYbb'Y g]bXž'V]YhYb'gc`W\Y'9j Ybhg'Y]bYb'FUi a 'ZØf'6Y[Y[bi b['i bX'; fYi XY"

8]Y'J]Y`ZU`h'XYf'JYfUbghU`hi b[Yb']b'XYf'FY[]cb'gd]Y[Y`h'b]W\h'bi f X]Y'\_i `hi fY``Y'@YVYbX][\_Y]h'k]XYfž'gcbXYfb'\Uh'Ui W\'VYXYi hYbXY k]fhgW\UZh`]W\Y'5i gk]f\_i b[Yb"'Gc'n]Y\h'XUg'K ca VUhg!CdYb!5]f ]a 'GW\cbUW\Yf'?i fdUf\_'b]W\h'bi f'A i g]\_`]YV\UVYf'Ubž'gcbXYfb [YbYf]Yfh'Ui W. '9]bbU\a Yb'ZØf'`c\_U`Y'; YgW.ÀZhY'i bX'; UghghÀhhYb" JYfUbghU`hi b[Yb'k]Y'XUg'6]Yf[UfhYbZYgh']b'6cW.]b[Yb'cXYf'XUg K Y]bZYgh']b'9f[Ybn]b[Yb'V]YhYb'Y]bY'D`UhhZcfa 'ZØf'`c\_U`Y 5bV]YhYfž']\fY'DfcXi\_hY'ni 'dfÀgYbh]YfYb'i bX'bYi Y'?i bXYb'ni [Yk]bbYb"

#### ?i `hi fY``Y'J YfUbghU`hi b[Yb'U`g'gcn]U`Yf'?]hh

9]b 'gdYn]Z]gWXYf'J cfhY]``\_i `hi fY``Yf'J YfUbghU`hi b[Yb']b 'XYf'FY[]cb ]gh']\fY': À\][\_Y]hž'A YbgWXYb 'i bhYfgWX]YX`]WXYf'<Yf\_i bZh ni gUa a Ybni Vf]b[Yb"'<]YfVY] 'gWX UZZYb '9j Ybhg'k ]Y 'XUg'A ]hhY`U`hYf! GdYWhUW'`i a ']b '8 cVY`cXYf'X]Y'j YfgWX]YXYbYb'a i g]\_U`]gWXYb 8 UfV]Yhi b[Yb'b]WXh'bi f'I bhYf\U`hi b[žgcbXYfb'ZÒfXYfb'Ui WX'XYb 5i ghUi gWX'nk ]gWXYb'XYb'6Ygi WXYfb"'8 Ug'Vf]b[h'b]WXh'bi f': fYi XYž gcbXYfb 'YfÒZZbYh'Ui WX'X]Y'A Ò[`]WX\_Y]hž'bYi Y': fYi bXgWX UZhYb'ni gWX`]Y»Yb'i bX'`c\_U`Y'HfUX]h]cbYb'k Y]hYfni [YVYb"

9]b YZZY\_h]j Yg 6Y]gd]Y ZØf XYb gcn]U Yb Ni gUa a Yb\U'h Xi fW\
\_i `hi fY``Y J YfUbghU`hi b[Yb ]gh XUg : ØfY]b Ub XYf XUgY]b ]a 'F U\a Yb
XYg GU`]b Ybg YY! H\YUh Yfg ]b '6 U X '8 Øff\Y]a z k c 'X Ug Gh Ø W\_ 8 cb

\$\forall \ub XUh Y X '9 j \ub 'h\Ya \ub h Ya \ub h \ub h Ya \ub h Ya \ub h \ub h \ub h Ya \ub h \ub h \ub h Ya \ub h \ub h Ya \ub h Ya \ub h \ub h

#### K $]fhgWX UZh^*]WX Y 5i gk <math>]f_i b[Yb j cb 9j Ybhg]$

 $8\,]Y\,fY[\,\,]c\,b\,U\,Y\,b\,'J\,Y\,fU\,b\,ghU\,'hi\,\,b\,[\,\,Y\,b\,'V\,]Y\,hY\,b\,'n\,U\,\backslash\,\,fY\,]WX\,Y\,'k\,\,]fhgWX\,UZh\,']WX\,Y\,'h$ 

JcfhY]`Y"'@Ui h'Y]bYf'Ghi X]Y'XYg'8Yi hgWXYb'Hci f]ga i gj YfVUbXg f8 HJ Ł'hfU[Yb'\_i `hi fY``Y'i bX'gdcfh`]WXY'9j Ybhg'YbhgWXY]XYbX'ni a I a gUhn']a '`c\_U`Yb'<UbXY``VY]"'8i fWX'X]Y'5bn]Y\i b['j cb 6Ygi WXYfb'Ui g'bU\'i bX'ZYfb'k YfXYb'b]WXh'bi f'<chY`!'i bX; UghghÀhhYb[Yk YfVY'i bhYfghØhnhž'gcbXYfb'Ui WX'9]bnY`\ÀbX`Yf dfcZ]h]YfYb'j cb'XYf'Yf\Ò\hYb'6Ygi WXYfnU\`"'9]b'\_cb\_fYhYg 6Y]gd]Y``]gh'XUg'<ØZ]b[Yf'GhfU» YbZYghž'XUg'b]WXh'bi f'Xi fWX 9]bhf]hhg[Y`XYfž'gcbXYfb'Ui WX'Xi fWX'I a gUhn'XYf'`c\_U`Yb'<ÀbX`Yf [YgWXÀhnh'k]fX"

9]b][Y'GW\Ahni b[Yb'`Y[Yb'bU\Yž'XUgg'XYf'k]fhgW\UZh`]W\Y'9]bZi gg gc`W\Yf'JYfUbghU`hi b[Yb'; YgUa hY]bbU\a Yb']a 'gYW\gghY``][Yb 6YfY]W\'[YbYf]YfYb'\_Ubb"'6YXYb\_Yb'gc``hY'a Ub''YXcW\ž'XUgg'XYf 9fZc`['Y]bYg': Ygh]j U`g'ghUf\_'j cb'XYf'D`Ubi b['i bX'XYf'K YfVi b[UV\Ab[h/'YfZc`[fY]W\Y'JYfUbghU`hi b[Yb'g]bX'cZh'X]Yž'X]Y'ZfØ\nY]h][a]h'XYf'Dfca ch]cb'VY[]bbYb'i bX'Y]bY'UhhfU\_h]j Y'A]gW\i b['Ui g 5\_h]j ]hAhYb'i bX'\_i`]bUf]gW\Yb'5b[YVchYb'VYfY]hghY``Yb"

8]Y: cfhZØ\fi b['i bX'I bhYfghØhni b['X]YgYf'9j Ybhg'g]bX
YbhgWXY]XYbX'ZØf'X]Y'5i ZfYWXhYf\U`hi b['XYg'\_i `hi fY``Yb'@YVYbg
i bX'XYg'k]fhgWXUZh`]WXYb'K c\`ghUbXg']b'XYf'FY[]cb"
GhUXhj Yfk U`hi b[Yb'gck]Y'`c\_U`Y'JYfVÀbXY'g]bX'Ui Z[YZcfXYfhž']b
X]Y: ÒfXYfi b['gc`WXYf'+b]h]Uh]j Yb'ni ']bj Ygh]YfYbž'i a 'Ui WX']b
Ni \_i bZh'Y]bY'`YVYbX][Y'; Ya Y]bgWXUZh'ni '[Yk À\f`Y]ghYb"
JYfUbghU`hi b[Yb'k]Y'XUg'K Y]bZYgh']b'9f[Ybn]b[Yb'cXYf'XUg
A chcffUXhfYZZYb'XYg'A 7'%-,,'<UfXh'j YfXYi h`]WXYb'XUg
Ni gUa a Ybgd]Y`nk]gWXYb'?i `hi f'i bX'K]fhgWXUZh'i bX'X]YbYb'U`g
6Y]gd]Y'Y'ZØf'XYb'YfZc`[fY]WXYb'5i ghUi gWX'i bX'X]Y'JYfbYhni b[
]bbYf\U`V'XYf'; Ya Y]bgWXUZh'i

8 YhU]`a

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z. 'X]Y!bUWX f]WX hYb "bYh