

8 Ug' a dYf]i a 'j cb'GUa '6Ub_a Ub!: f]YX
i a ZUggh]'`]ei]XY' b] Ygh]h]cbYb']b
A]``]UfXYb\ Ò\ Y

8 Ug'; YgWÀZhg]a dYf]i a 'j cb'GUa '6Ub_a Ub!: f]YX'i a ZUggh
]'`]ei]XY'F]g]_c_Ud]hU`]bj Ygh]h]cbYb']b'A]``]UfXYb\ Ò\ Yž'k]Y
]bhYfbY'5i ZnY]W]bi b[Yb'XYf':]bUbW]U`H]a Yg'nY][Ybž'k Ug
X]Y' i b[Yk]ggY'9f\c'i b['XYf'?i bXYb'gY]bYf
ni gUa a Yb[YVfcW]YbYb': HL!6ÖfgY' i bhYfghfY]W]h"8 Yf
' \$! Å\ f][Y' i bhYfbY\ a Yfž'Y]bgh'Y]b' GhUf'XYf'? fmdhc]bXi ghf]Yž
\Uh'Ua ' : fY]hU[' : HL' b]bhYfbUh]cbU'ž'gY]bYb' i bUV\Åb[][Yb' i G!
5fa ž' i bX'gY]bY'Y][YbY' < UbXY'gZ]fa U'5`Ua YXU'F YgYUfW]`b
Y]b' [Ya Y]bgUa Yg' b]gc'j Ybnj YfZU\ fYb'j cf'XYa
6i bXYg[Yf]W]hij cb'8Y`Uk UfY' [YVfUW]h" b'XYb'YfghYb
9]bfY]W]i b[Yb'k i fXYb'gck c`'J Yfa Ò[Ybgk YfhY'U'g'Ui W
J YfV]bX']W_Y]hYb'XYf'; fi ddY'a]h'%'V]g') \$'A]``]UfXYb' i G!
8c``Uf'Ub[Y[YVYb"8 Yf'bYi Y'J cfghUbXgj cfg]hnYbXY'j cb
: HLž'æ\ b'F Umž'XYf'k Å\ fYbX'XYf'@]ei]XUh]cb'j cb'9bfc b'ni a
J cfg]hnYbXYb'YfbUbb'h'k i fXYž'gU[hYž'X]Y' i bhYfbY\ a Yb
\ÅhYb' k Yfhj c`Y / Ua d^Y``]d/

8 Ug'; YgWÀZhg]a dYf]i a 'j cb'GUa '6Ub_a Ub!: f]YX'i a ZUggh
]'`]ei]XY'F]g]_c_Ud]hU`]bj Ygh]h]cbYb']b'A]``]UfXYb\ Ò\ Yž'k]Y
]bhYfbY'5i ZnY]W]bi b[Yb'XYf':]bUbW]U`H]a Yg'nY][Ybž'k Ug
X]Y' i b[Yk]ggY'9f\c'i b['XYf'?i bXYb'gY]bYf'ni gUa a Yb[YVfcW]YbYb': HL!6ÖfgY
i bhYfghfY]W]h"

8 Yf' \$! Å\ f][Y' i bhYfbY\ a Yfž'Y]bgh'Y]b' GhUf'XYf'? fmdhc]bXi ghf]Yž
\Uh'Ua ' : fY]hU[' : HL' b]bhYfbUh]cbU'ž'gY]bYb' i bUV\Åb[][Yb' i G!
5fa ž' i bX'gY]bY'Y][YbY' < UbXY'gZ]fa U'5`Ua YXU'F YgYUfW]`b Y]b
[Ya Y]bgUa Yg' b]gc'j Ybnj YfZU\ fYb'j cf'XYa '6i bXYg[Yf]W]hij cb
8Y`Uk UfY' [YVfUW]h"

⊕`XYb`YfghYb`9]bfY]Wxi b[Yb`k i fXYb`gck c`J Yfa Ò[Ybgk YfhY`U`g
Ui W`J YfV]bX`]W_X]hYb`XYf`; fi ddY`a]h`\$`V]g`) \$`A]`]UfXYb`I G!
8c`Uf`Ub[Y[YVYb``8Yf`bYi Y`J cfghUbXgj c f g]hnYbXY`j cb` : HL ž`æ`
F Umž`XYf`k À`fYbX`XYf`@]ei]XUh]cb`j cb`9bfc b`ni a`J c f g]hnYbXYb
YfbUbbh`k i fXYž`gU[hYž`X]Y`I bhYfbY`a Yb`À`hYb` k Yfhj c`Y
J Yfa Ò[Ybgk YfhY` i bX`XYf`?cb`_i fg`k ØfXY`X]Y`F ØW_ZØggY
a UI]a]YfYb"

8 Ug`k Y]h`Ài Z[Y`F]g]_c`_Ud]hU`dcfhZc`]c`k]fX`X]Y`?ca`d`YI]h`h`XYg
⊕gc`j Ybnj YfZU`fYbg`Yf`À`Ybž`XUg`gY`Vgh`a Y`f`U`g`%` \$`j cb
6Ub`_a Ub!: f]YX`_cbhfc``]YfhY`I bhYfbY`a Yb`i a ZUggh``8Yf
Ni gUa`a YbVfi W`j cb` : HL`[Y`À`fh`ni`XYb`XfUa`Uh]gW`ghYb
A]ggYfZc`[Yb`]b`XYf`?fmdhc]bXi ghf]Yž`b]W`h`bi`f`]b`X]YgYa`⊕`fž
gcbXYfb`gY]h`XYf`GW`UZI b[]cb`6]hWc]b`j cf`a Y`f`U`g`Y]bYa
⊕`fnY`bh"

: HL`i bX`gY]bY`j YfVi bXYbYb`I bhYfbY`a Yb`UVYb`XYb`[YbUi Yb
I a ZUb[]`fYf`J YfV]bX`]W_X]hYb`i bX`J Yfa Ò[Ybgk YfhY`gck]Y`XYb
k U`fgW`Y]b`]W`VYghY`YbXYb` : Y`VYhfU[`bcW`b]W`h`VY`Ubbh
[Y[YVYb``8Yf`_Øfn`]W`j Yfghc fVYbY`@Y]hYf`XYg`]bgh]hi`h]cbY`Yb
J Yfhf]YVg`j cb` : HL ž`NUbY`HUW`Yhž`gU[hY`Ua` : fY]hU[`Ui Z`Hk]hYfž
XUgg`g]W`XYf` : Y`VYhfU[`Ui Z`A]`]UfXYb`j cb`8c`Uf`VY`Ui ZY`` : HL
fYU[]YfhY`b]W`h`gcZc`fh`Ui ZY]bY`6]hY`i a`GhY`i b[bU`a`Y"

⊕XY`@ØW`Y`nk]gW`Yb`J Yfa Ò[Ybgk YfhYb`i bX`J YfV]bX`]W_X]hYb
k]fX`Xi fW`XYb`K Yfh`VYY]bZi gghž`XYf`Ui`g`ZUgh`) ž(`A]`]UfXYb`I G!
8c`Uf`ni fØW`[Yk cbbYb`k YfXYb`_Ubbž`X]Y` : HL`i bX`5`Ua`YXU`]b
ZUgh`) \$\$`?fmdhci bhYfbY`a Yb`i bX`F]g]_c`_Ud]hU`Zc`bXg`]bj Ygh]Yfh
UVYbž`k]Y`Ui`g`XYb`5i ZnY]W`bi b[Yb`XYf` : H`Yfj`cf[Y`h"

8]Y`[fÒ» hY`X]YgYf`⊕j Ygh]h]cbYb`g]bX`%ž%) `A]`]UfXYb`I G!8c`Ufž
X]Y`5`Ua`YXU`nk]gW`Yb`5i [i gh`&\$&%`i bX`5df]`&\$&&]b`X]Y`?fmdhc!
A]b]b[!; fi ddY` ; YbYg]g`8][]hU`5ggYhg[YghYW`h`Už`k]Y`X]Y
5i ZnY]W`bi b[Yb`nY][Yb"

2 ZYb`h]W`i [Y`UbXY`hY`6Yf[VUi`i bhYfbY`a Yb`UVYb`]a
j Yf[Ub[YbYb`⊕`f`ghUf`_`UVj Yf`_Ui Zhž`XU`XYf`?fmdhca`Uf`h
ni fØW`[Y[Ub[Yb`]gh``8Yf`?fmdhc!A]b]b[!⊕XYI`< Ug`F UhYž`XYf

gc`WXY`5_hjYb`UVVj`XYhž`]ghigY]h`5i [i gh`&\$&%`i a `+) `DfcnYbh
[YZU`Yb"; YbYg]g`Ubhk`cfhYhY`b]W`h`gcZc`fh`Ui`ZY]bY`6]hY`i`a
GhY`i`b[bU\`a`Y"

8]Y`5i`ZnY]W`bi`b[Yb`]]ghYb`Ui`W`a`Y`f`U`g`%`A`j`]UfXY`i`G!8c`Uf
Ui`Z`X]Y`]b`Y`hk`U`(`\$`:`cbXg`]bj`Ygh]Y`fh`k`i`fXYbž`X]Y`j`cb
F]g]_c`_Ud]hU`Z]fa`Yb`VYhf]YVYb`k`YfXYbž`XUfi`bhYf`Y]b][`Yž`X]Y
`b]`Yghc`fYb`]b`:`HL`k`UfYbž`k`]Y`GYei`c]U`7Ud]hU`"Ni`X]YgYb
6YhY][`i`b[Yb`[Y\`Öfh`Y]bY`" \$\$!A`j`]cbYb!8c`Uf!`b]`Ygh]h]cb`j`cb
5`Ua`YXU`]b`?)`:`cVU`ž`X]Y`j`cb`A`]W`UY`"?`j]`Yg`[YZØ`fhY`:]fa`U`"8]Y
`b]`Ygh]h]cb`VY`Äi`Zhig]W`Ui`Z`"\$`DfcnYbh`XYf`:`YbYfU`DUf`hbYfg`]\d
j`cb`?)`ž`i`bX`&&) `A`j`]cbYb`i`G!8c`Uf`XYf`:`YgUa`hgi`a`a`Y`VYZ]bXYb
g]W`i`Ui`h`5i`ZnY]W`bi`b[Yb`]b`9`cb`A`i`g_g`GdUW`L`UbX`6cf]b[
7ca`dUbmi`bX`UbXYfYb`b]W`h`i]XYbh]Z]n]YfhYb`i`bhYfbY\`a`Yb"

5bZUb[`X]YgYg`&]\fYg`nY][`hYb`HYI`hYž`X]Y`k`À`fYbX`A`i`g_g
F`Y`W`hggh`fY]h`a`]h`Hk`]hYf`j`YfÖZZ`b`h`]W`h`k`i`fXYbž`XUgg`?`j]`Yg
6Ub_a`Ub!:`f]YX`U`g`7c!`b]`Yghc`f`]b`XUg`GcW]U`!A`YX]U!`i`bhYfbY\`a`Yb
j`c`fgW`i`["`A`i`g_k`Uf`[Y[YbØVYf`XYa`:`HL!`:`fØbXYf`UVk`Y]gYbX
i`bX`bU\`a`g`W`i]Y`»`]W`i`:`Y`X`j`ca``@Y]hYf`XYf`_cb`_i`ff]YfYbXYb`6ÖfgY
6]bUbW`ž`7\`Ub[dYb[`N\`Uc"

5bXYfY`[fc»`Y`K`Y`hYbž`X]Y`]b`XYb`5i`ZnY]W`bi`b[Yb`Ui`Z[YZØ`fh
g]bXž`i`a`ZUggYb`Y]bY`)`\$\$!A`j`]cbYb!8c`Uf!`b]`Ygh]h]cb`]b
5bh\`fcd]Wž`Y]b`G]W`Yf\`Y]hg!`i`bX`:`c`fgW`i`b[gi`bhYfbY\`a`Yb`ZØf
_Øbgh]W`Y`b`hY`][`Ybnž`XUg`5bZUb[`X]YgYg`&]\fYg`j`cb`6Ub_a`Ub!
:`f]YX`ØVYf`5`Ua`YXU`[Yh`Äh][`h`k`i`fXY`"5bh\`fcd]WfYU[]YfhY`b]W`h
gcZc`fh`Ui`ZY]bY`6]hY`i`a`GhY`i`b[bU\`a`Y"

E i Y`Y.`:]bUbW]U`H]a`Yg

6Ygi WXYb'GjY'i bg'Ui Z' _fmdhc!bYk g"Uh