

5`h`k YfXYb`Y]W\hfYfL`[ Ya UW h .  
J c fhfU[ gfY]\Y`ni f`VYggYfYb  
@YVYbgd`Ubi b[

B Yi Y`J c fhfU[ gfY]\Y`b`XYb`GhUXhV]V`]ch\Y\_Yb`K ]YgVUXYb`ni  
XYb`H\Ya Yb`Y`hYfk YfXYbž`GY`VghÅbX][ \_Y]h`i bX`DZY[ Y`  
\_cghYbZfY]`i bX`]bZcfa Uhj] "

8]Y`<YfUi gZcfXYfi b[ Yb`XYg`Y`hYfk YfXYbg`k YfXYb`cZh  
i bhYfgW\Åhnh"; YfUXY`]b`Y]bYf`gW\ bY`YV][ Yb`K Y`hž`]b`XYf  
hYW\bc`c [ ]gW\Y`i bX`[ YgY`gW\UZh]W\Y`J YfÅbXYfi b[ Yb`i bgYf  
hÅ[ `]W\Yg`@YVYb`VYY]bZi ggYbž`]gh`Yg`k ]W\h][ ž`g]W\`]bhYbg] ]a ]h`XYf  
: fU[ Y`Ui gY]bUbXYfni gYmYbž`k ]Y`a Ub`Ui W`]a `5`hYf  
gY`VghVYgh]a a h`YVYb`\_Ubb""9]bY`bYi Y`J c fhfU[ gfY]\Y`b`XYb  
GhUXhV]V`]ch\Y\_Yb`n]Y`h[ YbUi`XUfUi Z`UV`i bX`V]YhYh`k Yfhj`c`Y  
≠Zcfa Uh]cbYbž`i a `X]YgY`<YfUi gZcfXYfi b[ Yb`VYggYf`ni `a Y]ghYfb"

I bhYf`XYa `H]hY` 5`h`k YfXYb`Y]W\hfYfL`[ Ya UW h `V]YhYh`X]Y  
GhUXhV]V`]ch\Y`\_K ]YgVUXYb`Y]bY`D`UhhZcfa ž`Ui Z`XYf`g]W\`X]Y  
6Øf[ Yf]bbYb`i bX`6Øf[ Yf`i a ZUggYbX`ØVYf`X]Y`j YfgW\]YXYbYb  
5gdY`hY`XYg`Y`hYfk YfXYbg`]bZcfa ]YfYb`\_ØbbYb""8]YgY`≠]h]Uhj] Y  
]gh`VYgcbXYfg`k ]W\h][ ž`XU`g]Y`Yg`Yfa Ò[ `]W\hž`Y][ YbY`: fU[ Yb`ni  
ghY`Yb`i bX`X]fY`hYb`?cbhU`h`ni `9l dYfhYb`Y`fni ghY`Ybž`X]Y`]b  
]fYb`J c fhfÅ[ Yb`dFU`h]gW\Y`H]ddg`i bX`F`UhgW\`Å[ Y`[ YVYb"

H\Ya Ybj ]Y`ZU`h`XYf`J c fhfU[ gfY]\Y

8]Y`J c fhfÅ[ Y`Z]bXYb`]a` [ Ya Øh]W\Yb`@YgYWUZÅ`XYf`GhUXh`i bX  
A i g]\_V]V`]ch\Y`\_]b`XYf`A`Ui`f]h]i`g]A`YX]Uh\Y`\_ž`<c`W\ghÅhYbghfU»Y  
\*!%\$ž`ghUhh""5`Y`≠bhYfYgg]YfhYb`g]bX`Y`fn`]W\`Y]b[ Y`UXYbž`XUfUb  
hY]`ni bY`a`Yb`X]Y`HY]`bU`a`Y`]gh`\_cghYb`cgž`k`Ug`X]YgY`F`Y]\Y  
VYgcbXYfg`ni [ Åb[ `]W\`a`UW`h""8]Y`Ni`gUa`a`YbUfVY]h`nk`]gW\Yb

XYb'6YfUhi b[ gghY''Yb'Z0f'gY'VghAbX][ Yg'@YVYb']a'5'hYf'i bX'XYf  
6YfUhi b[ gghY''Y'Z0f'VUff]YfYZfY]Yg'K c\bYb'nY][ h'Y]b'ghUf\_Yg  
9b[ U[ Ya Ybh'Z0f'X]Y'6Y'Ub[ Y'À'hYfYf'A YbgWXYb"

8]Y'J cfhfU[ gfY]\Y'i a ZUggh'Y]bY'J ]Y'nU\''fY'Yj UbhYf'H\Ya Ybž'X]Y  
Ui ZX]Y'6YX0fZb]ggY'j cb'À'hYfYb'A YbgWXYb'ni [ YgWXB]hhYb'g]bX"  
5a'8cbbYfghU[ ž'XYb'%'&"GYdhYa VYfž'k ]fX'XYf'J cfhfU[ ' Gc'hY' ]W  
a ]W' b]W'h'Ub[ gUa' j cfVYfY]hYb3' j cb'XYb'FYZYfYb'hYb'F\YU  
@Y[ Uh]g'i bX'H\ca Ug'A 0''Yf'[ Y\U'hYb'"8]YgYf'9]bgh]Y[ '[ ]Vh'Y]bYb  
, VYfV' ]W\_ 0VYf'X]Y'6YXYi hi b[ 'XYf'Zf0\ nY]h][ Yb'D'Ubi b[ 'Z0f'Y]b  
gY'VghAbX][ Yg'@YVYb"

K Y]hYf'[ Y\h'Yg'Ua'8cbbYfghU[ ž'XYb'%'\$'C\_hcVYfž'a ]h'XYa  
J cfhfU[ ' ?'Y]bY'<Y'ZYf'Y]b.'5''hU[ g\]'ZYb'i bX'<]'Zga ]hhY''Z0f'a Y\ f  
GY'VghAbX][ \_Y]hi bX'?ca Zcfh' j cb'B]Wc'Y'6fi W\Ài gYf'"<]Yf  
\_0bbYb'X]Y'HY]'bY\ a Yf]bbYb'i bX'HY]'bY\ a Yf'YfZU\ fYbž'k Y'WXY  
<]'Zga ]hhY''XYb'5''hU[ 'Yf'Y]W'hYfb'i bX'k ]Y'g]Y'X]YgY'YZZY\_hj  
bi hYb'\_0bbYb"

9VYbZU''g'j cb'[ fc»Yf'FY'Yj Ubn'g]bX'X]Y' ðZcfa Uh]cbYb'ni  
GY\Y]bgWxfAb\_i b[ Ybž'X]Y'Ua'8cbbYfghU[ ž'XYb'+''Bcj Ya VYfž'j cb  
B]Wc'Y'6fi W\Ài gYf'i bX'H\ca Ug'GUi Yf'h\Ya Uh]g]Yfh'k YfXYb"  
5VgW' ]Y»YbXž'Ua'8cbbYfghU[ ž'XYb') "'8YnYa VYfž'[ ]Vh'Yg'Y]bYb  
gY\ f'dfU\_h]gWXYb'J cfhfU[ ' 0VYf' DZY[ Y'ni '<Ui gY' 'k Ug'U''Yg  
a 0[ ' ]W' ]gh ž'dfÀgYbh]Yfh'j cb'6Yhh]bU'GhYi XbYf!DZUZZ'i bX'i fgi 'U  
@Ub[ Yf'"8]YgYf'J cfhfU[ ' VY'Yi W'hYh'X]Y'j YfgW]YXYbYb' Cdh]cbYbž  
X]Y'Yg'ja'6YfY]W'XYf'\Ài g' ]WXYb'DZY[ Y'[ ]Vh'i bX'k ]Y'a Ub'X]YgY  
]b'5bgdfi W' bY\ a Yb'\_Ubb"

## 8]Y'6YXYi hi b[ 'XYf'J cfVYfY]hi b[

8]Y'\_f]h]gWXY'5i gY]bUbXYfgYhni b[ 'a ]h'XYa 'Y'hYfk YfXYb' ]gh'j cb  
Ybcfa Yf'6YXYi hi b[ "'>'Zf0\ Yf'g]W' ðhYfYgg]YfhY'XUa ]h  
VYgW'ÀZh][ Ybž'XYghc'k U\ fgWXY]b' ]WXYf' ]gh'Ygž'XUgg'g]Y'\ fY  
@YVYbgei U' ]h'Àh'ja'5'hYf'VYk U\ fYb'\_0bbYb'"8i fW'X]Y'J cfhf'À[ Y  
Yf\ U'hYb'g]Y'k Yfh'j c''Y'9]bg]W'hYb'i bX'XUg'bc'hk YbX][ Y'K ]ggYbž  
i a' ]bZcfa ]YfhY'9bhgWXY]Xi b[ Yb'ni 'hfYZZYb'"A ]h'XYf'f]W'h][ Yb  
l bhYfgh0hni b[ 'i bX' ðZcfa Uh]cb'\_Ubb'XUg'Y'hYfk YfXYb'b]W'h'bi f

Y]bZUWYfž'gcbXYfb'Ui W'Ub[ YbY\ a Yf'i bX'YfZØ'hYf'[ YghU'hYh  
k YfXYb"

⊕'Y]bYf'NY]hž']b'XYf'k ]f'À'hYf'k YfXYb'i bX'X]Y'; YgY'gWUZh  
ni bY\ a YbX'À'hYf'k ]fXž'V]YhYb'gc'WY'⊕]h]Uh]j Yb'YbHgWY]XYbXY  
<]'ZY'i bX'c f]Ybh]Yfi b[ "A YbgWYbž'X]Y' ]b' ]\fY'Ni \_i bZi]bj Ygh]YfYb  
k c''Ybž'gY]'Yg']b'6Yni [ 'Ui Z'; Ygi bX\Y]hž'GY'VghÀbX][ \_Y]h'cXYf'X]Y  
Y][ YbY'K c\bg]hi Uh]cbž'gc''hYb'X]Y'; Y'Y[ Yb\Y]h'bi hnYbž'i a 'Ub  
X]YgYb'J YfUbghU'hi b[ Yb'hY]'ni bY\ a Yb''8]Y'J cfhfU[ gfY]\Y' \_ÖbbhY  
XYf'YfghY'GWf]h]b'Y]bY'gY'VghVYgh]a a hY'; YghU'hi b[ 'XYg'@YVYbg  
]a '5'hYf'gY]b' 'i bX'XUg'[ Ub'n'c\ bY'?cghYbVY]hfU[ "

## 9]b'GWf]hh']b'F]W]hi b[ 'GY'VghVYgh]a a i b [

8]Y'A Ö[ 'W\_ Y]hž'Y][ YbY': fU[ Yb'Ub'9I dYfhYb'ni 'f]W'hYbž'i bX'XYf  
5i ghUi gW'a ]h'; 'Y]W[ Yg]bbhYb'g]bX'ni gÀhn'WY'J cfhY]'Yž'X]Y  
X]YgY'J cfhfU[ gfY]\Y'V]YhYh''8 Ug'; YZØ\ž'b]W]hiU''Y]b'ni 'gY]bž'k Ybb  
Yg'i a 'X]Y'<YfUi gZc fXYfi b[ Yb'XYg'5'hYfg'[ Y\hž'\_Ubb'VYfY]hg'Y]bY  
[ fc»Y'9bh'Ughi b[ 'Vf]b[ Yb''8]YgY'J YfUbghU'hi b[ Yb'g]bX'b]W]h'bi f  
Y]bY'⊕Zcfa Uh]cbgei Y''Yž'gcbXYfb'Ui W'Y]bY'7\UbWž'g]W'a ]h  
UbXYfYb'Ui gni hUi gWYb'i bX'j cb'XYfYb'9fZU\fi b[ Yb'ni 'YfbYb''⊕  
Y]bYf'; YgY'gWUZhž'X]Y' ]a a Yf'À'hYf'k ]fXž']gh'Yg'YbHgWY]XYbXž  
gc'WY'FYggci fW'b'ni 'gWUZZYb'i bX'ni 'bi hnYb"

## 8]Y'6YXYi hi b[ 'j cb'DfÀj Ybh]cb']a '5'hYf

⊕'i bgYfYf'gWbY''YV][ Yb'K Y'h'k ]fX'cZi'ØVYfgY\Ybž'k ]Y'k ]W]h][  
DfÀj Ybh]cb'ZØf'XUg'Y'hYfk YfXYb' ]gh''Ghi X]Yb'nY][ Ybž'XUgg'Y]b  
U\_h]j Yf'@YVYbggh]'i bX'fY[ Y'a À»][ Y' [ Y]gh][ Y'gck ]Y' \_ÖfdYf'WY  
6YhÀh][ i b[ 'ja '5'hYf'YggYbn]Y''g]bXž'i a 'X]Y'@YVYbgei U'hÀh'ni  
Yf\Ö\Yb'i bX'X]Y'GY'VghghÀbX][ \_Y]h'ni 'Yf\U'hYb''@Ui h'XYf  
6i bXYgnYbhU'Y'ZØf'[ Ygi bX\Y]h]WY'5i Z\_Àfi b[ '\UVYb'À'hYfY  
A YbgWYbž'X]Y'g]W'fY[ Y'a À»][ 'VYk Y[ Ybž'Y]b'XYi h]W' [ Yf]b[ YfYg  
F]g]\_c'ZØf'Wfc b]gWY'9f\_fUb\_i b[ Yb'k ]Y'8]UVYhYg'cXYf'<Yfn!  
'fY]g'Ui Z9f\_fUb\_i b[ Yb''8]Yg'i bhYfghfY]W]h'X]Y'Bchk YbX][ \_Y]hž  
fYW]hnY]h][ 'U\_h]j 'ni 'k YfXYb'i bX'9bhgWY]Xi b[ Yb'ni 'hfYZZYbž'X]Y  
Y]b'gY'VghVYgh]a a hYg'@YVYb' ]a '5'hYf'i bhYfghØhnYb"

9]b`k Y]hYfYf`k ]W`h][ Yf`5gdY`\_h`XYf`Df`Aj Ybh]cb` ]gh`X]Y`6]`Xi b["  
`X`XYf`J`c`fhfU[ `XYf`F`Y]\`Y` 5`h`k`Yf`XYb`Y`]W`hfYfL`[ Ya UW`h`n]Y`h  
XUfUi Z`UVž`HY]`b`Y`a` Yf`ØVYf`X]Y`<`YfUi gZc`f`XYfi b[ Yb`XYg`5`hYfg`ni  
]bZc`fa` ]YfYb`i`b`X`ni` `Yfa` i`h][ Ybž`Y][ YbY`9b`hgW`Y]Xi b[ Yb`ni  
hfY`ZYb``8`i`fW`X`Yb`5`i` ghUi gW`j`cb``bZc`fa` Uh]cbYb`i`b`X`XUg`HY]`Yb  
j`cb`9fZ`U`fi b[ Yb`\_ØbbYb`j` ]Y`Y`Y`b[ ghY`i`b`X`l`bg]W`Yf`Y]hYb  
UV[ YVUi h`k`Yf`XYb``

## F Yggci fW`b`ZØf`XUg`gY`Vghgh`Àb`X][ Y`@YVYb`]a 5`hYf`

Ø`8`Yi` hgW`U`b`X`[ ]Vh`Yg`n`U`\`fY]W`Y`F`Yggci` fW`b`i`b`X  
8]Yb`gh`Y]ghi`b[ Ybž`X]Y`À`hYfYb`A`Yb`gW`Yb`Y`Y`Z`Ybž`Y]b  
i`b`UV`À`b`[ ]Yg`i`b`X`Yf`ZØ`hYg`@YVYb`ni`ZØ`fYb``8]Y  
6YfUhi`b[ gghY`Y`b`ZØf`gY`Vghgh`Àb`X][ Yg`@YVYb`]a`5`hYf`V]YhYb  
i`a`ZUggYb`XY`Ø`Zc`fa` Uh]cbYb`ni`j`YfgW`]Y`XYb`Yb`H`Y`a`Ybž`X]Y`ZØf  
X]Y`N]Y`[ fi`ddY`fY`Y`j`Ub`h`g]b`Xž`k`]Y`a`Y`X]n]b]gW`Y`J`Yfgc`f`i`b[ ž  
gc`n]U`Y`B`Y`h`k`Yf`\_`Y`i`b`X`f`Y`W`h`]W`Y`:`fU[ Yb``Gc`W`Y`G`hY`Y`b  
Yfa`Ø[ `]W`Yb`Y`g`À`hYfYb`A`Yb`gW`Yb`ž`g]W`U`\_`h]j`a`]h`]\`fYf  
@YVYb`gg]hi`Uh]cb`Ui`gY]b`Ub`XYfni`gY`h`n`Yb`i`b`X`b`c`h`k`Yb`X][ Y  
A`U`»`b`U`a`Yb`ni` `Yf[ fY]Z`Ybž`i`a`]\`fY`@YVYb`gei`U`]h`À`h`ni`j`Yf`V`Y`gg`Y`fb``

Ni`g`À`h`n`]W`i`b`hYfgh`Ø`h`n`Yb`j` ]Y`Y`C`f[ Ub]gUh]cbYbž`k`]Y`XUg`8`Yi` hgW`Y  
F`c`hY`?`fYi`n`c`X`Yf`X]Y`7`Uf]hUgž`À`hYfY`A`Yb`gW`Yb`X`i`fW`  
j`YfgW`]Y`XYb`Y`D`fc[ fUa`a`Y`ž`X]Y`j`cb`B`U`W`V`U`f`g`W`U`Z`h`g`\`]Z`Y`V]g`ni  
gd`Y`n]Y`Y`b`:`fY]n`Y]h`Ub[ YV`c`h`Y`b`f`Y]W`Yb``8]YgY`5`b[ YV`c`h`Y`ZØ`f`XYfb  
gc`n]U`Y`?`cb`h`U`\_`hY`i`b`X`\`Y`Z`Ybž`g`c`Uh]cb`Yb`h[ Y[ Yb`ni`k`]f`\_`Ybž`k`Ug  
Y]b`Yb`Yb`hgW`Y]X`Yb`X`Yb`9]b`Zi`gg`Ui`Z`XUg`Ya`ch]cb`U`Y`K`c`\`V`Y`Z]b`X`Yb  
À`hYfYf`A`Yb`gW`Yb`\`Uh``

## 9]bg]W`hYb`]b`X]Y`X`Ya`c[ fUZ]gW`Y 9b`hk` ]W`\_`i`b[

8]Y`X`Ya`c[ fUZ]gW`Y`9b`hk` ]W`\_`i`b[ ]b`8`Yi` hgW`U`b`X`n`Y][ hž`XUgg`X]Y  
5bnU`\`À`hYfYf`A`Yb`gW`Yb`gh`Y`h][ `ni`b]a`a`h`9]b`Yf`D`fc[ bc`gY`X`Yg  
G`h`U`h]g`h]g`W`Yb`6`i`b`X`Y`g`Ua`h`Y`g`ni`Zc`[ Y`k`]f`X`V]g`&`\$`\$`Y`X`Yf`j` ]Y`f`hY  
8`Yi` hgW`Y`Ø`V`Yf`\*)` `X`\`fY`U`h`g`Y]b``8]YgY`9b`hk` ]W`\_`i`b[ `Vf]b[ h`b`Yi`Y`

<YfUi gZcfXYfi b[ Yb'a ]h'g]W ži bhYf'UbXYfYa 'ja  
; Ygi bX\Y]hgk YgYb'i bX' ]b'XYf'gcn]U`Yb`J Yfgcf[ i b[ "  
8Ya YbhgdFYWYbX'ghY][ h'X]Y`Bchk YbX][ \_Y]h'ZØf'Dfc[ fUa a Yž'X]Y  
XUg`ÿ`hYfk YfXYb`Yf`Y]W hYfb`i bX`i bhYfghØhYb"

I a`XYb'gdYn]Y`Yb`6YXØfZb]ggYb`XYf`À`hYfYb`6Yj Ò`\_Yfi b[  
[ YfYW h'ni`k YfXYbž'g]bX`]bbcj Uhj Y`5bgÀhnY`[ YZfU[ h`J ]Y`Y`GhÀXhY  
\UVYb`VYfY]hg`VY[ cbbYbž` [ YbYfUh]cbYbZfYi bX`]WY  
⊖ZfUghfi \_hi fYb`ni`gW UZZYbž'X]Y`g]W YfghY`Ybž'XUgg`À`hYfY  
A YbgWYb`k Y]hYf\]b`U\_hj]`Ua`[ YgY`gW UZh]WYb`@YVYb  
hY]`bY\ a Yb`\_ØbbYb"⊖]h]Uhj Yb`k ]Y`VUff]YfYZfY]Y`K c\bi b[ Yb`i bX  
ØZZYbh]WY`J Yf`Y\fga ]hY`g]bX`Y]b][ Y`XYf`A U» bU\ a Ybž'X]Y`XUni  
VY]hfU[ Yb`\_ØbbYbž'X]Y`@YVYbgei U`]hÀh]a`5`hYf`ni`j YfVYggYfb"

⊖`X]YgYf`< ]bg]W h'gh'Yg`k ]W h][ ž'XUgg`J cfhfÀ[ Y`k ]Y`5`h`k YfXYb  
`Y]W hfYfÉ[ Ya UW h`b]W h`bi`f`]bZcfa ]YfYbž'gcbXYfb`Ui W`U`g  
D`UhhZcfa`ZØf`8 ]g\_i gg]cbYb`ØVYf`X]Y`bchk YbX][ Yb`J Yf`AbXYfi b[ Yb  
]b`i bgYfYf`; YgY`gW UZh`X]YbYb" Gc`k ]fX`XUg`N]Y`j YfZc`[ hž'XUgg  
À`hYf`k YfXYbXY`A YbgWYb`X]Y`i bhYfghØhni b[ `Yf`U`hYbž'X]Y`g]Y  
VYbØh][ Ybž'i a`a ]h`Ni j Yfg]W h' ]b`X]Y`Ni \_i bZh`V`]W`Yb`ni`\_ØbbYb"

8YhU]`g

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