

I bZU``]b' < UXUa Uf. ': U\ffUXZU\ fYf`VY] Ni gUa a Ybghc» ``Y]W\h`j Yf`Yhnh

B UW\`Y]bYa `I bZU``]b' < UXUa Uf`k]fX`X]Y`5i hcZU\ fYf]b
[Ygi W\h`X]Y`Y]bYb`F UXZU\ fYf`ni a `Ghi fn`VfUW\hY`" <]bk Y]gY
Ub`X]Y`Dc`]nY]"

ϕ' < UXUa Uf`_Ua `Yg`Ua `GUa ghU[UVYbX`ni `Y]bYa
VYa Yf`Ybgk YfhYb`J Yf`Y\fgi bZU``ž`XYf`b]W\h`bi f`Y]bYb`j Yf`YhnhYb
F UXZU\ fYf`ni f` : c`[Y`\UhYž`gcbXYfb`Ui W\`X]Y`² ZYb`h]W\`Y]h`Ui Z
XYb`Ni ghUbX`XYg`J Yf`Y\fgg]W\Yf`Y]hgVYk i gghgY]bg`Ui Za Yf`gUa
a UW\h`"I a`%-`" \$`I`\f`Z`\f`Y]b`(`!`Å\f][Yf`A Ubb`Ui Z`gY]bYa
: U\ffUX`X]Y`?]fW\ [UggY`Yb`h`Ub[ž`U`g`Y]bY`5i hcZU\ fYf]b`]b
Yb`h[Y[Yb[YgYhnhYf`F]W\hi b[`Ui Z`\b`ni _Ua ``8]Y`I bVY`Ubb`hY`k Uf
a]h]\fYa `D_k`i bhYfk Y[g`i bX`][bcf]YfhY`cZZYbVUf`XUg`[Y`hYbXY
F YW\hgZU\ f[YVch"

5`g`XUg` : U\fnYi [`]b`XYf`B`Å\Y`XYf`@]YVZfUi Yb_]fW\Y`XYb
: i » [Åb[YfØVYfk Y[`dUgg]YfhYž`k Uf`XYf`F UXZU\ fYf`[Ynk i b[Ybž
Ui gni k Y]W\Ybž`i a `Y]bY`?c``]g]cb`ni `j Yfa Y]XYb``@]XYf`ZØ\fhY
X]YgY`d`Øh`]W\Y`6Yk Y[i b[`ni `Y]bYa `Ghi fnž`k cXi fW\`g]W\`XYf
F UXZU\ fYf`Y]W\h`j Yf`YhnhY`"9g`]gh`k]W\h][`ni `VYhcbYbž`XUgg`Yg
XUVY]ni `Y]bYf`X]fY`_hYb`6YfØ\fi b[`nk]gW\Yb`XYa `D_k`i bX`XYa
: U\ffUX`_Ua ``8YbbcW\`ghY``hY`X]YgYf`J cfZU``Y]b`XYi h]W\Yg`F]g]_c
ZØf`XYb`F UXZU\ fYf`XUf`i bX`k]fZi: fU[Yb`ni f`5i Za Yf`gUa _Y]h`i bX
F ØW_g]W\hbU\ a Y`]a `GhfU» Ybj Yf`Y\`f`Ui Z"

I bVY`Ub`b`hY`5i hcZU\ fYf]b` `Äggh`F UXZU\ fYf]a `Gh]W\

B UW\`XYa `Ghi fn`\]Y`h`X]Y`5i hcZU\ fYf]b`nk Uf`Ub`i bX`gh]Y[`Ui g
\fYa `: U\fnYi [ž`YXcW\`nY][hY`g]Y`k Yb][`ϕ`hYfYggY`Ua

K c\`Yf[Y\Yb`XYg`j Yf`YhnhYb`A UbbYg"NYi [YbVYf]W hYb`ni Zc`[Y
Yf_i bX][hY`g]Y`g]W`b]W`h`bUW`gY]bYf"; Ygi bX\Y]hi bX`[UV`]\fY
DYfgcbU`Yb`b]W`h`Ubb`VYj cf`g]Y`k]YXYf`]b`]\f`5i hc`ghY[`i bX`]b
F]W`hi b[`]gh`b]W`h`bi f`ZU\`f`Àgg][ž`gcbXYfb`j YfghØ» h`Ui W`[Y[Yb`X]Y
[YgYh`]W`Yb`J YfdZ]W`hi b[Yb`bUW`Y]bYa`J Yf_Y\fgi bZU`"

8Yf`(' !>À\`f][Y`Yf\]Y`h`gW`bY`<`]ZY`Xi fW`Y]bYb`FYhhi b[gk U[Ybž
XYf`j cf`C fh`Y]bhfUZ`Hfc`m`XYf`Y]W`h`Yb`J Yf`Ymi b[Ybž`X]Y`Yf
Yf`]hYb`\UhhYž`Y\`bhY`Yf`Y]bY`k Y]hYfY`a`YX]n]b]gW`Y`6Y\U`bX`i b[
UV`"6Y]`XYf`l`bhYfgi W`i b[`VYa Yf`hYb`X]Y`FYhhi b[g_f`ÀZhY`YXcW`
Y]bYb`XYi h]W`Yb`5hYa U`_c\`c`[Yfi W`ž`XYf`Ui ZY]bYb`Yf\YV`]W`Yb
5`_c\`c`_cbgi a` \]bk]Yg`"9]b`žFY]k]`][`Xi fW`[YZØ\`fhYf
5hYa U`_c\`c`hYgh`Yf[UV`Y]bYb`U`Ufa`]YfYbXYb`K`Yfh]j`cb`%ž-)
Dfca`j`Y`"8]YgYf`K`Yfh`]ghØVYf`XYa`[YgYh`]W`Yf`Ui VhYb`@]a`]h`ZØf
XUg`: U\`fYb`Y]bYg`: U\`fnYi [gž`k Ug`X]Y`G]hi Uh]cb`VYgcbXYfg`Yfbgh
YfgW`Y]bYb`Àggh"

8]Y`Dc`nY]`@]a`Vi f[`U`h`X]Y`9fa`]hhi b[Yb`ni`X]YgYa`J`cfZU`
Ui Z[Ybca`a`Yb`"9g`k`YfXYb`NYi [Yb`[Ygi W`hž`X]Y`<]bk`Y]gY`ni`f
ϕYb]h]h`h`XYf`5i`hcZU\`fYf]b`cXYf`ni`a`l`bZU`UV`Ui`Z[YVYb`_`ØbbYb`
8]Y`6Y\`ØfXYb`UddY`Y]YfYb`Ub`X]Y`2`ZYbh]W`_Y]hž`X]Y`Dc`nY]`i`bhYf
XYf`HY`Y`Zcbbi`a`a`Yf`\$*(`%`-`%(`\$\$`ni`_`cbhU`_h]YfYbž`ZU`g`Y`a`UbX
ϕZcfa`Uh]cbYb`\`Uh"

J YfghØ» Y`[Y[Yb`J Yf_Y\fgfY[Y`b`i`bX`] \fY : c`[Yb

8Yf`: U`Y`Vh`X]Y`_f]h]gW`Y`DfcV`Ya`Uh]_`XYg`: U\`fYbg`i`bhYf
5`_c\`c`Y]bZi`gg`\`Yfj`cf`"5`_c\`c`Ua`GhYi`Yf`]gh`Y]bY`XYf
<Ui`dhi`fgUW`Yb`ZØf`J`Yf_Y\fgi`bZ`Y`i`bX`[YZ\`fXYh`b]W`h`bi`f`XYb
: U\`fYf`gY`Vghž`gcbXYfb`Ui`W`UbXYfY`J`Yf_Y\fghY]`bY`a`Yf`"8]Yg
i`bhYfghfY]W`h`X]Y`K`]W`h][`_Y]h]j`cb`5i`Z`Àfi`b[`i`bX`Df`Aj`Yb]cb`]b
6Yni`[`Ui`Z`5`_c\`c`i`bX`: U\`fYb`"8]Y`HUhgUW`Yž`XUgg`XYf`F`UXZU\`fYf
nk`Uf`j`Yf`Yhnhž`UVYf`XYb`bcW`b]W`h`gW`k`YfYf`j`Yf`Yhnh`k`i`fXYž`]gh
Y]b`;`ØW`_gZU`"5`YfX]b[g`\`ÀhY`X]Y`G]hi`Uh]cb`k`Y]hUi`g`gW`]a`a`YfY
?`cbgYei`YbnYb`bUW`g]W`n]Y\`Yb`_`ØbbYbž`VYgcbXYfg`k`Ybb`Yg`ni
Y]bYf`Ni`gUa`a`YbghØ» Y`[Y`_ca`a`Yb`k`ÀfY"

8]Y`J Yf_Y\fgg]W\Yf\Y]h]gh'gca]h`Y]b`H\Ya U`j cb`Yf\YV`]W\Ya
ÖZYbh]W\Yb`ϕhYfYggY""8]Y`6Y\ÖfXYb`a ØggYb`k Y]hYf\]b`Ui ZX]Y
9]b\U`hi b[`j cb`J Yf_Y\fgfY[Y`b`\]bk]f_Ybž`i bX`Yg`]gh
i bYf`Àgg`]W\ž`XUgg`X]Y`6Yj Ö`_Yfi b[`ØVYf`X]Y` ; YZU\fYb`XYg
5`_c\c`_cbgi a g`VY]a ` : U\fYb`]bZcfa]Yfh`V`Y]Vh""8Yf`J cfZU``]b
<UXUa Uf`nY][hž`k]Y`k]W\h][`Yg`]ghž`Ui Za Yf_gUa `]a
GhfU» Ybj Yf_Y\f`ni `gY]b` `gY]Yg`U`g`5i hcZU\fYf`cXYf`U`g
F UXZU\fYf"

8]Y`Dc`]nY]`@]a Vi f[`gYhnh]g]W\`U_hj] `ZØf`X]Y`G]W\Yf\Y]h]a
GhfU» Ybj Yf_Y\f`Y]b""9]b`<]bk Y]g`Ui ZX]Y`K]W\h][`_Y]h]j cb
j YfUbhk cfhi b[gj c``Ya `J Yf\U`hYb`]a `J Yf_Y\f`V`Y]Vh`Y]b`nYbhfU`Yf
5gdY_hž`i a `XYfUfh][Yb`J cfZÀ`Yb`]b`XYf`Ni _i bZ]j cfni VYi [Yb"

J Yf_Y\fgi bZÀ`Y`i bX`] \fY`5i gk]f_i b[Yb`]b
8 Yi hgW\`UbX

J Yf_Y\fgi bZÀ`Y`g]bX`Y]bY`k Y]h]j YfVfY]hYhY`DfcV`Ya Uh]_`]b
8 Yi hgW\`UbX""@]i h`XYf`GhUh]gh]gW\Yb`6i bXYgUa h`\UVYb`]a
ϕ\f`&\$&&]bg[YgUa h`fi bX`&ž` `A]``]cbYb`J Yf_Y\fgi bZÀ`Y`
ghUhh[YZi bXYb""8]YgY`NU\`i a ZUggh'gck c`\`gW\k YfY`U`g`Ui W\
`Y]W\hY`J Yf`Yhni b[Yb`/`YXcW\`g]bX`X]Y`5bnU\`XYf`hÖX`]W\Yb
I bZÀ`Y`]b`XYb`YhnhYb`ϕ\fYb`hYbXYbn]Y``ni fØW_[Y[Ub[Yb"
8Yb`bcW\`V`Y]Vh`X]Y`I bZU`fUhY`]b`ghÀXh]gW\Yb` ; YV]YhYbž`k]Y`ni a
6Y]gd]Y``<UXUa Ufž`\cW\ž`k Ug`Ui ZX]Y`ni bY\`a YbXY
J Yf_Y\fgX]W\hY`i bX`cZi`Ui W\`Ui Zi bUi Za Yf_gUa Y` : U\fk Y]gY
ni fØW_ni ZØ\fYb`]gh"

9]b`5gdY_hž`XYf`cZi`ØVYfgY\Yb`k]fXž`]gh`X]Y`dgmW\c`c[]gW\Y
K]f_i b[`gc`W\Yf`I bZÀ`Y`Ui ZX]Y`6YhY]][hYb""9]b`I bZU`ž`gY`Vgh
k Ybb`Yf`Y]W\h]ghž`_Ubb`ni ``Àb[YfZf]gh][Yb`dgmW\]gW\Yb
6Y`Ughi b[Yb`ZØ\fYbž`k]Y`Yhk U`5b[ghni ghÀbXYb`cXYf`DHG8""8Yf
VYhfcZYbY`F UXZU\fYf`k]fX`]a `BUW\ [Ub[`XYg`J cfZU`g
a Ö[`]W\Yfk Y]gY`Ui W\`j cb`Y]bYa `Yf\Ö\hYb
G]W\Yf\Y]hgVYk i gghgY]b`VYhfcZYb`gY]bž`k Ug`g]W\`Ui ZgY]b
: U\fj Yf\U`hYb`Ui gk]f_Yb`_ÖbbhY"

8]Y`6YXYi hi b[`j cb`J Yf_Y`f`gg]W\ Yf`Y]h`i bX
5i Z`Àfi b[

⇒`8Yi hgW`UbX`Y]Y[h`Y]b`[fc»Yf`c`_i g`Ui Z`J Yf_Y`f`gg]W\ Yf`Y]h`i bX
DfAj Ybh]cb`"⇒`h]Uhj] Yb`XYf`8Yi hgW`Yb`J Yf_Y`f`gk UW`h`V]YhYb
Dfc[fUa`a`Y`ni`f`GYbg]V`]g]Yfi b[`j cb`5i hcZU`fYfb`i bX
FUXZU`fYfb`ž`i`a`gc`W`Y`l`bZ`Y`ni`j`Yfa`]bXYfb`"9g[]Vh`gd`Yn]Y`Y
GW`i`i`b[gdfc[fUa`a`Y`Z0f`5i hcZU`fYf`ž`i`a`J Yf_Y`f`gg]W\ Yf`Y]h`i
Z0fXYfb`i bX`XUg`6Yk`i`gghgY]b`Z0f`X]Y`F]g]_Yb`]a`GhfU»Ybj Yf_Y`f`
ni`gW`ÀfZYb`"; YfUXY`]b`Gh`X`hYb`]gh`Y]bY`j`Yfgh`Àf`hY`5i Z`Àfi b[
ØVYf`XUg`f]W`h][Y`J Yf`U`hYb`]a`l`a`[Ub[`a`]h`FUXZU`fYfb`]cb
[fc»Yf`6YXYi hi b["

⇒`XYf`U`_hi`Y`Yb`G]hi`Uh]cb`ž`]b`XYf`XYf`l`bZU`j`Yfi`fgUW`Yf`b]W`h`X]Y
b`chk`YbX][Yb`<UbX`i`b[Yb`i`bhYfbU`a`ž`i`a`XYa`j`Yf`YhnhYb
FUXZU`fYf`ni`Y`ZYb`ž`k`]fX`_`Uf`ž`k`]Y`k`]W`h][`XUg`9]b`U`hYb`XYf
DZ]W`hYb`bUW`Y]bYa`J Yf_Y`f`gi`bZU`j]gh`8Ug`B]W`h!5b[UVYb`XYf
DYfgcbU`]Yb`i`bX`XUg`J Yf`UggYb`XYg`l`bZU`c`fhYg`_0bbYb`fYW`h]W`Y
?cbgYei YbnYb`bUW`g]W`n]Y`Yb`i`bX`ghY`h`Y]bYb`_`UfYb`J Yfghc»
[Y[Yb`XUg`XYi hgW`Y`GhfU»Ybj Yf_Y`f`fgfYW`h`XUf"

8]Y`F`c`Y`XYg`5`_`c`c`hY`ghg`i`bX`X]Y
[YgYhn`]W`Yb`?`cbgYei`YbnYb

⇒`Yfk`À`bhYb`J`cfZU`k`i`fXY`VY]a`i`U`ffUXZU`fYf`Y]b
5hYa`U`_c`c`k`Yfh]`cb`%ž`-`Dfca`j`Y`ZYgh[YghY`h`8]Yg`]Y[h
XYi`h]W`ØVYf`XYf`[YgYhn`]W`Yb`; fYbnY`Z0f`XUg`i`U`fYb`Y]bYg
: U`fnYi`[gž`k`Y`W`Y`VY]`\$ž`Dfca`j`Y`]Y[h`6Y]`K`YfhYb`ØVYf`%ž`%
Dfca`j`Y`k`]fX`]b`8Yi hgW`UbX`gc[Uf`X]Y`i`U`fY][bi`b[`j`cb`XYf
Dc`]nY]i`bX`UbXYfYb`⇒`gh]hi`h]cbYb`Ub[Ynk`Y]ZY`hž`k`Ug`ghfYb[Y
fYW`h]W`Y`i`c`[Yb`U`UVYb`_Ubb"

8Yf`J`cfZU`i`bhYfghfY]W`h`X]Y`; YZU`fYb`XYg`i`U`fYbg`i`bhYf
5`_c`c`Y]bZi`ggž`gck`c`Z0f`XYb`i`U`fYf`U`g`Ui`W`Z0f`UbXYfY
J Yf_Y`f`ghY`]bY`a`Yf`8]Y`i`c`[Yb`_0bbYb`]cb`GhfU`ZnU`i`b[Yb`ØVYf
: U`fj`YfV`ch`V]g`l`]b`ni`<U`ZghfUZ`Yb`fY]W`Yb`"8]Y`6Y`ØfXYb`bY`a`Yb
gc`W`Y`J`Yfgh`Ø`Y`Yfbghž`i`bX`⇒`h]Uhj] Yb`ni`f`GYbg]V`]g]Yfi b[`XYf

6Yj Ò`_Yfi b[`ØVYf`X]Y`F]g]_Yb`XYg`5`_c`c`_cbgi a g]a
GhfU» Ybj Yf_Y`f`f`UVYb`]b`XYb`YhnhYb`U`fYb`ni [Ybca a Yb"
A U» bU`a Yb`k]Y`X]Y`5_h]c b` G]W`Xf`Xi fW`XYb
GhfU» Ybj Yf_Y`f`f`n]Y`Yb`XUfUi Z`UVž`XUg`6Yk i gghgY]b`ZØf
j YfUbhk cfhi b[gj c`Yg`J Yf`U`hYb`ni`gW`ÅfZYb"

8YhU]`g

6Ygi W`X Yb`G]Y`i bg`Ui Z.`X]Y!b UW`f]W`hYb`"bYh