

6]`Xi b[ ž`A ] [ fUh]cb`i bX` ; Ygi bX\Y]h.  
GW`b]YXYf`ZcfXYfh`J Yf`ÀbXYfi b[ `]b  
F \Y]b`UbX!DZU`n

; cfXcb`GW`b]YXYfž`78I !@UbXYgW`YŽ`gYhnh]a `K U\`\_Ua dZ  
Ui Z6]`Xi b[ ž`A ] [ fUh]cb`i bX` ; Ygi bX\Y]h]b`F \Y]b`UbX!DZU`n"

8]Y`78I `F \Y]b`UbX!DZU`n`Uh`i bhYf`XYf`@Y]hi b[ `XYg`bYi Yb  
DUfhY]j cfg]hnYbXYb` ; cfXcb`GW`b]YXYf`nYbhU`Y`H\Ya Yb`]bg`J ]g]Yf  
[ Ybca a Ybž`X]Y`]a `VYj c fghY\YbXYb`K U\`\_Ua dZ`Y]bY  
GW`ØggY`fc`Y`gd]Y`Yb`k YfXYb`"GW`b]YXYfž`XYf`Ui W`]a `@UbXhU[  
U`g`C ddcg]h]cbgZØ\fyf`U[ ]Yfhž`g]Y\h`Xf]b[ YbXYb`< UbX`i b[ gVYXUfZ  
]b`XYb`6YfY]W`Yb`6]`Xi b[ ž`A ] [ fUh]cb`i bX  
; Ygi bX\Y]hgj Yfgcf[ i b[ "8]YgY`XfY]: UW`hhYb`g]bX`gY]bYf  
A Y]bi b[ `bUW`Yb`hgW`Y]XYbXž`i a `X]Y`XYfnY]h][ Y`I bni Zf]YXYb\Y]h  
]a `@UbX`ni `UXfYgg]YfYb"

⇒Y]bYa `Øfn`]W`[ YZØ\fhYb` ; Ygdf`ÅW`a ]h`XYf`8Yi hgW`Yb`DfYggY!  
5[ Ybhi f`]b`A U]bn`VYhcbhY`GW`b]YXYfž`XUgg`Yg`\_Y]bY`Z]bUb]n]Y`Yb  
9b[ d`ÀggY`]a `@UbX`[ YVY`"J ]Y`a Y\f`[ Y\Y`Yg`XUfi a ž`X]Y`f]W`h][ Yb  
Df]cf]h`hYb`ni `gYhnYb`i bX`X]Y`U`\_hi Y`Yb` : Y\`Yb`hk ]W`\_i b[ Yb`\_`Uf  
ni `VYbYb`bYb`"6YgcbXYfY`5i Za Yf\_gUa \_Y]h[ ]`h`XYa  
6]`Xi b[ ggY`\_hcfž`]b`XYa `Yg`\_Ui h`GW`b]YXYf`gY]h`Y\`fYb`ghU[ b]YfhY  
9b`hk ]W`\_i b[ Ybž`]bgVYgcbXYfY`VY]a `GdfUW`Yfk YfV`j`cb`?]bXYfbž  
[ YVY`"8Yf` : fU`\_h]cbgj c f g]hnYbXY`ZcfXYfhY`j YfV]bX`]W`Y  
GdfUW`hYghgž`i a `g]W`Yfni ghY`Ybž`XUgg`U`Y`?]bXYf`X]Y`XYi hgW`Y  
GdfUW`Y`Ui`gfY]W`YbX`VY\YffgW`Yb"

A ] [ fUh]cb`i bX` ⇒bhY [ fUh]cb`U`g`Xf`Àb [ YbXY  
H\Ya Yb

8 Ug`H\Ya U`A ] [ fUh]cb`]gh`ZØf`X]Y`A YbgW`Yb`]b`F \Y]b`UbX!DZU`n]j`cb

[fc»Yf'6YXYi hi b["GWk]YXYf'ZcfXYfhY'Y\`f]WY'5bhk cfhYb'j cb  
XYf'@UbXYgfY[ ]Yfi b[ 'i bX'a UWk hY'Ui ZX]Y'DfcV`Ya Y'Ui Za Yf\_gUa ž  
X]Y'Xi fWk`Y]bYb'A Ub[ Y`Ub`K c\bfUi a`ZØf'; YZØWk hYhY  
YbhghY\Yb" K ]f'a ØggYb`X]Y'A YbgWk Yb`Yfgh`XUbb`Ui ZX]Y  
?ca a i bYb'j YfhY]Ybž'k Ybb`g]Y`Y]b`6`Y]VYfYWk h`\UVYb ž`VYhcbhY  
Yfž'k Ug`Y]bY'; fi bX`U[ Y`ZØf`YfZc`[ fY]Wk Y`hY[ fUh]cb`XUfghY`h`6Y]  
XYf`hY[ fUh]cb`\_ca a Y`Yg`Ui Wk`Ui Z`\_UfY`\_ca a i bU`Y  
FY[ Y'i b[ Yb`Ubž'i a`XYb'; YZØWk hYhYb`Y]b`g]Wk YfYg'i bX`ghUV]Yg  
I a Z`X`ni`V]YhYb"

Ni XYa`a Yf\_hY`XYf'78I !; YbYfU`gY\_fYh`f`Ubž`XUgg`X]Y  
?f]a ]bU`]h`h`i bhYf`A ][ fUbhYb`]b`F`Y]b`UbX!DZU`n`ØVYfd`fcdcfh]cbU`  
\cWk`gY]ž'k Ug`Y]bYb`ni g`h`n]Wk Yb`<UbX`i b[ gVYXUfZ`\]bg]Wk h]Wk  
XYf`G]Wk Yf\Y]h`i bX`XYg`G]Wk Yf\Y]hg[ YZØ`\`g`XYf`6Øf[ Yf`a`]h`g]Wk  
Vf]b[ Y`"GWk]YXYf'ZcfXYfhY]b`Y]b`Y]h]Wk Yg`J cf[ Y\Yb`VY]`XYf  
9]bZØ\fi b[ `XYf`6YnU\`\_UfhY`ZØf'; YZØWk hYhYž'k A`fYbX`X]Y  
@UbXYgfY[ ]Yfi b[ `]b`X]YgYf'5b[ Y`Y[ Yb`Y]h`V]g`Yf`\_Y]bY`\_UfY  
Dcg]h]cb`VYnc[ Yb`\Uh"

## GWk k ]Yf][ \_Y]hYb`]a` ; Ygi bX`Y]hggY`hc f

9]b`k Y]hYfYg`nYbhfU`Yg`5b`]Y[ Yb`j cb`GWk]YXYf`]gh`X]Y  
ni bY`a YbXY`DfcV`Ya Uh]\_`]a` ; Ygi bX`Y]hggY`YgYb"8]Y`78I`g]Y`h  
Y]b`d`Ub`cgYg`?fUb`\_Yb`Ui gghYfVYb`U`g`Yfbgh`UZhY`6YXfc`\i b[ `ZØf  
X]Y'; Ygi bX`Y]hggY`Yfgcf[ i b[ ž]bgVYgcbXYfY`]b``AbX`]Wk Yb  
; YV]YhYb"8]Y`@UbXYgfY[ ]Yfi b[ `a`ØggY`g]Wk YfghY`Ybž`XUgg`X]Y  
A YbgWk Yb`Y]bYb`Ni [ Ub[ `ni`a`YX]n]b]gWk Yf'; fi bX] Yfgcf[ i b[  
\UVYb"GWk]YXYf`ghY`hY`\_Ufž`XUgg`X]Y`J YfUbhk cfhi b[ `ZØf`X]Y  
?fUb`\_Yb`Ui gd`Ubi b[ `VY]`XYf'@UbXYgfY[ ]Yfi b[ `]Y[ Y'i bX  
\_f]h]g]YfhY`Y]bY`i bni fY]Wk YbXY': ØfXYfi b[ `]cb  
?fUb`\_Yb`Ui g]bj Ygh]h]cbYb"

8Yf`bYi Y`A ]b]ghYfd`f`Ag]XYbh`\Uh]j cb`Y]bYf'5\_nYbhj YfgWk ]YVi b[  
[ YgdfcWk Ybž`UVYf`k ]f`gY`Yb`bcWk`\_Y]bY`YWk hYb`J Yf`AbXYfi b[ Yb`ž  
gd]Y`h`GWk]YXYf`Ui ZX]Y`5b`\_ØbX][ i b[ `]cb`5`YI UbXYf`GWk k Y]hYf  
Ub"8Yf`C ddcg]h]cbgZØ\Yf`]gh[ YgdUbbh`Ui ZX]Y`YfghY  
FY[ ]Yfi b[ gYf`\_`Åfi b[ ž`X]Y`bUWk`XYf`dUf`Ua`YbhUf]gWk Yb  
Gca a YfdUi gY`]a`@UbXhU[ `ghUhh]bXYb`gc`""<]Yf`k ]fX`Yfk UfhYhž

XUgg`\_cb\_fYhY`D`ÀbY`ni f`J YfVYggYfi b[ `j cb`6]`Xi b[ žA ] [ fUh]cb  
i bX` ; Ygi bX\Y]hj cf[ YghY``hik YfXYb"

9]b`dc`]h]gW\`Vf]gUbhYg`H\Ya U`]gh`X]Y`<U`hi b[ `XYf`78I` ` [ Y[ YbØVYf  
XYf`5Z8`"GW\ b]YXYf`Yf`\_`ÀfhYž`XUgg`Yg`\_Y]bY`Ni gUa`a`YbUfVY]h`a` ]h  
XYf`5Z8` [ YVYb`k`YfXY`i`bX`X]Y`7\`f]ghXYa`c`\_fUhYb`Ui`W\`k`Y]hYf\`]b  
\_`UfY`5V[ fYbni b[ Yb`ni`X]YgYf`DUfhY]`n]Y\Ybž`i`a`J`YfhfUi`Yb`VY]  
XYb`K`À\`Yfb`ni`fØW`ni` [ Yk`]bbYb"

## K ]W\ h][ \_Y]h`X`Yf`H\`Ya`Yb`]a`K`U\`\_Ua`dZ

8]Y`Yf`\_YbbVUFY` :`c`\_i`gg]Yfi b[ `Ui`Z`6]`Xi b[ žA ] [ fUh]cb`i`bX  
; Ygi bX\Y]h`XYi`hYh`Ui`Z`Y]bY`ghfUhY[ ]gW\Y`5i`gf]W\hi b[ `j`cb  
GW\ b]YXYf`\`]bž`X]Y`Ui`Z`X]Y`6YXØfZb]ggY`i`bX`Gcf[ Yb`XYf`6Øf[ Yf  
fYU[ ]Yfh`9g`V`Y]Vh`UVni`k`UfhYbž`k`]Y`g]W\`X]Y`dc`]h]gW\Y`@UbXgW\UZh  
]b`F`\Y]b`UbX!DZU`n`Yb`hk`]W`\_Y`b`k`]fX`i`bX`c`V`X]Y`78I` `]b`XYf`@U[ Y  
gY]b`k`]fXž`XYb`K`À\`Yfb`ØVYfnYi` [ YbXY`@Øgi`b[ Yb`Ubni`V]YhYb"  
6YgcbXYfg]b`NY]hYb` [ YgY``gW\UZh]W\Yf`J`Yf`AbXYfi`b[ Yb`g]b`X`X]Y  
5bgdfUW\Yb`XYf`DUfhY]j`cfg]hnYbXYb`j`cb` [ fØ»`hYf`6YXYi`hi`b[ ž`i`a`  
J`YfhfUi`Yb`i`bX` ; `Ui`Vk`ØfX][ \_Y]h`ni`fØW`ni` [ Yk`]bbYb"

## 6]`Xi`b[`ggmghYa` `]b`F`\Y]b`UbX!DZU`n.`9]bY 5bU`mgY

8]Y`6]`Xi`b[`gdc`]h]\_`]b`F`\Y]b`UbX!DZU`n`\Uh]b`XYb`Y`hnhYb`Y\`fYb  
ni`bY`a`YbXY`5i`Za`Yf`\_gUa`\_Y]h`Yf`Ub[`hž`]bgVYgcbXYfY`Ui`Z[`fi`bX  
j`cb`<`YfUi`gZcfXYfi`b[ Yb`k`]Y`XYb`ghY][ YbXYb`G]hnYbV`Y]VYfei`chYb  
i`bX`XYf`GdfUW\VY\YffgW\i`b[ `VY]?]bXYfb`"8]Y`8]g`\_i`gg]cb`i`a  
j`YfV]bX`]W\Y`GdfUW\hYghg`j`YfXYi`h]W\h`X]Y`Xf]b[ YbXY  
B`chk`YbX][ \_Y]h`ZØf`ghfi`\_`hi`f]YfhY`A`U»`bU`a`Yb`ni`f`J`YfVYggYfi`b[  
XYf`GdfUW`\_ca`dYhYbnž`X]Y`ZØf`X]Y`ϕ`hY[ fUh]cb`XYf`GW\Ø`Yf`j`cb  
Yb`hgW\Y]XYbXYf`6YXYi`hi`b[ `]gh`9]bY`Ghi`X]Y`XYg`ϕ`gh]hi`hg`ZØf  
6]`Xi`b[`gUbU`mgYb`F`\Y]b`UbX!DZU`n`nY][`hž`XUgg`?]bXYf`a`]h  
A][`fUh]cb`g\]b`hYf[`fi`bX`c`Zi`GW\k`]Yf][`\_Y]hYb`\UVYbž`XYb`@Y\`fg`hc`Z  
ni`j`YfZc`[ Ybž`k`Ug`g]W\`]b`XYb`@Y]ghi`b[ gi`bhYfgW\]YXYb  
b]YXYfgW`À[`h"

9]b`k Y]hYfYf`5gdY`h]gh`X]Y`X][ ]hU`Y`5i` gghUhi b[ `XYf`GW`i` `Yb`ž`X]Y  
U`g`YggYbn]Y``ZØf`X]Y`7`UbW`b[ `Y]W`X`Y]h`i` bX`X]Y  
Ni`\_i` bZhgZ`A`][`\_Y]h`X]Yg`6`]Xi` b[ ggmghYa` g`YfUW`hY`h`k` ]fX``8Yf  
8][ ]hU`DU`h`GW`i` `Yž`XYf`XYb`GW`i` `Yb`]b`8Yi` hgW`Ub`X`Z]b`Ub]Y``Y  
A`]hY``ni` f`J`YfZØ[ i` b[ `ghY``hž`\Uh]b`F`\Y]b`Ub`X!DZU`n`V]g`Ub[ `b]W`h  
X]Y`[`Yk`ØbgW`hY`K` ]f`\_i` b[ `YnY][`h``J]Y`Y`GW`i` `Yb`\_`U[`Yb`ØVYf  
ZY`\`Yb`XY`hY`W`b]gW`Y`≠ZfUghfi`\_hi`fž`k`Ug`X`Uni`ZØ`fhž`X`Ugg`X]Y  
GW`Ø`Yf`b]W`h`c`d`h]a`U``Ui`Z`X]Y`X][ ]hU`Y`K`Y`h`j`c`fVYfY]hY`h`k`YfXYb`"

8Yf`Ni`ghUb`X`XYf`; Ygi`bX`\Y]hgd`c`]h]\_`]b`Äb`X`]W`Y`b  
F`Y[ ]cb`Y`b

F`\Y]b`Ub`X!DZU`n`ghY`\h]c`f`XYf`<YfUi`gZcfXYfi`b[ ž`gY]bY  
; Ygi`bX`\Y]hgj`Yfgcf[ i` b[ `]b`Äb`X`]W`Y`b`; YV]YhYb`g]W`Y`fni`ghY``Yb`"  
8]Y`GW`i`Y»i` b[ `j`cb`?fUb`\_Yb`\Äi`gYfb`i`bX`5VhY]i`b[`Yb`\Uh`b]W`h  
bi`f`5i`gk`]f`\_i` b[`Yb`Ui`Z`X]Y`a`YX]n]b]gW`Y`J`Yfgcf[ i` b[ ž`gcb`XYfb  
Ui`W`\_Ui`Z`X]Y`@VYbgei`U`]hÄh`XYf`6Yk`c`\bYf`"@Ui`h`XYa`\_U`\_hi`Y``Yb`  
?fUb`\_Yb`\Ui`gYf`dc`fh`XYg`K`]ggYbgW`UZh]W`Y`b`≠gh]hi`hg`XYf`5C`?  
fK`≠C`Ł]gh]b`Y]b][`Yb`Äb`X`]W`Y`b`F`Y[ ]cb`Y`b`XYf`5bhY]`\_Ub  
a`YX]n]b]gW`i`bhYfj`Yfgcf[`hYb`; YV]YhYb`g][`b]Z]\_Ub`h[`Ygh]Y[`Yb`"

8]Y`B`chk`Yb`X][`\_Y]h`ni`f`Ghfi`\_hi`f]Yfi`b[ `XYf`?fUb`\_Yb`\Ui`gd`Ubi`b[  
k`]fX`X`U`\Yf]a`a`Yf`Xf]b[ `]W`Y`fž`i`a`X]Y`a`YX]n]b]gW`Y  
; fi`bXj`Yfgcf[ i` b[ `Ui`ZfY`W`hni`Yf`\U`hYb``8]Yg`i`a`ZUggh`gck`c`\`X]Y  
J`Yf`U[`Yfi`b[ `j`cb`F`Yggci`fW`b]b`YfZcfXYf`]W`Y`6YfY]W`Y`U`g`Ui`W`  
X]Y`6YfY]hgY``i`b[ `j`cb`5b`fY]nYb`ZØf`Y`fnhYž]b`Äb`X`]W`Y`b`; YV]YhYb  
ni`d`fU`\_h]n]YfYb``8]Y`U`\_hi`Y``Y`Dc`]h]\_ž`X]Y`c`Zh`U`g`fYU`\_h]j`VYnY]W`b`Y`h  
k`]fXž`a`i`gg]b`Y]b`Yb`d`fc`U`\_h]j`Yb`5bgUhm`i`a`[`Yk`Ub`XY`h`k`YfXYbž`i`a  
X]YgY`D`fc`V`Ya`Y`b`U`W`\`U`h][`ni`U`X`fY`gg]YfYb`"

A`][`fUh]cb`i`bX`≠bhY[`fUh]cb.  
<YfUi`gZcfXYfi`b[`Yb`]a`\_U`\_hi`Y``Yb`?`cb`hYI`h

8]Y`8]g`\_i`gg]cb`i`a`A`][`fUh]cb`i`bX`≠bhY[`fUh]cb`]gh`Y]b`nYb`hfU`Y`g  
H`\Ya`U`]b`F`\Y]b`Ub`X!DZU`n``8]Y`7`8I`ZcfXYfh`Y]bY`ghÄf`\_YfY  
6YfØW`\_g]W`h][`i`b[ `XYf`K`c`\b`fUi`a`d`fc`V`Ya`Uh]\_`ZØf`; YZØW`hY`hYž`X`U  
XYf`K`c`\bi`b[`ga`Uf`\_h]b`j]Y`Y`b`GhÄX`hYb`ghUf`\_`Ub[`Ygd`Ub`bh]gh``@Ui`h

XYa 'æ a cV]YbFYdcfhj cb '&\$&' \Uh]g]W\XYf'A ]YhdFY]g]b  
ghÅXh]gWYb'; YV]YhYb'j cb 'F \Y]b'UbX!DZU'n']b'XYb'YhnhYb'ZØbZ  
X\Yb'i a 'Xi fW\gW\h]W\&) 'i 'Yf\Ø\hž'k Ug'X]Y  
K c\bi b[ gg]hi Uh]cb'ZØf'BYi fcj ]Y'Y'A YbgWYb'ni gÅh'n]W  
YfgW\k Yfh"

9]b'nYbhfU`Yf'5gdY\_h'XYf'æhY[ fUh]cb']gh'X]Y'[ YgY`gW UZh']WY  
5\_nYdhUbn'i bX'XUg'G]W\Yf\Y]hg[ YZØ\`XYf'6Øf[ Yf"i a 'X]Y  
?f]a ]bU']hÅh'ni 'VY\_Åa dZYb'i bX'Y]b'; YZØ\`XYf'G]W\Yf\Y]h'ni  
ZØfXYfbž'g]bX'dfÅ]Ybh]j Y'A U» bU\ a Yb'i bX'hfUbgdUfYbhY  
dc`h]gWY'?ca a i b[\_Uh]cb'[ YZcfXYfh"8 ]Y'HUhgUW\Yž'XUgg'X]Y  
K U\fbY\ a i b[ 'j cb'G]W\Yf\Y]h'ghUf\_j cb'dYfgØb`]WYb  
9fZU\fi b[ Yb'i bX'A YX]YbVYf]W\hYb'VYY]bZi ggh'k ]fXž'i bhYfgfhY]W\h  
X]Y'6YXYi hi b[ 'Y]bYf'cZZYbYb'i bX'Y\f']WYb'8YVUhhY'ØVYf  
A ][ fUh]cbgh\Ya Yb"

; Ya Å» 'Y]bYf'i a ZfU[ Y'XYg'8Yi hgWYb'ægh]hi h'ZØf'Bcfa i b[ 'Y"J "  
fB ÆŁ'Ui g'XYa 'X\ f'&\$&' gY\Yb'\*) 'i 'XYf'6YfU[ hYb'X]Y  
æhY[ fUh]cb'j cb'A ][ fUbhYb'U`g'k ]W\h][ Yg'[ YgY`gW UZh']WYg'N]Y`  
Ubž'YXcW\Ya dZ]bXYb'bi f" , 'i 'X]Y'VYghY\YbXYb'A U» bU\ a Yb  
U`g'Ui gfY]WYbX"8 ]Yg'nY][ h'X]Y'8 ]g\_fYdUbn'nk ]gWYb'XYf  
K U\fbY\ a i b[ 'XYf'<YfUi gZcfXYfi b[ Yb'i bX'XYb  
k U\ f[ Ybca a YbYb'dc`h]gWYb'@Øgi b[ Yb"

8YhU]`g

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