

## 8 fUa U`Ui Z`XYa `6cXYbgYY. `A chc fVcch VfYbbhž`7fYk `[ YfYhhYh

6fUbX`Ui Z`A chc fVcch`ja ` , VYf`b[ Yf`GYY. `ϕgUggYb `[ YfYhhYhž  
: Yi Yfk Y`f`ja `9]bgUhn"9fa ]hhi b[ Yb`ni f`6fUbXi fgUWXY  
`Ui ZYb"

ϕ`XYb`gd`ÄhYb`5VYbXghi bXYb`XYg`&("5i [ i gh&\$&(`\_Ua `Yg`ni  
Y]bYa `XfUa Uh]gWXYb`JcfZU`Ui Z`XYa ` , VYf`b[ Yf`GYY`b`I `X]b[ Yb!  
A Ø`\\cZYb"9]b`A chc fVcch`VfUW`]b: `Ua a Yb`Ui gž`k Ä`fYbX`g]W  
UW`h`ϕgUggYb` `ZØbZ`9fk UW`gYbY`i bX`XfY]?]bXYf` `Ub`6cfX  
VYZUbXYb"8]Y`G]hi Uh]cb`Yg\_U`]YfhY`gW`bY`ž`k Ug`ni `Y]bYa  
VYgcf[ b]gYffY[ YbXYb`BchZU`ZØ`fhY"

8]Y`6cchgVYgUhni b[ `UbXY`hY`Z`fW`h`cg`i bX`gW`bU`hY`g]W  
FYhhi b[ gk YghYb`i a žVYj cf`g]Y`]b`XYb`6cXYbgYY`gdfUb[ Yb"8cW  
g]Y`k UfYb`b]W`h`U`Y]b"9]b`Ui Za Yf\_gUa Yf`A chc fVcchZU`fYf  
VYa Yf`hY`X]Y`Bch`U[ Y`i bX`U`Ufa ]YfhY`i a [ Y`YbX`X]Y  
K UggYfgW`i hndc`nY]" ; Ya Y]bgUa `[ Y`Ub[ `Yg`]\bYbž`X]Y  
gW`i hn`cgYb`DUggU[ ]YfY`Ui g`XYa ` \_Ø`Yb`K UggYf`ni `fYhhYb`i bX  
g]W`Yf`]b`XYb`< UZYb`j cb`i bhYfi `X]b[ Yb`ni `j YfVf]b[ Yb"

## 9]bgUhn\_fÄZhY`j cf`C fh

B UW`XYa `X]Y` ϕgUggYb`XYg`A chc fVcchg`]b`G]W`Yf`Y]h`k UfYbž  
k ]Xa YhYb`g]W`X]Y`9]bgUhn\_fÄZhY`XYf`6Y\_Äa dZ b[ `XYg` : Yi Yfg"  
8]Y` : Yi Yfk Y`f`\_Äa dZhY` [ Y[ Yb`X]Y` : `Ua a Ybž`X]Y`XUg`6cch  
VYfY]hg`]b`Y]bYb`Jc`VfUbX`j Yfk UbXY`h`UhhYb"9g`XUi YfhY`b]W`h  
`Ub[ Yž`V]g`X]Y`@U[ Y`i bhYf`?cbhfc`Y` [ YVfUW`h`k YfXYb`\_ccb`hY/  
XYbbcW`k i fXY`XYf`a UhYf]Y`Y`GW`UXYb`Ui Z`Yhk U`&\$`\$`\$`\$`9i fc  
[ YgW`Ä`h`h"

⊕g[ YgUa h'k UfYb 'Yhk U'%'\$'9]bgUhn\_ fÄZhY 'j cb 'j YfgW\YXYbYb  
F Yhi b[ gcf[ Ub]gUh]cbYb 'i bX 'XYf 'Dc` ]nY] ' ]b 'X]YgYb '9fY][ b]ggYb  
]bj c`j ]Yfh" '8 ]Y '8 Yi hgW\Y '@YVYbg! F Yhi b[ g!; YgY`gW\UZh'fB @F ; Ł  
i bX 'XUg '8 Yi hgW\Y 'F chY ' ? fYi n'fB F ? Ł`Y]ghYhYb 'j cf 'C fh  
l bhYfghØhni b[ " '8 ]Y 'gW\ bY`Y 'F YU\_h]cb 'XYf 'F Yhi b[ ghYUa g'k Uf  
YbhgW\Y]XYbXž'i a 'X]Y '⊕gUggYb 'bUW\ 'X]YgYf 'YfgW\ fYW\_YbXYb  
9fZU\fi b[ 'Ub[ Ya YggYb 'ni 'j Yfgcf[ Yb"

## HYW\ b]gW\ Yf '8 YZY \_h'U`g'a Ø[ `]W\ Y 'i fgUW\ Y

8 ]Y 'YfghYb 'i bhYfgi W\i b[ Yb 'XYi hYb 'XUfUi Z`\ ]bž'XUgg 'Y]b  
hYW\ b]gW\ Yf '8 YZY \_h'Ua 'A chc fVcch'a Ø[ `]W\ Yfk Y]gY 'XYb '6fUbX  
Ui g[ Y`Øgh` \UVYb '\_ØbbhY" '8 ]Y 'K UggYfgW\i hndc` ]nY] ` \Uh'VYfY]hg  
9fa ]hhi b[ Yb 'Ui Z[ Ybca a Ybž'i a 'X]Y [ YbUi Y 'i fgUW\Y 'ni '\_`ÄfYb"  
⊕ '5bVYhfUW\h'XYf 'GYbg]V]`hÄh'X]YgYf 'G]hi Uh]cb `]gh'Yg'k ]W\h][ ž  
gc`W\Y 'hYW\ b]gW\ Yb 'A Äb[ Y`ni ' ]XYbh]Z]n]YfYb 'i bX 'ni 'UXfYgg]YfYbž  
i a 'ni \_ØbZh][ Y 'J cfZÄ`Y 'ni 'j Yfa Y]XYb"

8 ]Y 'fUgW\Y 'F YU\_h]cb 'XYf 'K UggYfgW\i hndc` ]nY] 'i bX 'XYf 'UbXYfYb  
F Yhi b[ gX]YbghY ` \Uh]b 'X]YgYf '\_f]h]gW\Yb '@U[ Y ` \ØW\ ghY 'G]W\Yf\Y]h  
[ Y[ YVYb" ; `ØW\_` ]W\Yfk Y]gY 'j Yf` ]YZ'XYf 'F Yhi b[ gY]bgUhn  
YfZc` [ fY]W\ž'i bX 'U`Y '⊕gUggYb 'g]bX 'k c\`Ui Z' '8 Yf 'J cfZU`  
i bhYfghfY]W\h'X]Y '6YXYi hi b[ 'j cb 'G]W\Yf\Y]hgj cf\_Y\fi b[ Yb 'ja  
K UggYfgdcfhž'k ]Y 'XUg 'HfU[ Yb 'j cb 'GW\k ]a a k YghYb 'i bX 'X]Y  
fY[ Y'a Ä»][ Y 'K Ufhi b[ 'j cb '6cchYb"

8 Yf '6fUbX 'Y]bYg 'A chc fVcchYg 'Ui Z'XYa ' , VYf` ]b[ Yf 'GY`Y ` \Uh'b]W\h  
bi f': fU[ Yb 'ni f'G]W\Yf\Y]h]b 'XYf': fY]nY]h[ YghU`hi b[ 'Ui Z[ Yk cfZYbž  
gcbXYfb 'Ui W\ 'Y]bY 'VfY]hY '8 ]g\_i gg]cb 'ØVYf 'X]Y 'K ]W\h][ \_Y]hj cb  
G]W\Yf\Y]hga U» bU\ a Yb 'VY] '6cchgUi gZØ[ Yb 'Ub[ Yghc» Yb" 'J cf  
U`Ya ' ]b 'XYb 'Gca a Yfa cbUhYbž'k Ybb 'j ]Y 'Y 'A YbgW\Yb 'X]Y  
; Yk ÄggYf [ Yb]Y» Yb 'a ØW\hYbž'g]bX 'gc`W\Y '9fY][ b]ggY 'k UfbYbXY  
6Y]gd]Y 'Y 'XUZØfž'k ]Y 'gW\ bY`Y ]b 'YbhgdUbbhYf 'HU[ 'Ui Z'XYa 'K UggYf  
[ YZÄ\ f` ]W\ 'k YfXYb '\_Ubb"

## K Yhh`Ui Z'[ Y[ Yb 'X]Y 'NY]h

⊕ 'XYf 'K Y`h'XYg 'K UggYfgdcfhg ]gh'gW\ bY`Yg ' < UbXYb 'c Zh'XYf

GW`ØggY`ni f`F Yhi b[ ``8Yf` : U\_hcf`NY]h`\_Ubb`]b`\_f]h]gWXYb  
A ca YbhYb`ØVYf`@YVYb`i bX`HcX`YbhgWXY]XYb``8]Y`9fY][ b]ggY`Ua  
, VYf`]b[ Yf`GYY`nY][ Yb`Y]bXfi W\_gj c`ž`k ]Y`k ]W h][ `Yg`]ghž`g]W`]b  
Bch`U[ Yb`VYgcb`bYb`ni `j Yf`U`hYb`i bX`X]Y`f]W h][ Yb`A U» bU`a Yb  
gW`bY`ni `Yf[ fY]ZYb``8]Y`hfU[ ]gWXY`A Ò[ `]W`\_Y]h`Y]bYg`6fUbXg`k ]fX  
Xi fW`XUg`K ]ggYb`XYf`6cc`hgZØ`fYf`ØVYf`hYW`b]gWXY`A Àb[ Y`i bX  
G]WXYf`Y]hgd`fch`c`Y`[ Ya `]`XYfh`

I a gc`k ]W h][ Yf`]gh`Ygž`XUgg`X]Y`² ZZ`b`h`]W`\_Y]h`ØVYf`gc`WXY  
J cfZ`À`Y`]bZ`cfa ]Yfh`V`Y]Vhž`i a `XUg`6Yk`i gghgY]b`ZØf`G]WXYf`Y]h`Ui Z  
XYa `K UggYf`ni `gW`ÀfZYb``K À`fYbX`g]W`X]Y`9fa ]hhi b[ Yb`ni f  
6fUbXi fgUWXY`ZcfhgYhnYbž`V`Y]Vh`ZYghni `U`hYbž`XUgg`X]Y  
?ca V]bUh]cb`Ui g`hYW`b]gWXYf`J cfVYfY]hi b[ `i bX`gW`bY`Ya  
<UbXY`b`XYf`9]bgUm\_f`ÀZhY`YbhgWXY]XYbX`k Ufž`i a `XUg  
GW`]a a ghY`ni `j Yf`]bXYfb`

## K ]W h][ Y`< ]bhYf[ fi bX]bZcfa Uh]cbYb

8Yf`J cfZU`Ui ZXYa ` , VYf`]b[ Yf`GYY`k ]fZi: fU[ Yb`ni f`G]WXYf`Y]h  
Ui ZXYa `K UggYf`Ui Zž`]bgVYgcbXYfY`]b`6Yni [ `Ui ZX]Y`5i gfØghi b[  
i bX`J cfVYfY]hi b[ `j cb` : fY]nY]hVcchYb`` ð`8Yi hgW`UbX`]gh`XYf  
6Yhf]YV`j cb`GdcfhVcchYb`i bX`A chc`fVcchYb`Xi fW`nU`fY]WXY  
J cfgW`f]ZhYb`[ YfY[ Y`hž`XUfi bhYf`X]Y`DZ]W`h`ni f`A ]hZØ`fi b[ `j cb  
F Yhi b[ gk YghYb`i bX`X]Y`8i fW`ZØ`fi b[ `fY[ Y`a `À» ][ Yf  
G]WXYf`Y]hgØVYfd`fØZ` b[ Yb``8]YgY`A U» bU`a Yb`X]YbYb`b]W`h`bi f  
XYa `Y][ YbYb`GW`i hn`XYf`6cc`hgZØ`fYf`i bX`DUggU[ ]YfYž`gcbXYfb  
gc`Yb`Ui W`Y]bYb`a Ø`Y`cgYb`9]bgUm`j cb`F Yhi b[ g\_f`ÀZhYb`]a  
BchZU`[ Yk `À`f`Y]ghYb`

8]Y`ghY][ YbXY`NU`U`Ub`K UggYfgdc`fhU`\_h]j ]h`hYbž`]bgVYgcbXYfY`]a  
Gca a Yfž`U`h`XUg`6Yk`i gghgY]b`ZØf`G]WXYf`Y]hgj cf`\_Y`fi b[ Yb  
Yf`À`h`@Ui h`XYf`8Yi hgW`Yb` ; YgY`gW`UZh`ZØf`F Yhi b[ gX]Ybgh  
fBF ; Łg]bX`k `À`fYbX`XYf`6UXY!`i bX`6cc`hgU]gcb`j Yfa Y`fh  
F Yhi b[ gU`\_h]cbYb`bØh][ ž`k cVY]`hYW`b]gWXY`8YZ`\_hY`Ài Z][ `U`g  
I fgUWXY`ZØf`i bZ`À`Y`Ui ZXYa `K UggYf`]XYbh]Z]n]Yfh`k YfXYb`` ð  
8Yi hgW`UbX`[ ]Vh`Yg`š`À`f`ZØf`š`À`f`Y]bY`J ]Y`nU`j cb`BchZ`À`Ybž`X]Y  
Xi fW`i b[ YbØ[ YbXY`G]WXYf`Y]hgj cf`\_Y`fi b[ Yb`cXYf`hYW`b]gWXYg  
J YfgU[ Yb`VY[ fØbXYh`g]bX`

## 5\_hi Y`Y`GhUh]gh]\_Yb`i bX`8 UhYb

8]Y`ghUh]gh]gWYb`8 UhYb`ØVYf`I bZ`Y`ja`K UggYfgdcfhVY`Y[ Yb`X]Y  
F`Y`Yj Ubn`XYg`H\Ya Ug`G]WYf\Y]h`Ui Z`XYa`K UggYf`"&\$&&  
fY[ ]ghf]YfhY`X]Y`K UggYfgW`i hndc`nY]]b`8Yi hgW`UbX`]bg[ YgUa`h  
(%)`I bZ`Y`a`]hGdcfhVcchYb`žk Ug`Y]bYa`5bgh]Y[ ]cb`)`i`ja  
JYf[ `Y]W`ni a`Jcf`U\`f`Ybhgd]W`h`"bgVYgcbXYfY`hYW`b]gWY  
8YZ`\_hY`k UfYb`]b`Yhk`U`\$`i`X]YgYf`:"`Y`Ui ggW`U[ [ YVYbX"  
8UfØVYf`\]bUi`g`nY][ Yb`I a`ZfU[ Yb`ž`XUgg`bi`f`Yhk`U`\*`\$`i`X`Yf  
6cchY][ bYf`fY[ Y`a`À»][ `G]WYf\Y]hg]bgdY`\_h]cbYb`]`fYg`6cchYg  
Xi`fW`ZØ`fYb`"

8]Y`5bnU`\`XYf`F`Yhi`b[ gY]bg`ÀhnY`Xi`fW`8`@F;`i`bX`8`F?`]gh]b`XYb  
Gca`a`Yfa`cbUhYb`hfUX]h]cbY``\`cW`"6Y]gd]Y`gk`Y]gY`ZØ`fhY`X]Y  
8`@F;`]a`"U\`f`&\$&%`a`Y\`f`U`g`&"\$`\$`\$`9]bg`ÀhnY`Xi`fW`ž`k`cVY]j`]Y`Y  
XUj`cb`Ui`Z`hYW`b]gWY`DUbbYb`i`bX`a`YX]n]b]gWY`B`chZ`Y`Y  
ni`fØW`\_ni`ZØ`fYb`k`UfYb`"8]YgY`8`UhYb`j`YfXYi`h`]WYb`X]Y  
B`chk`YbX][`\_Y]h]j`cb`d`f`Àj`Yb]j`Yb`A`U»`bU`a`Yb`i`bX`VYggYfYf  
5i`Z`\_`Àfi`b[ `ØVYf`G]WYf\Y]h]a`K UggYfgdcfhi`a`ZY`X`"

8]Y`6YXYi`hi`b[ ]cb`5i`gV]`Xi`b[ Yb`k`]Y`XYa  
GdcfhVcchZØ`fYfgWY]b`cXYf`gdYn]Y`Y`Yb`G]WYf\Y]hg`\_i`fgYb`k`]fX`]b  
X]YgYa`Ni`gUa`a`Yb`Ub[ `c`Zi`VYhcbh`"8]Y`fY[ Y`a`À»][ Y`GW`i`i`b[  
i`bX`K`Y]hYfV]`Xi`b[ ]a`I`a`[ Ub[ `a`]h`B`chZ`Y`Yb`\_Ub`b`Yb`hgWY]XYbX  
XU`ni`VY]hfU[ Yb`ž`gc`WY`I`bZ`Y`ni`j`Yfa`Y]XYb`i`bX`X]Y`G]WYf\Y]h  
Ui`Z`XYa`K UggYf`Yf\`YV`]W`ni`Yf\`Ø`Yb`"

8YhU]`g

6Ygi`W`Yb`G]Y`i`bg`Ui`Z.`b!U[ "XY