

; UVf]Y`A cgWUfXc`Ui Z`@Y]\VUg]g.  
HU`Yb hgW\ a ]YXY`XYg`DG; `]b`F Y]a g

; UVf]Y`A cgWUfXc`k ]fX`ZØf`X]Y`GU]gcb`&\$&(!&\$&) `j ca`DG;  
Ub`XYb`GhUXY`XY`FY]a g`j Yf`]Y\Ybž`i a`g]W\ `]b`XYf`@[ i Y`%`ni  
Ybhk ]W\_Y`b"

⇒ a bYi Yb : i » VU``U\ f &\$&(!&\$&) [ ]Vh Yg ZØf XYb DG; !  
B UW\ k i W\ggd]Y`Yf ; UVf]Y` A cgWUfXc Y]bY gdUbbYbXY K YbXi b[ "  
GhUhh X]fY\_h ZØf XYb DUf]g GU]bh!; Yfa U]bž Y]bYb XYf [ fØ» hYb i bX  
VY\_UbbhYghYb : i » VU``j YfY]bY 9i fcdUgž ni gd]Y`Ybž k ]fX XYf Yfgh  
%, !Ä\ f][ Y 6fUg]`]UbYf ni bÄW\gh ]b XYf @[ i Y % ZØf XYb GhUXY XY  
FY]a g Ui ZXYa D`Uhn ghY\Yb" 8]Yg k ]fX Yg ]\a Yfa Ø[ `]W\Ybž g]W\  
Ub X]Y ; Y[ YVYb\Y]hYb ]b : fUb\_fY]W\ Ubni dUggYb i bX YfghY  
9fZ\fi b[ ]Yb`Ui ZYi fcdÄ]gW\Ya `6cXYb`ni `gUa a Y`b"

8]Y J YfUbhk cfh]W\Yb XYg DG; \UVYb g]W\ YbhgW\ ]YXYbž A cgWUfXc  
ZØf Y]bY GU]gcb Ub XYb GhUXY XY FY]a g ni j Yf`Y]\Yb" 8]Yg ]ghY]bY  
VYk i gghY A U» bU\ a Yž i a g]W\Yfni ghY`Ybž XUgg Yf [ YbØ[ YbX  
Gd]Y`nY]h Yf\Ä`h i bX g]W\ \_cbh]bi ]Yf`W\ k Y]hYfYbhk ]W\_Y`b \_Ubb"  
8Yf nYbhfU`Y A ]hhY`ZY`Xgd]Y`Yf k ]fX ]b X]YgYf GU]gcb i bhYf XYf  
5b`Y]hi b[ j cb HfU]bYf @ \_U 9`gbYf ghY\Ybž XYf Yfgh j cf \_i fnYa  
X]Y @[ i Y & a ]h XYa <Uj FY 57 [ Yk cbbYb \Uh" 5`g HY]` X]YgYg  
@Y]\ [ YgW\ÄZhg [ ]VhYg `YXcW\ \_Y]bY Cdh]cb ZØf Y]bYb ni \_ØbZh][ Yb  
?Ui Z`Xi fW\`XYb`FY]a g"

9]b`Zf]gW\ Yf`GhUfh`ZØf`; UVf]Y`A cgWUfXc

A CG75F8CG K Y[ ni a GhUXY XY FY]a g ]ghY]b GW\ f]hh ]b gY]bYa  
K YfXY[ Ub[ ž XYf ZØf j ]Y`Y ↑ b[ Y HU`YbhY ]b 9i fcdU hmd]gW\ ]gh" l a  
]b X]Y YfghY A UbbgW\UZh XYg DG; Y]b[ fY]ZYb ni \_ØbbYbž VYbØh][ h  
Yf k Yfhj c``Y 9]bgUhnY]hYbž X]Y ]\a ]b XYf ZfUbnØg]gW\Yb Hcd!@[ U

[ YVchYb k YfXYb" Gd]Y`Yb ]b Y]bYf A UbbgW\UZh k ]Y FY]a g V]YhYh  
]a X]Y dYfZY\_hY D`UhhZcfa ž i a XYb Gdfi b[ ]bg dfcZYgg]cbY`Y  
: i » VU``[ YgW\ÀZhini `gW\UZZYb"

8 Ug @Y]\[ YgW\ÀZh \Uh X]Y I bhYfghØhni b[ XYg DG; ž Y]bYf XYf  
[ fØ»hYb : i » VU``]bgh]hi h]cbYb 9i fcdUgž i bX k ]fX j cfUi gg]W\h]W\  
]a cdh]a U`Yb ðhYfYggY XYg Gd]Y`Yfg j Yf`Ui ZYb" A cgW\UfXc \UhX]Y  
A Ô[ `]W\\_Y]hž ]b Y]bYa k YhhVYk YfVg]bhYbg]j Yb I a ZY`X ni gd]Y`Yb  
i bX g]W\ Ub X]Y i b[ Yk Ò`b`]W\Yb ; Y[ YVYb\Y]hYb XYg  
ZfUbnØg]gW\Yb : i » VU``g`Ubni dUggYb"

## 8 ]Y `5i gk ]f\_i b[ Yb`i bX`J cfhY]`Y`XYf`@Y]\Y

@Y]\[ YgW\ÀZhY g]bX ]b XYf : i » VU``k Y`h [ Àb[ ][ Y DfUI ]g" G]Y  
Yfa Ô[ `]W\Yb Yg hU`Ybh]YfhYb Gd]Y`Yfbž 9fZU\fi b[ Yb ni gUa a Y`b  
i bX ]\fY : À\[ ]\_Y]hYb i bhYf fYU`Yb K Yhh\_Ua dZYVX]b[ i b[ Yb ni  
Ybtk ]W\_Y`b" : Øf A cgW\UfXc \_ÒbbhY XUg Y]bY \Yfj cffU[ YbXY  
; Y`Y[ Yb\Y]hgY]bž g]W\ U`g @Y]ghi b[ ghfÀ[ Yf ni YhUV`YfYb i bX X]Y  
J YfUbtk cfh]W\Yb XYg DG; ni ØVYfnYi [ Ybž XUgg Yf XUg DchYbn]U`  
\Uhž]b`X]Y`YfghYb`A UbbgW\UZh`XYg?`i Vg`]bhY[ f]Yfh`ni `k YfXYb"

8 ]Y FY]a gYf : Ubg \_ÒbbYb g]W\ j ]Y`Y]W\h gW\cb Ui Z Y]b][ Y  
VYY]bXfi W\_YbXY 5i Zh]hhY XYg hU`Ybh]YfhYb A ]hhY`ZY`Xgd]Y`Yfg  
ZfYi Yb" GY]bY hYW\b]gW\Yb : À\[ ]\_Y]hYb i bX gY]bY Gd]Y`]bhY``[ Ybn  
\_ÒbbhYb ]a \Y`ZYbž g]W\ gW\bY`` ]b XUg HYUa ni ]bhY[ f]YfYb i bX  
j cb : Ø\fi b[ gZ[ i fYb`]a `?UXYf`ni ``YfbYb"

≈ ?cbhYI h j cb DG; k ]fX cZh j ]Y` ØVYf X]Y GhUfg i bX [ fc»Yb  
BUa Yb [ YgdfcW\Yb" 8cW\ X]Y 9btk ]W\_`i b[ ↑ b[ Yf HU`YbhY k ]Y  
A cgW\UfXc ]ghYVYbgc k ]W\h][ i bX a i gg b]W\h]b XYb GW\UhhYb XYf  
YhUV`YfhYb Gd]Y`Yf ghY\Yb" 8 ]Y A Ô[ `]W\\_Y]hž i bhYf Y]bYa  
YfZU\YbYb HfU]bYf k ]Y @\_U 9`gbYf ni gd]Y`Ybž XYf VYfY]hg  
VYk ]YgYb \Uhž XUgg Yf ↑ b[ Y Gd]Y`Yf ZØfXYfb \_Ubbž k ]fX ZØf  
A cgW\UfXc`g]W\Yf`]W\ j cb`[ fc»Ya `J cfhY]`gY]b"

8 ]YgYf GW\f]hh \_ÒbbhY b]W\h bi f A cgW\UfXcg ?Uff]YfYž gcbXYfb  
Ui W\ X]Y D\]`cgcd\]Y j cb DG; ž HU`YbhY ni Ybtk ]W\_Y`b i bX ni  
ZØfXYfbž ØVYfXYb\_Yb `UggYb" ð Y]bYf NY]hž ]b XYf [ fc»Y 7`i Vg

\_cbghUbh bUWk XYb VYghYb j YfZØ[ VUFYb Gd]Y`Yfb gi WkYbž nY][ h  
DG; a ]h X]YgYf @Y]\Yž XUgg g]Y Ui Wk VYfY]h g]bXž Ui Z X]Y Y][ YbY  
đ [ YbX`ni `gYhnYb`i bX`XYfYb`9bhk ]W\_`i b[ `ni `i bhYfghØhnYb"

## Ni \_i bZhgj ]g]cb`i bX`9fk Ufhi b[ Yb

Ni gUa a YbZUggYbX `Àggh g]Wk gU[ Ybž XUgg X]Y 9bhgWkY]Xi b[ ž  
; UVf]Y` A cgWUfXc bUWk FY]a g ni j Yf`Y]\Ybžk Y]hUi g a Y`f ]gh U`g  
bi f Y]b Y]bZUWkYf HfUbgZYf" 9g ]gh Y]b ghfUhY[ ]gWkYf GWk f]hh ZØf  
VY]XYb GY]hYb" K Ybb A cgWUfXc X]Y 7\UbWk bi mh i bX ni  
ØVYfnYi [ Yb k Y]» ž \_ØbbhY X]Yg b]Wk h bi f gY]bYb Y][ YbYb  
K YfXY[ Ub[ j cfUbhfY]VYbž gcbXYfb Ui Wk DG; nY][ Ybž XUgg X]Y  
=j Ygh]h]cb ]b XYb BUWk ki Wk g g]Wk `Ub[ Zf]gh][ Ui gnU`h" 8]Y  
\_ca a YbXYb A cbUhY k YfXYb YbhgWkY]XYbX gY]bž i a ni gY\Ybž  
k ]Y g]Wk X]YgY Ui ZfY[ YbXY 9bhk ]W\_`i b[ YbhZU`hYh i bX k Y`WkY  
Fc`Y`A cgWUfXc `]b`XYf`ZfUbnØg]gWkYb`@[ i Y`%`gd]Y`Yb`k ]fX"

; UVf]Y`A cgWUfXcžXYf`%, !`À\ f][ Y`VfUg]`Ub]gWkY`A ]hY`ZY`Xgd]Y`Yfž  
\Uh]g]Wk `]b`XYb ``YmhYb`đ\ fYb`U`g`j ]Y`j YfgdfYWkYbXYg`HU`Ybh`ja  
: i » VU``Ybhk ]W\_Y`h``6Yj cf`Yf`ni a `DG; `\_Ua ž`gd]Y`hY`Yf`]b`XYf  
đ [ YbXa UbbgWk UZh]j cb`7cf]bh\]Ubgž`k c`Yf`gY]bY` : À\][ \_Y]hYb`i bX  
gY]b`DchYbn]U`i bhYf`6Yk Y]g`ghY`hY" 8]Y`9bhgWkY]Xi b[ `XYg`DG; ž  
]\b`ni `j YfdZ]Wk hYbž`nY][ h`XUg`j YfhfUi Yb`XYg`7`i Vg`]b`gY]bY  
HU`YbhY`i bX`X]Y`5i gg]Wk hž`XUgg`Yf`]b`bU\Yf`Ni \_i bZh]Y]bY`k ]Wk h][ Y  
Fc`Y`ja `ZfUbnØg]gWkYb` : i » VU``gd]Y`Yb`\_ØbbhY"

## @Y]\ [ YgWk ÀZh`i bX`9bhk ]W\_`i b[ `]a `GhUXY`XY`FY]a g

8Yf`K YWk gY`ni a `GhUXY`XY`FY]a g`]ghY]bY`\_`i [ Y`9bhgWkY]Xi b[  
ZØf`A cgWUfXc``FY]a g`\Uh]g]Wk `]b`XYb ``YmhYb`đ\ fYb`ni `Y]bYa `?`i V  
Ybhk ]W\_Y`hž`XYf`hU`Ybh]YfhYb`ŕ b[ Yb`Gd]Y`Yfb`X]Y`A Ò[ `]Wk\_Y]h[ ]Vhž  
]b`Y]bYf`k YhhVYk YfVgZÀ\][ Yb`@[ U`9fZU\fi b[ Yb`ni `gUa a Y`b"  
I bhYf`XYf`@Y]hi b[ `j cb`@ \_U`9`gbYfž`XYf`&\$&`X]Y`@[ i Y`&[ Yk Ubbž  
\Uh`XYf`7`i V`Y]bY`dcg]h]j Y`9bhk ]W\_`i b[ `Xi fWk`Ui ZYb``8]YgY  
Ni gUa a YbUfVY]h`V]YhYh`A cgWUfXc`X]Y`7\UbWk`ž]g]Wk  
k Y]hYfni Ybhk ]W\_Y`b`i bX`g]Wk`Ub`XUg`B]j YUi `XYf`@[ i Y`%  
Ubni dUggYb"

5i [ YbV`]W\_`]W`ghY\Yb`j ]Y`Y`' b[ Y`Gd]Y`Yf`j cf`XYf  
<YfUi gZcfXYfi b[ ž`g]W`b`Yi fcd`]gW`Yb`@[ Yb`ni`YhUV`]YfYb`", VYf  
@Y`\ [ YgW`ÀZhY`\_`ÒbbYb`g]Y`k`Yfhj`c`Y`Gd]Y`Z`À`\[\_Y]hYb`Yfk`YfVYb  
i bX`g]W`[ `Y]W`nY]h][ `Ub`XYb`@YVYbggh`i bX`X]Y`5bZcfXYfi b[ Yb`]b  
9i fcdU`[ Yk`Ò\`bYb`"A`cgWUfXcg`@Y`\Y`ni`FY]a`g`c`\bY`?Ui`Zcdh]cb  
nY][`h`XUg`J`YfhfUi`Yb`XYg`DG;`ž`XUgg`Yf`]b`XYf`Ni`\_i`bZh`Y]bY  
GW`ØggY`fc`Y`]a`HYUa`Y]bbY`a`Yb`\_`ÒbbhY"

5\_hi`Y`Y`G]hi`Uh]cb`]a`ZfUbn`Òg]gW`Yb`:`i`»`VU`

8]Y`@[`i`Y`%`nY]W`bYh`g]W`Xi`fW`Y]bY`ghY][`YbXY  
K`YhhVYk`YfVgZ`À`\[\_Y]h`Ui`gž`gck`c`\`Ui`Z[`fi`bX`XYf`HU`YbhZ`ÒfXYfi`b[  
U`g`Ui`W`Xi`fW`X]Y`j`cf`\UbXYbYb`Z]bUbn]Y`Yb`A`]hhY`j`]Y`Yf`7`i`Vg"  
8]Yg`]gh`VYgcbXYfg`fY`Yj`Ubhž`XU`ZfUbn`Òg]gW`Y`7`i`Vg`]b`XYb`Y`hnhYb  
`U\`fYb`Ui`W`Ui`Z`]bhYfbUh]cbU`Yb`6`Ø\`bYb`ž`k`]Y`XYf`I`9: 5  
7`Ua`d]cbg`@YU[`i`Yž`VYUW`h]W`Y`@Y]ghi`b[`Yb`[`YnY][`h`\UVYb`"`đ  
X]YgYf`GU]gcb`k`]fX`XUg`K`YhhVYk`YfVgi`a`ZY`X`Xi`fW  
J`Yf`\UbX`i`b[`Yb`ØVYf`J`Yfhf`À[`Y`i`bX`Gd]Y`Yfhf`UbgZYfg`[`Ydf`À[`hž  
k`cVY]`?m]Ub`A`VUdd`À`Y]bY`nYbhf`U`Y`F`c`Y`gd]Y`hž`XU`Yf`XYa`DG;  
)`A`j`]cbYb`9i`fc`Z`Øf`gY]bYb`J`YfV`Y]V`]a`J`YfY]b`j`cf[`Yk`cfZYb`\Uh  
fE`i`Y`Y.`dg[`"Zf`"

8]Y`9b`hk`]W\_`i`b[ `Y`' b[ Yf`HU`Yb`hY`]b`9i`fcd`U

8]Y`FY`Yj`Ubn`' b[ Yf`HU`Yb`hY`]a`Yi`fcd`]gW`Yb`:`i`»`VU`b]a`a`h  
gh`ÀbX][`ni`ž`XU`j`]Y`Y`J`YfY]bY`g]W`i`a`X]Y`J`YfdZ]W`hi`b[  
j`]Y`j`Yfgd`fYW`YbXYf`Gd]Y`Yf`VYa`Ø\`Yb`"GhUh]gh]\_Yb`nY][`Yb`ž`XUgg  
ni`bY`a`YbX`Øb[`YfY`Gd]Y`Yf`]b`@[`U!Hcd!`?`i`Vg`:`i`»`ZUggYb`"@Ui`h  
Y]bYf`5b`U`mgY`k`UfYb`]a`U\`f`&\$&`" ` \$i`XYf`Gd]Y`Yf`]b`XYf`@[`i`Y`%  
i`bhYf`&%`U\`fYb`ž`k`Ug`Ui`Z`Y]bY`GhfUhY[`]Y`\]bXYi`hYhž`X]Y`Ui`Z  
`Ub[`Zf]gh][`Y`9fZc`[`Y`gY`hnh`7`i`Vg`U[`]YfYb`ni`bY`a`YbX`dfc`U\_hj`VY]  
XYf`Y`Ybh]Z]n]Yfi`b[`i`bX`9b`hk`]W\_`i`b[`j`cb`HU`Yb`hYb`ž`k`Ug`XYb  
K`YhhVYk`YfVgXfi`W\_`Yf`\`Ò\`hi`bX`X]Y`@[`Yb`Ui`g[`Y[`]W`YbYf`a`UW`h"

8i`fW`X]Y`@Y`\Y`j`cb`A`cgWUfXc`k`]fX`b]W`h`bi`f`gY]b`]bX]j`]Xi`Y`Yg  
DchYbn]U`[`YZ`ÒfXYfhž`gcbXYfb`Ui`W`XYf`5bhY]`' b[ Yf`Gd]Y`Yf`]b`XYf  
\`ÒW`ghYb`ZfUbn`Òg]gW`Yb`@[`U`k`Y]hYf`Yf`\`Ò\`hž`k`Ug`Ui`Z`Y]b`dcg]hj`Yg  
NY]W`Yb`Z`Øf`X]Y`Ni`\_i`bZh`XYg`ZfUbn`Òg]gW`Yb`:`i`»`VU`g`\]bXYi`hY`h"

8YhU]g

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