

## 9]b GhØW\_; YgWX]WX hY. ? Ui Za Ubbg 9fVY ]a ; Òf`]hnYf A i gYi a

9bhXYW\_Yb'G]Y'XYb'BUW\`Ugg'XYg'; Òf`]hnYf'\DXi ghf]Y``YbG]Y[Zf]YX'?Ui Za Ubb']a'; Òf`]hnYf'AigYi a'''Y]bY'; YgW\]W\hYjcb'\Dcb'ibX'GW\]W\_gU`"

8]Y '6ØghY'j cb'G]Y[Zf]YX'? Ui Za Ubbž'X]Y']a '<YfnYb'XYf'GhUXh dfÀgYbh]Yfh'k]fXž']gh'b]W\h'bi f'Y]b'?i bghk Yf\_ž'gcbXYfb'Ui W\'Y]b gma Vc`]gW\Yg'NYi [b]g'ZØf'Y]bY'ŸfU'XYg']bXi ghf]Y``Yb'K UbXY`g" 8]Y'\dangle Xi ghf]U`]gYfi b['5bZUb['XYg'\&\"\dangle X'\f\i bXYfhg'VfUW\hY'b]W\h bi f'bYi Y'HYW\bc`c[]Ybž'gcbXYfb'Ui W\': cfhgW\f]hh'i bX'K c\`ghUbX ZØf'j]Y`Y': Ua]`]Yb']b'XYf'FY[]cb''Ni j cf'k Uf'? Ui Za Ubb']b'X]Y GhUXh'[Y\_ca a Ybž'i a 'X]Y'Ni W\h\Ui gk YVYfY]'ni 'ØVYfbY\a Yb i bX'k Yb]['gd\h'Yf'X]Y']bgc`j YbhY'K YVYfY]'i bX': \h'VfY]'K U``UW\'/ < Yfhn'ni 'fYhhYb''8]Yg'ZØ\fhY'ni f'; fØbXi b['XYf':]fa U' A Ø``Yf'/? Ui Za Ubb ž'X]Y'ni f'[f\overline{O}\hat{V}\text{b}\text{i} bZ'\text{b}\text{i} bZ'\text{b}\text{i} bZ'\text{j}\text{i} bZ'\text{j}\text{i} bZ'\text{j}\text{j}\text{i} bZ'\text{j}\text{j}\text{i} bZ'\text{j}\text{j

### 9]bY'[`Ubnj c``Y': ]fa Yb[YgWX]WXhY

8]Y ii bhYf'? Ui Za Ubbg': Ø\fi b[ '[ YhÀh][ hYb' $\pm$ bj Ygh]h]cbYb'i bX ghfUhY[ ]gW\Yb'9bhgW\Y]Xi b[ Yb'Yfa  $\dot{O}$ [ `]W\hYb'Y]b'gW\bY``Yg

K UWX ghi a "'6YfY]hg'j cf'XYa '9fghYb'K Y`h\_f]Y['VYgWXÀZh][hY'XUg I bhYfbY\a Yb'fi bX'+\$\$'A]hUfVY]hYf"'8 Ug'I bhYfbY\a Yb [YbYf]YfhY'5fVY]hgd`ÀhnY'i bX'k Uf'Y]b'nYbhfU`Yf'6YghUbXhY]`'XYf k]fhgWXUZh`]WXYb'Ghfi \_hi f'XYf'GhUXh"'8]Y'? Ui Za UbbgWXY'J]``Už'Y]b kY]hYfYg'9fVY'gY]bYf': Ua]`]Yž'ghY\h'V]g'\Yi hY'U`g'bUWX'k]Y'j cf Y]bXfi W\_gj c``Yg'NYi [b]g'XYf'? Ui Za Ubbg"'9g']gh'Y]b'Cfhž'Ub'XYa X]Y'; YgWX]WXhY'XYf': Ua]`]Y'i bX']\fYg'[YgWXÀZh`]WXYb'9fZc`[g

 $= \frac{1}{2} \left( \frac{1}{2} \right) \left($ 

### 8 Yf'K UbXY`i bX'XYf'J Yf`i gh'XYf': Ua ]`]Y ? Ui Za Ubb

8]Y 'hi fVi `YbhY 'NY]h'nk ]gWX Yb 'XYb 'K Y`h\_f]Y[ Yb 'VfUWX hY 'ZØf'j ]Y`Y I bhYfbY\a Yb 'XYf'HYI h]`]bXi ghf]Y 'Yf\YV`]WX Y 'DfcV`Ya Y 'a ]h'g]WX "GWX cb ']b 'XYf'K Y]a UfYf'F Ydi V`]\_'\_Aa dZhY 'X]Y '6fUbWX Y '[ Y[ Yb F ØW\_[ Àb[ Y"'B UWX 'XYf'A UWX hYf[ fY]Zi b[ 'XYf'B Uh]cbU`gcn]U`]ghYb %- ' ' 'j YfgWX `YWX hYfhY 'g]WX 'X]Y '@U[ Y 'k Y]hYfž'k Ug`gWX `]Y » `]WX 'XUni ZØ\fhYž'XUgg'X]Y '? Ui Za Ubb!: Ua ]`]Y '8 Yi hgWX `UbX'j Yf`UggYb a i gghY"'%- ' , 'k i WXg'X]Y B chk YbX][ \_Y]h'ni \UbXY`bž'i bX 'X]Y [ YgUa hY ': Ua ]`]Y 'gU\'g]WX '[ Ynk i b[ Ybž'XUg`@UbX'ni 'j Yf`UggYbž i a 'XYf'J YfZc`[ i b[ 'ni 'Ybh[ Y\Yb"'8]Y ': ]fa U'ZUbX'\_Y]bY 'Uf]gWX Yb B UWX Zc`[ Yfž'k Ug'Y]b'k Y]hYfYg'? Ud]hY`']b 'XYf'; YgWX]WX hY 'XYf HYI h]`]bXi ghf]Y ']b'; Òf`]hn'i bX'XYf'GhUXh'gY`Vgh'XUfghY``h"

8]Y'FØW\_\_Y\f'XYg'BUW\`UggYg']b'X]Y'GhUXhž'Y]bgW\`]Y»`]W\'XYf I fYb\_Y`hcW\hYf'D\]`]ddU'&\b!7cc\_ž'X]Y'nU\`fY]W\Y 9f]bbYfi b[ gghØW\_Y'i bX': chcg'ØVYf[ UVž'ghY``h'Y]bYb'VYXYi hYbXYb GW\f]hh'XUfž'i a '?Ui Za Ubbg'9fVY'k]YXYf']bg'6Yk i gghgY]b'XYf 2 ZZYbh`]W\\_Y]h'ni 'Vf]b[Yb"'8Yf'JYf`i gh'XYf'?Ui Za Ubb!8mbUgh]Y 8]Y'FØW\_\_Y\f'XYf'6ØghY']gh'Y]b'NY]W\Yb'XYg'6YkigghgY]bg'ZØf'X]Y
J Yf[ Ub[ Yb\Y]h'i bX'XYf'5bYf\_Ybbi b[ 'XYf'6Y]hfÀ[ Yž'X]Y''ØX]gW\Y
I bhYfbY\a Yf'k]Y'G]Y[ Zf]YX'? Ui Za Ubb'ni 'Y]bYf'V'Ø\YbXYbž
]bXi ghf]Y``Yb'; YgY``gW\UZh'[ Y`Y]ghYh'\UVYb"'8]YgY'FØW\_V`]W\_Y
\Y`ZYb'i bgž'gck c\``X]Y'dcg]h]j Yb'U`g'Ui W\`X]Y'Xi b\_`Yb'? Ud]hY``XYf
; YgW\]W\hY'ni 'j YfghY\Yb'i bX'ni 'k ØfX][ Ybž'i bX'g]Y'\U`hYb'XUg
5bXYb\_Yb'Ub'VYa Yf\_Ybgk YfhY'DYfgÒb`]W\\_Y]hYb'i bX']\fY
@Y]ghi b[ Yb'`YVYbX][ "

### FYZ`YI]cb'ØVYf'X]Y'JYf[Ub[Yb\Y]h

8]Y '9bhgW\`cggYb\Y]h'XYf' < Ö\`YbZUa]`]YžXUg'JYfa ÀW\hb]g'j cb G]Y[Zf]YX'? Ui Za Ubb'Ua '@YVYb'ni '\U`hYbž'nY][h'i bgž'k]Y'k]W\h][Yg']ghž'X]Y'; YgW\]W\hY'ni 'VYk U\fYb"'5i W\'k Ybb'j]Y`Y'gW\k]Yf][Y?Ud]hY``YfnÀ\`h'k YfXYb'a ØggYbž'V`Y]VYb'X]Y'9fZc`[Y'i bX'XYf: cfhgW\f]hhž'XYb'I bhYfbY\a Yb'k]Y' A Ø``Yf'/'? Ui Za Ubb XUf[YghY``h'\UVYbž'k]W\h][Y'H\Ya Yb'ZØf'\_ØbZh][Y'; YbYfUh]cbYb" 8]Y'5i gghY``i b[']a'; Òf`]hnYf'A i gYi a']gh'b]W\h'bi f'Y]bY < ca a U[Y'Ub'Y]b'VYa Yf\_Ybgk YfhYg'@YVYbž'gcbXYfb'Ui W\'Y]bY 9f]bbYfi b['XUfUbž'k]Y'k]f'X]Y'@Y\fYb'Ui g'XYf'JYf[Ub[Yb\Y]h'ZØf X]Y'Ni\_i bZh'bi hnYb'\_ÒbbYb"

# 8 Y f '9]b Z`i gg'j cb 'G]Y [ Zf]Y X '? Ui Za Ubb 'Ui Z'X]Y ; Òf`]hn Y f 'K ]f hg W U Zh

G]Y[Zf]YX:?Ui Za Ubbik Ufib]Wkhibi fiY]biVYXYi hYbXYf
I bhYfbY\a YfžigcbXYfbiUi WkiY]bYiGWkiØggYiZ][i fi]biXYf
9bhk]W\_ii b[iXYfi; Òfi]hnYfiK]fhgWkUZhini igY]bYfiNY]hii8]Y
; fØbXi b[iXYfi:]fa Ui A ØiYfi/i?Ui Za Ubbija iyJ\fi%, +' iZ]Yii]b
Y]bYiD\UgYiXYfi]bXi ghf]YiiYbi9I dUbg]cbi]bi8Yi hgWkiUbXži]biXYfiX]Y
HYI h]i]bXi ghf]YiZcf]YfhYii; Òfi]hnik UfighfUhY[]gWki[Øbgh][i[YiY[YbibXidfcZ]h]YfhYij cbiXYfiBÀ\Yini ik]Wkh][YbiJYf\_Y\fgkY[Ybi

K À\fYbX'gY]bYf'; YgW\ÀZhgZØ\fi b[ 'Yf'YVhY'XUg'I bhYfbY\a Yb'Y]bfUgUbhYg'K UW\ghi a "'?Ui Za Ubb']a d`Ya Ybh]YfhY'a cXYfbYDfcXi \_h]cbga Yh\cXYb'i bX'gcf[ hY'ZØf'Y]bY'dfcZYgg]cbY``Y5i gV]`Xi b[ 'gY]bYf'A ]hUfVY]hYf"'8]Yg'ZØ\fhY'b]W\h'bi f'ni 'Y]bYfGhY][ Yfi b[ 'XYf'DfcXi \_h]cbg\_UdUn]hÀhYbž'gcbXYfb'Ui W\ni 'Y]bYfJYfVYggYfi b[ 'XYf'5fVY]hgVYX]b[ i b[ Yb"'Ni XYa 'VYhY]`][ hY'g]W\?Ui Za Ubb'Ub'`c\_U`Yb'<UbXY`g!'i bX'\DXi ghf]Yj YfVÀbXYbž'k UggY]bY'9]bZi ggbU\a Y'Ui Z'X]Y'fY[ ]cbU`Y'K ]fhgW\UZh'k Y]hYfjYfghÀf\_hY"

#### $8]YFc^Y^XX]gWXYf'IbhYfbY^aYf']bXYfFY[]cb$

## 5 i ZUfVY]hi b[ 'XYf'; YgWX]WX hY 'XYf'? Ui Za Ubb! : Ua ]`]Y

8]Y'FØW\_\_Y\f'XYg'BUW\`UggYg']b'X]Y'GhUXh'; Òf`]hn']gh'HY]`'Y]bYg
i a ZUggYbXYfYb'DfcnYggYg'XYf'5i ZUfVY]hi b['XYf'ØX]gW\Yb
; YgW\]W\hY']b'8Yi hgW\`UbX"'\#b'j]Y`Yb'Gh\XhYb'k YfXYb
VYXYi hYbXY'\]ghcf]gW\Y': ][i fYb'i bX'XYfYb'9]bZi gg'Ui Z'X]Y'`c\_U`Y

?i`hifibX`K]fhgW\UZh`k]YXYfYbhXYW\_h"`8Ug`; Òf`]hnYf`AigYiagd]Y`h`\]YfVY]`Y]bY`nYbhfU`Y`Fc``Yž`]bXYa 'Yg`b]W\h'bif`\]ghcf]gW\YCV'Y\_hY`UigghY``hžgcbXYfb`UiW\`Y]bY`D`UhhZcfa 'ZØf`8]g\_igg]cbYbØVYf`XUg`9fVY`'ØX]gW\Yf`:Ua]`]Yb`]b`8YihgW\`UbX`V]YhYh"

8]Y'FØW\_\_Y\f'ZUa]`]ÀfYf'5fhYZU\_hYž'k]Y'X]Y'6ØghY'j cb'G]Y[Zf]YX?Ui Za Ubbž'nY][h'b]W\h'bi f'FYgdY\_hgVYnYi [i b[ž'gcbXYfb'Ui W\Y]b'\_c``Y\_h]j Yg'6Ya Ø\Yb'i a 'JYfgÒ\bi b['i bX'9f]bbYfi b["'8]Y</frac{YfUi gZcfXYfi b[Ybž'X]Y'a]h'X]YgYf'5i ZUfVY]hi b['j YfVi bXYb'g]bXžYfZcfXYfb'Y]bY'gYbg]V`Yb'I a [Ub['a]h'XYf'; YgW\]W\hY'i bX'Y]bY 5bYf\_Ybbi b['XYf'j]Y`ZÀ`h][Yb'DYfgdY\_h]j Ybž'X]Y']bbYf\U`V'XYf\]ghcf]gW\Yb'BUffUh]j Y'VYghY\Yb"

### 5\_hi Y``Y`6]`Xi b[g! i bX'; YXYb\_]b]h]Uh]j Yb

±0; Of`]hn'i bX'j ]Y`Yb'UbXYfYb'GhÀXhYb']b'8Yi hgWX`UbX'g]bX
±0]h]Uh]j Yb'YbhghUbXYbž'X]Y'g]WX'XYf'5i Z\_`Àfi b['ØVYf'X]Y
; YgWX]WX hY'ØX]gWXYf'; Ya Y]bgWXUZhYb'k]Xa Yb"
6]`Xi b[gdfc[fUa a Yž'5i gghY``i b[Yb'i bX'; YXYb\_j YfUbghU`hi b[Yb gc``Yb'XUg'6Yk i gghgY]b'ZØf'X]Y'; YgWX]WX hY'i bX'XUg'9fVY'
ØX]gWXYf': Ua ]`]Yb'ZÒfXYfb"'JcfhfÀ[Y'Ub'GWXi `Ybž'K cf\_g\cdg'i bX: Ø\fi b[Yb'Xi fWX'Y\Ya U`][Y'ØX]gWXY'GhUXhhY]`Y'g]bX'bi f'Y]b][Y
XYf'A U» bU\a Ybž'X]Y'Yf[f]ZZYb'k YfXYbž'i a 'XUg'K ]ggYb'ØVYf'X]Y
J Yf[Ub[Yb\Y]h'ni 'j Yfh]YZYb'i bX'Y]b'fYgdY\_hj c``Yg'A]hY]bUbXYf'ni ZÒfXYfb"

 $Gc`WXY` \pm 0]h]Uh]j Yb`g]bX`k ]WXh][ \check{z}i a `XUg`; YXÅWX hb]g`Ub`X]Y hfU[ ]gWXYb`9fY][ b]ggY`XYf`J Yf[ Ub[ Yb\Y]h`k UWXni \U`hYb`i bX [ `Y]WXnY]h][ `X]Y`dcg]h]j Yb`6Y]hfÂ[ Yž`X]Y`^ØX]gWXY`I bhYfbY\a Yf`k ]Y G]Y[ Zf]YX`? Ui Za Ubb`ni f`XYi hgWXYb`K ]fhgWXUZh`[ Y`Y]ghYh`\UVYbž`ni k ØfX][ Yb"$ 

## 6 Ygi WX Yb 'G]Y 'i bg 'Ui Z. 'b!U[ "XY