

9b [Y `? fmdhc!A Uf_hgd UbbY `U`g _ca df]a]YfhYf': fØ\`]b [

8Yf? fmdhca Uf_h`V`Y]Vh`b`XYf`GWk YVY`i bX`[`Y]Wk h
[`Y]WknY]h[`Y]bYf`_ca df]a]YfhYb': YXYf" k]fX`Ua
8]YbghU[a cf[Yb`_bUdd`i bhYf` (*"\$\$\$`I G8`[Y\UbXY`h`i bX
VYYbXYh`XUa]h`XYb`gW`YddYbXYb`FØW_[Ub[`XYf`YhnhYb
gYWg`HU[Y" `GhfYb[`[Ybca a Yb`g]Y\h`XYf
? fmdhc k Å\fi b[ga Uf_h`b]Wk h`ØVYfj Yf_Ui Zh`Ui gž`i a `ZØf`_i fn!
i bX`a]hhY`Zf]gh[Y`? Åi ZY`Y]bXYi h[`UhhfU_h]j `ni `gY]bž`nY][h
UVYf`5bnY]Wk Yb`j cb`? Åi ZYf]bhYfYggY" ;]Yf!`i bX`5b[gh]bXYI
XYg`? fmdhca Uf_hYg.`b]YXf][ž`UVYf`b]Wk h`ØVYfj Yf_Ui Zh`8Yf
? fmdhc k Å\fi b[g!; fYXX`UbX` : YUf!`ϕXYI `]gh`Ui ZX]Y" \$
[YZU`Ybž`X\ / Ua d/ , &&&/ YUf/ Ua d/ , &&\$/" J cb`X]YgYb
B]j YUi g`Ui g`ghUfhYhY`XYf`ϕXYI `]a `A U]`]b`X]Y`U_h]j ghY
5i gj Yf_Ui Zgd\UgY`XYg`? fmdhca Uf_hYg" <]ghcf]gWk `[YgY\Yb
k Uf`XYf`? Ui Zj cb`? fmdhc k Å\fi b[Yb`Ua `UhhfU_h]j ghYbž`U`g
XYf`ϕXYI / Ua d^Y``]d/

8Yf? fmdhca Uf_h`V`Y]Vh`b`XYf`GWk YVY`i bX`[`Y]Wk h[`Y]WknY]h[
Y]bYf`_ca df]a]YfhYb': YXYf" k]fX`Ua `8]YbghU[a cf[Yb`_bUdd
i bhYf` (*"\$\$\$`I G8`[Y\UbXY`h`i bX`VYYbXYh`XUa]h`XYb
gW`YddYbXYb`FØW_[Ub[`XYf`YhnhYb`gYWg`HU[Y"

GhfYb[`[Ybca a Yb`g]Y\h`XYf`? fmdhc k Å\fi b[ga Uf_h`b]Wk h
ØVYfj Yf_Ui Zh`Ui gž`i a `ZØf`_i fn!`i bX`a]hhY`Zf]gh[Y`? Åi ZY`Y]bXYi h[
UhhfU_h]j `ni `gY]bž`nY][h`UVYf`5bnY]Wk Yb`j cb`? Åi ZYf]bhYfYggY"

;]Yf!`i bX`5b[gh]bXYI`XYg`? fmdhca Uf_hYg.`b]YXf][žUVYf`b]W\h
ØVYfj Yf_Ui Zh

8 Yf`? fmdhck Å\fi b[g!; fYXX`UbX` : YUf! ðXYI`]gh`Ui ZX]Y` ` \$
[YZU``Ybž`X\` : YUf "J cb`X]YgYb`B]j YUi g`Ui g`ghUfhYhY`XYf` ðXYI
]a`A U]`]b`X]Y`U_h]j ghY`5i gj Yf_Ui Zgd\UgY`XYg`? fmdhca Uf_hYg"
<]ghcf]gW\ [YgY\Yb`k Uf`XYf`?Ui Zj cb`? fmdhck Å\fi b[Yb`Ua
UhhfU_h]j ghYbž`U`g`XYf` ðXYI` j cb`Yhk U`%\$`Ui ZY]bYb`5bgh]Y [
i a`_Y\fhY`fba`]h`YI hfYa Yf`5b[ghL`

J c fg]W\h]gh`YXcW\`bcW\`_Y]bY`YbhgW\Y]XYbXY`9][YbgW\UZh`ZØf
? fmdhc! ðj YghcfYb``6]hW\]b`\Uh`X]YgYb`A cbUh`a Yh\cX]gW\`Ub
l bhYfghØhni b[`Ui Z`XYf`l bhYfgY]hY`Y]bYg`Y]bZUW\Yb`[`Y]hYbXYb
&\$!HU[Y!8i fW\gW\ b]hng`[Yk cbbYbž`XYf`Ymh`bU\Y` (` \$ \$`I G8
`Y[h``5bZUb[`5i [i gh`\Uh`XYf`5bgh]Y[`X]YgYf`?i fj Y`]b`XYb
bÅW\ghYb`ZØbZK cW\Yb`Y]bYb`5bgh]Y[`j cb` (\$i` `Ui g[Y`Øgh"

6H7I G8`Z]bXYh'k Y]hYf\]b`i bhYfghØhni b[`VY]a `F ØW_[Ub[`]b
F]W\hi b[`XYg`&\$!HU[Y!A 5

8]Y`8mbUa]_`XYg[Yghf][Yb`HU[Yg`nY][hž`k]Y`gW\ bY``i bX`ghUf_
X]Y`6Yk Y[i b[`VY][`fc»Yb`B UW\ f]W\hYb`gY]b`_Ubb"

; YghYfb`Yf`YVhY`@]hYW\]b`Y]bYb`A ca YbhXYf`9i d\cf]Yž`XYggYb
Bch]Yfi b[Yb`i a `Y]b`8f]hY``Ui Z`&') `I G!8c``Uf`gh]Y[Ybž`U`g`X]Y
B UW\ f]W\h`VY`_Ubb`h`k i fXYž`XUgg`K U`a Ufh`fB MG9.Ł`XUg`U`nYdh]YfYb
k ØfXY`W\]b`U`g`NU\`i b["8]Y`B UW\ f]W\hYb`k i fXYb`[YZÀ`gW\h`i bX
X]Y`W\]b`_Y\fhY`gW\ bY``Ui ZXUg`j cf\Yf][Y`B]j YUi `bU\Y`%+` `I G8
ni fØW_`"8]Y`dcg]h]j Y`8mbUa]_`]a `W\]b`9fk Å\bYbgk Yfh`]ghž`XUgg`]b
XYf`YhnhYb`K cW\Y`ghYh][`?Ui Z bhYfghØhni b[`VY]`9]bVfØW\Yb
i bhYf`%+\$`I G8`[YZ bXYb`k i fXYž`X]Y`nk]gW\Yb`XYb`[`Y]hYbXYb
) \$!`i bX`&\$!HU[Y!8i fW\gW\ b]hYb`ghYW_Yb[YV`]YVYb`g]bX"

@H7`ghYW_hY`nk]gW\Yb`XYb`[`Y]hYbXYb`) \$!`i bX`&\$!HU[Y!
8i fW\gW\ b]hYb`ZYgh

⇒`XYb`YhnhYb`HU[Yb`gU\Yb`5`hW\]bg`]a `5``[Ya Y]bYb`gW\k ÅW\Yf
Ui g`U`g`6]hW\]bž`k cXi fW\`YhnhYfY`Y]bYb`HY]`]\fYg`j Yf`cfYbYb

6cXYbg]b`XYf[YgUa hYb`? fmdhc!A Uf_h_Ud]hU`]g]Yfi b[
k]YXYf[Yk]bbYb`_cbbhYb" `l bX`XUg`]gh`_Y]b`gc`gW`YW`hYg
NY]W`Ybž`XYbb`6]hWc]b`]gh`cZh`XYf`YfghYž`XYf`Y]bY`HfYbXk YbXY
g]Y`h" `8 Ug`J`c f`U`b`XYbgY]b`ghYh][Yf`?`Ai`ZY`]b`XYb`_ca`a`YbXYb
HU[Yb`k]fX`Yg`XYb`A`Af`_hYb`Yfa`Ö[`]W`Ybž`X]Y`dYgg]a`]gh]gW`Yb
9fk Ufhi b[Yb`XYg`? fmdhca Uf_hYg`UVni`gW`ØhhY`b`i`bX`X]Y`dcg]h]j`Y
DfY]gXmbUa`_]`ba`]hhYb`Y]bYf`Ub`U`hYbXYb`:`Ui`hY`bUW`XYa
5VgW`k`i`b[`k`]YXYfni`VY`YVYb"

8 Ug`:`l`Dfc!5bU`mghYb`hYUa

°Zi`bWh]cbfZV`žY`ž`žb`žžgk`o]ZfZ`ZVe`lfYhi`fb`/b1`Z`ZVe1`Zi`bWh]cbfk
ob"WU`A`Yh`cX3
b"WU`A`Yh`cX"Udd`mf`bžUf[i`a`Ybhgk`b"ei`Yi`Y"di`g`fUf[i`a`Ybhgkq/
]Zf`Z`SZVe`kZ`SZVe1`b`/b"di`g`1`b`/b" `c`UXYX1`°`\$`/b"j`Yfg]cb1`f&"\$f/
b"ei`Yi`Y1`Q`h1`V"WfYU`hY9`Ya`YbhfY`L`h"UgmbW`°`\$/
h"gfW`j`/g1`V"[Yh9`Ya`Ybhg6`mHU[B`Ua`YfY`kQ\$Q
g"dUfYb`hB`cXY"]bgYf`h6Y`Zc`fY`fhžgkqfk`]bXck`ž`XcW`a`YbhžgWf]d`hfž
f`h`hdg`##`Wc`bbYW`"ZUW`Vcc`_"bYh`#Y`bSI`G`#ZVYj`Ybhg" `g`fL`/`ZVe`ff]b]hfž
f+`)%%%\$` ,`%*`(`&` ,`fL`/`ZVe`ff`fUW`_fz`fDU[YJ]Yk`fL`/`

8YhU]`g

6Ygi`W`Yb`G]Y`i`bg`Ui`Z.`_fmdhc!bYk`g"Uh