

6i bXYg`][U!GU]gcbghUfh. : fY]Vi f[
ØVYffUgWk h`Ghi hh[Ufh`a]h` .%!G]Y[

Ghi hh[Ufh`Yf`Y]XYh`VY]a`GU]gcbghUfh]b` : fY]Vi f[`Y]bY
%.' !B]YXYf`U[Y`"8Yf`J Z6`nY][h`gWk UWY`@Y]ghi b[`i bX`Uh
[fc»Yg`J Yf`Yhni b[gdYWk "

8Yf`GhUfh]b`X]Y`bYi Y`6i bXYg`][U!GU]gcb`k Uf`ZØf`X]Y` : Ubg`Y]b
`Ub[YfgY`bYg`GdY`hU`Y`ž`XUg`Ua`GUa`ghU[ž`XYb`&("5i [i gh
&\$&(ž`a]h`ZØbZ`dUW`YbXYb`6Y[Y[bi b[Yb`Yf`ØZb`Yh`"8]Y`DUfh]Yb
VchYb`nU`fY]WY`Ya`ch]cbU`Y`A`ca`YbhY`i`bX`ØVYffUgWk`YbXY
K`YbXi b[Yb`"6YgcbXYfg`]a` : c`_i`g`ghUbX`XUg`Gd]Y`nk`]gWk`Yb`XYa
G7` : fY]Vi f[`i bX`XYa` `J Z6`Ghi hh[Ufh`ž`XUg`X]Y`A`Åb[Y`]b`XYf
gWk`ÅV]gWk`Yb`A`UbbgWk`UZh`c`ZYb`Y[hY`"

⇒a`YfghYb`Gd]Y`i`bhYf`XYa`bYi`Yb`HfU]bYf`ž``]Ub`GWk`i`ghYfž`XYf`X]Y
B`UWk`Zc`[Y`j`cb`7`f]gh]Ub`GhfY]Wk`Ub`hfUhž`c`hY`XYf`G7` : fY]Vi f[`a`]h
Y]bYa` .%!G]Y[` [Y[Yb`XYb`J Z6`Ghi hh[Ufh[`Y]Wk`a`U`Y]bYb
k`]Wk]h[Yb`8fY]Yf`<]ghc`f]gWk` [YgY`Yb`k`Uf`X]Yg`XYf`YfghY`5i`Zh]hh
XYg`Gh]a`a`V]XYg`bUWk`GhfY]Wk`g`%`!`Å`f][Yf`5a`hgnY]hi`bX`Y]b
dYfZY`hYf`5i`ZhU`h`ZØf`GWk`i`ghYf` : fY]Vi f[`gY`Vgh`VY[Ubb`XUg`Gd]Y`
`c`d`f][ž`[Yf]Yh`YXcWk`Xi`fWk`Y]bY`K`Y`Y`j`cb` ; Y[YbUb[f]ZYb
gWk`bY`]b` : Ø`fi`b["

8Yf`Ui ZfY[YbXY`Gd]Y`j`Yf`Ui Z

8]Y`YfghYb`A`]bi`hYb`XYg`Gd]Y`g`nY][hYbž`XUgg`Ghi`hh[Ufh`Y]Wk`h]bg
<]bhYfhfY`ZYb` [YfUHYb`_ØbbhY`?`i`fn`bUWk`XYa`5bdZ]ZZ`]b`XYf`&`
A`]bi`hYž`gc`f[hY`XYf`J Z6!BYi`ni` [Ub[`9fa`YX]b`8Ya`]fcj`]Wa`]hY]bYa
gY`Yb`gk`YfhYb`GY]hZU`n]Y`Yf`ZØf`XUg`\$.%`8cWk`X]Y` : fYi`XY`k`Å`fhY`
b]Wk`h`Ub[Y`" `X`Yf`&`*`"A`]bi`hY`nc[` : fY]Vi f[g`@`_Ug`?ØV`Yf`Ui`g
ZUgh`&\$`A`YhYfb`UV`i`bX`hfUZ`a`]hY]bYa`GWk`i`ggž`XYf`a`]h

i b[`Ui V`]WYb`%&%`_a #`]bg`i bhYfY`9W`Z]mhY` `%.%`9]bY
Y]bXfi W_gj c``Y`K YbXi b[ž`X]Y`X]Y`GWk UVYb`Ui g`XYa` `?cbnYdh
VfUW`hY`"

Ghi hh[Ufhž`VY`_Ubbh`Z0f`]\fY`ghUf`_Y`@]ghi b[`]a` `Gi dYfW`d`[Y[Yb
@Yj Yf`_i gYbž`ZUbX`]b`XYf` : c`[Y`_Y]b`A`]hY`ž`i a` `X]Y`?cbhfc``Y`ØVYf
XUg`Gd]Y`ni fØW`ni [Yk`]bbYb`": fY]Vi f[`VUi hY`XUfUi ZUi Zi bX
Yfn]Y`hY`]b`XYf`nk`Y`]hYb`<U`VnY]h`nk`Y`]k`Y`]hYfY`HcfY`"Ni b`ÅW`gh`k`Uf
Yg`F`]hgi` `8cUbž`XYf`]b`XYf`) ("A`]bi hY`XYb`6U`k`c``Y`Y`f`ni`Z`Å`][
ØVYf`X]Y`@]b]Y`Vi [g]Yfhi bX` : fY]Vi f[`a`]h`&.%]b` : Ø\fi b[`Vf]b[h`
?ØV`Yf`g]W`YfhY`g]W`XUbb`]b`XYf`*`%"A`]bi hY`a`]h`Y]bYa` `?cdZU`
bUW`Y]bYf`9W`Y`XYb`8cddY`dUW`_i bX`gca`]h`XYb`'`.%!9bXghUbX`"

A`]h`Y]bYa` ` _UfYb`F`ØW`ghUbX`i bX`Y]bYf`gW`k`UW`Yb`@]ghi b[`ghY`h
Ghi hh[Ufh`j`cf`\UfhYb`<YfUi gZcfXYfi b[Ybž`X]Y`X]YgY`GU]gcb`a`]h
g]W`Vf]b[Yb`_ØbbhY`": fY]Vi f[`]b[Y[Yb`]gh`bUW`X]YgYa
gci`j`Yf`ÅbYb`5i`ZhU`_hj`c``a`ch]j`]Yfhi bX`gY`VghVYk`i`ggh`"

NU\`Yb`i`bX` : U`_hYb`

8]Y`9]bgW`Åmi b[`XYg`Gd]Y`g`gd]Y[Y`h`g]W`b]W`h`bi`f`]a` `9f[YVb]g
k`]XYfž`gcbXYfb`nY][`h`Ui`W`X]Y`]bX]j`]Xi`Y``Y`@]ghi b[`XYf`Gd]Y`Yf`
 : fY]Vi f[`k`Uf`b]W`h`bi`f`c`ZZYbg]j`]ghUf`_ž`gcbXYfb` \UhhY`Ui`W`
nU`\fY]W`Y`7`Ub`W`b`Ui`Z`k`Y`]hYfY`HcfY`"Ghi hh[Ufh`\]b[Y[Yb`a`i`gg
g]W`a`]h`Y]bYf`i`a`ghfi`_hi`f]Yfi`b[`Ui`gY]bUbXYfgYhmYbž`X]Y`]a
Gca`a`Yf`b`chk`YbX][`k`i`fXY`i`bX`gck`c``Gd]Y`Yf`U`g`Ui`W`XYb
HfU]bYf`VYhf]Zh`"8]Y`Ghi hh[UfhYf`gW`Y]bYb`gca`]h`Ui`Z`XYa` `ZU`gW`Yb
 : i`»`Yfk`]gW`h`k`cfXYb`ni`gY]b`"

: Øf`GW`i`ghYfž`XYf`ni`gUa`a`Yb`a`]h`j`]Y`Yb`gY]bYf`DfcZ]g`bcW`j`cf
_i`fnYa` `Ui`Z`XYa` `D`Uhn`ghUbXž`k`Uf`X]YgYf`G]Y[`b]W`h`bi`f`Y]b
dYfgØb`]W`Yg`9fZc`[gYf`YVb]g`"9g`k`Uf`Y]b`ghUf`_Yg`NY]W`Ybž`XUgg
XUg`HYUa` `i`bhYf`gY]bYf`@]hi b[` _cb`_i`ffYbnZ`Å`][`]gh`i`bX`Xi`fW`Ui`g
]b`XYf`6i`bXYg`][`U`a`]h`U`hYb`_Ubb`"8]Y`\c`Yb`9fk`Ufhi`b[Ybž`X]Y
Ui`Z`Ghi hh[Ufh`UghYbž`gW`Y]bYb`]a` `?cbhfUgh`ni`XYb`[YnY][`hYb
@]ghi b[Yb`ni`ghY`Yb` `Y]b`i`b[`Y]W`Yf`K`Yhh`_Ua`dZž`XYf` : fU[Yb
Ui`Zk`]fZh`"

⊕ UbXYfYb Gd]Y`Yb`XYg`HU[Yg`a]YhYhY`g]W`<cZZYb\Y]a`a`h
Y]bYa` .&[Y[Yb`?]Y`žk`À\fybX`5i [gVi`f[`i`bX`6fYa`Yb`Y]b
gdUbbYbXYg`&.&Yf`YVhYb"5i`W`A`U]bn`i`bX`i`b]cb`6Yf`]b`hfYbbhYb
g]W`a`h`Y]bYa`i`bYbhgW`]YXYb`j`cb`%`%žk`Ug`nY][hž`XUgg`XYf
K`YhhVYk`YfV`]b`XYf`6i`bXYg`][U`\Ufh`i`a`_`Āa`dZi`V`Y]Vh"

9]b`5i`gV`]W`_`Ui`Z`X]Y`b`ĀW`ghYb`Gd]Y`Y`

Hfchn`XYg`a`]ggfUHybXYb`GhUfhg`k`]fX`Yg`ZØf`Ghi`hh[Ufh`k`]W`h][`gY]bž
gW`bY`ni`fYU[]YfYb`i`bX`Ui`g`XYb`i`Y`Yfb`ni`YfbYb"8]Y
bĀW`ghYb`Gd]Y`Y`k`YfXYb`YbhgW`Y]XYbX`gY]bž`i`a`ni`nY][Ybž`cV
XUg`HYUa`XUg`DchYbn]U`U`Už`g]W`Ui`g`XYa`H]YZdi`b_h`ni`VYZfY]Yb"
⊕ XYf`\Yi`h][Yb`NY]hž`]b`XYf`XYf`8fi`W`_`]a`i`i`»VU`]]a`a`Ybg`]ghž
k`]fX`g]W`nY][Yb`a`ØggYbž`cV`X]Y`GW`k`UVYb`X]Y
<YfUi`gZc`fXYfi`b[Ybž`X]Y`XYf`GU]gcb`ghUfh`\bYb`VfUW`hYž`a`Y]ghYfb
_`ÖbbYb"

8]Y`6YXYi`hi`b[`XYf`YfghYb`6i`bXYg`][U!Gd]Y`Y`

8Yf`5i`ZhU`_h]b`X]Y`bYi`Y`6i`bXYg`][U!GU]gcb`]gh]a`a`Yf`j`cb`[`fc»Yf
6YXYi`hi`b[ž`b]W`h`bi`f`ZØf`X]Y`A`UbbgW`UZhYbž`gcbXYfb`Ui`W`ZØf`X]Y
: Ubgž`X]Y`g]W`bUW`XYb`Gca`a`Yfa`cbUHyb`k`]YXYf`Ui`Z`X]Y`Gd]Y`Y`
ZfYi`Yb"8]Y`YfghYb`DUfh]Yb`_`ÖbbYb`c`Zi`U`g`K`Y[`k`Y]gYf`ZØf`XYb
k`Y]hYfYb`J`Yf`Ui`Z`XYf`GU]gcb`Ub[YgY`Yb`k`YfXYb"9]b`YfZc`[`fY]W`Yf
GhUfh`_`Ubb`XUg`GY`Vgh]`YfhfUi`Yb`XYf`Gd]Y`Yf`ghĀf`_`Yb`i`b`X`Y]bY
d`c`g]h]j`Y`8`mb`Ua`_]`YfnYi`[`Ybž`k`À\fybX`Y]b`bY[`Uh]j`Yf`6Y[`]bb
a`Ö[`]W`Yfk`Y]gY`ni`i`bg]W`Yf\Y]hYb`]a`HYUa`ZØ\fyb`_`Ubb"

Gc`k`i`fXY`VY]gd]Y`gk`Y]gY`XYf`GU]gcb`ghUfh`XYg`G7`i`fY]Vi`f[`i`bhYf
bYi`Ya`HfU]bYf`ž`]Ub`GW`i`ghYf`[`YbUi`VYcVUW`hYh"9f`a`i`gghY
b]W`h`bi`f`XUg`9fVY`j`cb`7`f]gh]Ub`GhfY]W`UbhfYhYbž`gcbXYfb`Ui`W`
g]W`YfghY`Ybž`XUgg`X]Y`A`UbbgW`UZh`Ui`W`c`bY`]b`YfZc`[`fY]W`
V`Y]Vh"9]b`G]Y[`]Y[`Yb`Y]bYb`ghUf`_`Yb`i`Y[`bYf`k`]Y`Ghi`hh[`Ufh`_`Ubb
U`g`6YghĀh][`i`b[`gY]bYf`GhfUHy`[`Y[`Yk`YfhYh`k`YfXYb`i`bX`nY][`hž
XUgg`XYf`i`a`Vfi`W`fYW`hnY]h][`]Y`i`b[`Yb`]gh"

GhUh]gh]_`ni`a`GU]gcb`ghUfh

8]Y`YfghYb`K cWXYb`XYf`6i bXYg`[U`Vf]b[Yb`hfUX]h]cbY``Y]b][Y
]bhYfYggUbhY`GhUh]gh]_Yb`a`]h`g]W`" `#`XYf`GU]gcb`&\$&` #&\$&(
nY][hYb`X]Y`Gd]Y`Yz`XUgg`X]Y`Hcfei`chY`]a` `YfghYb`Gd]Y`hU[`]a
J Yf[`Y]W`ni`XYb`j`cfUb[Y[Ub[YbYb`GU]gcbg`ghUV]`V`]YV" `#`XYb
YfghYb`Gd]Y`Yb`XYf`YmhYb`Z0bZ`GU]gcb!9f0ZZbi`b[Yb`U[Yb`X]Y
HcfY`]a` `8i`fW`gW`b]h`h`k`]gW`Yb`&ž) `i`bX`" `ž\$`dfc`Gd]Y`ž`k` Ug`Ui`ZY]b
`c`Yg`B]j`YUi` `Ub`C`ZYbg]j`Y` `]bXYi`hYh`

8 Uf0VYf` `]bUi`g`_Ub`b`X]Y`J`Yf`Yhni`b[gghUh]gh]_`Y]b`Yb`hgW`Y]XYbXYg
9`Ya`Yb`h`Z0f`XYb`J`Yf`Ui`Z`XYf`GU]gcb`gY]b" `HYUa`gž`X]Y`ni` `6Y[]bb
XYf`GU]gcb`J`Yf`Yhni`b[Yb`Yf`Y]XYbž`a` 0ggYb`c`Zi]a`dfcj`]g]YfYb`i`bX
]`fY`5i`ZghY``i`b[Yb`UbdUggYbž`k` Ug`g]W`Ui`Z`]`fY`@Y]ghi`b[
Ui`gk`]f`_Yb`_Ub`b`"

< YfUi`gZcfXYfi`b[Yb`XYf`bYi`Yb`GU]gcb

8]Y`HYUa`g`[Y`Yb`b]W`h`bi`f`a`]h`<c`ZZbi`b[Yb`i`bX`9fk`Ufhi`b[Yb`]b
X]Y`bYi`Y`GU]gcbž`gcbXYfb`Ui`W`a`]h`VYgh]a`a`hYb
< YfUi`gZcfXYfi`b[Yb`"K`]fhgW`UZh]W`Y`5gdY`_hYž`k`]Y`X]Y`Xi`fW`X]Y
7CJ`-8!%-`!DUbXYa`]Y`Yb`hghUbXYbYb`Z]bUbni]Y``Yb`F`0W`_gh`A`bXYž
`UVYb`X]Y`D`Ubi`b[Yb`j`]Y`Yf`?`i`Vg`VYY]bZi`ggh" `8Yb`7`i`Vg`V`]YV`c`Zh
_Y]bY`UbXYfY`K`U`ž`U`g`Ui`Z`hU`Yb]YfhY`Gd]Y`Yf`Ui`g`XYb`Y][YbYb
F`Y]`Yb`ni`g`YmhYb`c`XYf`↑`b[Y`HU`Yb`hY`ni`Z0fXYfb" `8]Yg`Vf]b[h
gck`c` `F]g]_Yb`U`g`Ui`W`7`UbW`b`a`]h`g]W`ž`XU`↑`b[Y`Gd]Y`Yf`c`Zh
bcW`i`bVYfYW`YbVUf`gY]b`_0bbYb`"

8]Y`Ni`gW`Ui`YfnU`Yb`g]bX`YVYbZU``g`Y]b`_f]h]gW`Yf`Di`b`_h" `8]Y
F`0W`_Y`f`XYf`:`Ub`g`]b`X]Y`GhUX]Yb`[]Vh`XYb`A`UbbgW`UZhYb`Y]bYb
ni`g`h`m`]W`Yb`5b`fY]n`i`bX`9]bZi`ggž`XcW`X]Y`J`YfY]bY`a` 0ggYb
[`Y]W`nY]h][`Ub`XYf`#`ZfUghfi`_hi`fi`bX`XYb`G]W`Yf`Y]hgd`fc`hc`_c``Yb
ZY]Ybž`i`a` `XYb`5bZcfXYfi`b[Yb`[YfYW`h`ni`k`YfXYb`"

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