

VYfZØ`hY`HfUi a n]Y`Y. '9i fcdUg VY`]YVhYghY`GhÅXhY`]a`Cj Yfhci f]ga

9fZU\fyb`G]Yžk Ufi a`8i Vfcj b]_i bX`F\cXcg`U`g`X]Y
a Y]ghVYgi WkhYb` : Yf]YbcfhY`9i fcdUg`[Y`hYb`i bX`k Y`WXY
5i gk]f_i b[Yb`X]Yg`\Uh"

8]Y`Yi fcdÅ]gWXY`FY]gYk Y`Y`\Å`hi bj Yfa]bXYfh`Ubž`i bX`gc`nY][Yb
g]Wk`nU\`fY]WXY`VY`]YVhY`i`f`Ui VgXYgh]bUh]cbYb`gW`ÅX`]WXYb
5i gk]f_i b[Yb`XYg`Cj Yfhci f]ga "'8]YgYf`6Y[f]ZZ`VYgW`fY]Vh`Y]b
D\Åbca Ybž`VY`]XYa`Y]bY`GhUXh`cXYf`FY[]cb`]b`XYb
Gca a Yfa cbUhYb`j cb`Y]bYa`5bghi fa`Ub`Hci f]ghYb`ØVYfZi hYh
k]fX"'8]Y`6Y`Ughi b[`ZØf`X]Y`bZfUghfi`_hi`f`k`ÅW`ghž`i bX`Ui W`X]Y
@VYbgei U`]hÅ`h`XYf`5bk`c`bYf`Y]XYh`ghUf`_"`6Y`gcbXYfg`ghUf`_
VYhfcZYb`g]bX`GhÅXhY`k]Y`J YbYX][`i`bX`5a`ghYfXUa`ž`X]Y`VYfY]hg
a]h`A U» bU`a Yb`fYU[]YfYbž`i a`XYa`Hci f]ghYb`ghfca`9]b`U`h`ni
[YV]YhYb"

≠`J YbYX][`VY]gd]Y`gk Y]gY`k]fX`X]Y`9f`YVi b[`Y]bYf
9]bhf]hng[YVØ`f`UV`&\$&`X]g_i h]Yfh"'8]YgY`A U» bU`a Y`gc`b]Wkh
bi`f`\Y`ZYbž`X]Y`a Ugg]j Yb`A YbgW`Yb`ghf`Oa Y`ni`fY[i`]YfYbž
gcbXYfb`Ui W`X]Yb`9f`U`h`XYf`Y]bn][Ufh][Yb`@U[i`bYb`ghUXh
i`bhYfgh`ØhnYb`"J]Y`Y`9]bk`c`bYf`VYhcbYbž`XUgg`Yg`ZØf`g]Y
ni bY`a YbX`gW`k]Yf][`k]fXž`]\fYb`5`hU[`bcfa U`ni`VYk`Å`h][Yb`
K`Å`fYbX`g]Y`gY`Vgh`XYb`7`Ufa Y`]\fYf`GhUXh`[Yb]Y» Yb`k`c`Ybž
g]bX`]\bYb`c`Zi`Hci f]ghYba UggYb`]a`K`Y["'9]b`6`]W`Ui`Z`X]Y
GhfU» Yb`XYf`GhUXh`j Yff`Å`h`j]Y`ØVYf`X]Y`< YfUi`gZcfXYfi b[Ybž`a]h
XYbYb`X]Y`6Yk`c`bYf`ni`_`Åa`dZYb`\UVYb"

6Y`]YVhYghY`F Y]gYn]Y`Y`i`bX`]`fY
< YfUi`gZcfXYfi b[Yb

8 Yf`HfYbXž`j b`ØVYfZØ`hY`< chgdchg`ni`fY]gYbž`\Uh`ni`Y]bYf
I bhYfgi Wxi b[`Xi fW`XUg` : Yf]Yb\Ui g!6i Wxi b[gdcfhU`<c`X]i
[YZØ\fh`"i bhYf`J Yfk YbXi b[`j cb`8UHyb`XYg
A Uf_hZc f gWxi b[gi bhYfbY\`a Ybg`9i fca`cb]hcf`ϕhYfbUh]cbU`Ui g
XYa`ϕ\`f`&\$&` `k i fXY`Yfa`]hY`hž`k]Y`j]Y`Y`Hci f]ghYb`Ui Z`Y]bYb
9]bk c\`bYf`_ca` a Yb`"8i Vfcj`b]_`]b`?fcUh]Yb`ZØ\fh`X]Y`@]ghY`Ubž
X]Wxi[YZc`[hij`cb`F`cXcg`]b` ; f]YWXYb`UbX`i bX`J YbYX]["

8i Vfcj`b]_`ghY`h`Ub`XYf`Gd]hnY`a`]h`UhYa` VYfUi` VYbXYb`&+
Hci f]ghYb`dfc`9]bk c\`bYf`"8]Y`GhUXh`]gh`b]Wxi`bi`f`ZØf`]\fY
VYY]bXfi`W_YbXY`5fW]hY`_hi`f`VYfØ`a` hž`gcbXYfb`Ui`W`U`g`8fY\`cfh
XYf`<6C!GYf]Y` ; Ua`Y`cZ`H\`fcbYg` "8]Y`5i`gk`]f`_i`b[`Yb`XYg
A UggYb`hci`f]ga`i`g`g]bX`]b`XYb`j`Yfghcd`ZhYb`GhfU`»`Yb`i`bX
ØVYfZØ`hYb`GY`Yb`gk`ØfX][`_Y]hYb`XYi`h]Wxi`g]Wxi`hVUf`":`Øf`FY]gYbXYž
X]Y`X]YgY`GW`Øb`Y]h`c`bY`A`YbgWYba`Yb[`Yb`[`Yb]Y`»`Yb`a`ØW`hYbž
_Øb`hY`Y]bY`FY]gY`]b`XYf`BYVYbgU]gcb`Y]bY`Yf\`c`gUa`Y
5`hYfbUh]j`Y`XUfghY`Yb`"

F`c`Xcgž`X]Y`[`f]YWxi]gWY`ϕgY`ž`_ca`a`h`Ui`Z`&`Hci`f]ghYb`dfc
9]bk c\`bYf`"9]bghY]b`VYgWxi`Ui`]Wxi`Yf`F`ØW`ni`[`gc`fhž`k`]fX`g]Y`bi`b
j`cb`FY]gYbXYb`ØVYffUbbh`"8Yb`bcWxi`[`]Vh`Yg`Ui`Z`X]YgYf`ϕgY`bcWxi
fi`\][`Y`D`À`hnY`k`]Y`J`mWxi`U`6UmicXYf` ; YbbUX]ž`k`c`6Ygi`Wxi`Yf
9f\`c`i`b[`Z]bXYb`_Øb`Yb`"

8]Y`@]ghY`XYf`ghUf`_`ZfYe`i`Yb`h]Yf`hYb`Gh`À`X`hY`

5i ZD`Uhn`XfY]`Zc`[`h`J`YbYX][`a`]h`&%`Hci`f]ghYb`dfc`9]bk c\`bYf`"K`]Y
VYfY]hg`Yfk`À`\`bhž`d`Ub`h`X]Y`GhUXh`j`c`fgc`f[`]Wxi`A`U`»`bU`a`Yb`ž`i`a`X]Y
6Ygi`Wxi`YfnU`\`Yb`ni`ghYi`Yfb`i`bX`gca`]h`X]Y`@YVYbgei`U`]h`À`h`XYf
6Yk`c\`bYf`ni`[`Yk`À`\`f`Y]ghYb`"5`hYfbUh]j`Yb`ZØf`Hci`f]ghYb`ghY`Yb
[`Ya`À`»][`hY`J]Yf`hY`k`]Y`7`UbbUfY[`]c`c`XYf`GUbh`9`Yb`U`XUf`ž`k`c`XUg
Hfi`VY`j`]Y`Y`Wxi`Yhk`Ug`UV[`Y`Y[`h`]gh`"

8]Y`Hcd`ZØb`Z`k`]fX`j`Yfj`c`gh`À`b`X][`h`Xi`fWxi`<`YfU`_]`cb`]b
;`f]YWXYb`UbXž`XUg`%,`Hci`f]ghYb`dfc`9]bk c\`bYf`\`Uh`i`bX`:`c`fYb`n`]b
ϕU`]Yb`a`]h`%(`Hci`f]ghYb`dfc`9]bk c\`bYf`"6Y]XY`Gh`À`X`hY`g]bX`ZØf`]\fY
VYY]bXfi`W_YbXY` ; YgWxi]Wxi`hY`i`bX`?`i`hi`f`VY`_`Ub`bhž`X`c`Wxi`Ui`Wxi`g]Y
Y]XYb`i`bhYf`XYf` ,`VYf`Ughi`b[`Xi`fWxi`Hci`f]ghYb`"

⊕·Y]bYf·K Y·hž]b·XYf·bUW\U·h][Yf·Hci f]ga i g]a a Yf·k]W h][Yf
k]fXž·nY][Yb·X]Y·g]W\·\Ài ZYbXYb·DfchYghY·Ui Z·A U·`cFW·i bX·XYb
? UbUfYbž·XUgg·X]Y·9]b·\Y]a]gWYb·Y]b·i a XYb·Yb·Zc fXYfb"·9g·k]fX
XYi h]Wž·XUgg·X]Y·9bhZU·hi b[·XYg·Hci f]ga i g]b·XYf·\Yi h][Yb·NY]h
b]W h·bi f·J c fHY]Y·ZØf·F·Y]gYbXY·a]h·g]W·Vf]b[hž·gcbXYfb·Ui W
[fc»Y·<YfUi gZc fXYfi b[Yb·ZØf·X]Y·VYgi W hYb·C fHY·a]h·g]W·Vf]b[h"

9]b·6·]W·Ui Z·X]Y·Ni _i bZh·XYg·F·Y]gYbg

8]Y·8mbUa]_·XYg·F·Y]gYbg]j YfÀbXYfh·g]W·ghYh][ži bX·F·Y]gYbXY
a ØggYb·g]W·XYf·J YfUbhk c fhi b[·VYk i ggh·k YfXYbž·X]Y·a]h]·\fYb
5i gZØ[Yb·Y]b·\Yf[Y·\h"·K À·\fYbX·g]Y·X]Y·GW·Øb·\Y]h·Yi fcdÀ]gWYf
GhÅXhY·[Yb]Y»Ybž]gh·Yg]j cb·6YXYi hi b[ž·Ui W·X]Y·6YXØfZb]ggY·XYf
5bk c·\bYf·ni ·fYgdY_h]YfYb"·Ni _ØbZh][_ØbbhY·Y]bY·6U·UbW
nk]gWYb·hci f]gh]gWYf·9fgW·`Y]»i b[i bX·XYa ·9f·\U·h·XYf·`c_U·Yb
@YVYbgei U·]hÅh·XYf·GW·ØggY·ni ·Y]bYa ·bUW\U·h][Yb·i bX
j YfUbhk c fhi b[gj c·`Yb·F·Y]gYb·gY]b"

8]Y·5gdY_hY·XYg·Cj Yf hci f]ga ·g]bX·b]W h·bi f·Ui Z·X]Y·hci f]gh]gWYb
< chgdchg·VYgW·fÀb_h"·a a Yf·a Y·\f·F·Y][]cbYb·i bX·_·Y]bYfY·GhÅXhY
Yf·YVYb·Y]bYb·5bgh]Y[·XYg·6Ygi W YfUbXfUb[gž·XYf·V]g·\Yf·_·Ui a
fY[i ·]Yfh·k i fXY"·8Yf·HfYbX·ni f·?i fnnY]hj Yfa]Yhi b[ž·cZh·ØVYf
D·UhhZcfa Yb·k]Y·5]fvbVž·\Uh·Ui W·`ÀbX·]W·Y·; YV]YhY·YffY]W h"·8c f h
k YfXYb·<Ài gYfž·X]Y·ZfØ·Yf·j cb·9]b·\Y]a]gWYb·VYk c·\bh·k UfYbž
ZØf·Hci f]ghYb·j Yfa]YhYhž·k Ug·X]Y·K c·\bj Yf·\·À·hb]ggY·ZØf·X]Y
UbgÀgg][Y·6Yj Ø·_Yfi b[j YfgW·ÅfZh·i bX·ni ·Y]bYa ·5bgh]Y[·XYf
A]YhdY]gY·ZØ·fh"

⊕j]Y·Yb·@ÀbXYfb·fYU[]YfYb·F·Y][]Yfi b[Yb·i bX·`c_U·Y·6Y·\ØfXYb
Ui Z·X]YgY·9bhk]W·_i b[Yb·a]hi bhYfgW·]YX·]W·Yb·GhfUhY[]Yb"·9]b][Y
GhÅXhYž·k]Y·6UfW·cbUž·\UVYb·VYfY]hg·5bnU·i b[gcVYf[fYbnYb·ZØf
Hci f]ghYbi bhYf·ØbZhY·Y]b[YZØ·fhž·k À·\fYbX·UbXYfYž·k]Y·J YbYX][ž
Ui Z·9]bh]h]hg[YVØ·fYb·gYhnYbž·i a ·XYb·5bghi fa ·VYggYf·ni
ghYi Yfb"·8]YgY·A U»bU·\a Yb·n]Y·Yb·XUfUi Z·UVž·X]Y
BY[Uh]j Ui gk]f·_i b[Yb·XYg·A UggYbhci f]ga i g·Ui Z·X]Y·`c_U·Y
6Yj Ø·_Yfi b[i bX·X]Y·⊕ZfUghfi _hi f·ni ·a]b]a]YfYb"

9]bZi gg·XYf·7C J =8!%- !DUbXYa]Y·Ui Z·XYb

Hci f]ga i g

8]Y`7CJ`8!%-!DUbXYa`]Y`\\Uh`XYb`[`cVU`Yb`Hci f]ga i g`ghUf`
VYY]bhf`ÅW`h][h`5V`&\$\$`Yf`YVhYb`j`]Y`Y`FY]gYn]Y`Y`i`bdfYW`XYb`hYX`
F`ØW`[`Åb`[Y`]b`XYf`6Ygi`W`YfnU`"8]Y`XUfUi`g`fYgi`h]YfYb`XYb`
9]bgW`f`Åb`_i`b`[Yb`ZØ`fhYb`Y`XcW`Ui`W`ni`Y]bYf`_i`fnZf]gh][Yb`
9bhUghi`b`[`ZØf`ghUf`_ZfYe`i`Ybh]YfhY`Gh`ÅXhY"8]YgY`NY]h`k`i`fXY`j`cb`
Y]b][Yb`;`Ya`Y]bXYb`[Ybi`hnhž`i`a`bYi`Y`GhfU`hY`[]Yb`ZØf`Y]b`
bUW`\\U`h][YfYg`Hci f]ga i ga`UbU`[Ya`Ybhni`Y`bhk`]W`Y`b"

@Ui`h`Y]bYa`6Yf]W`h`XYf`I`BK`HC`fi`b]hYX`B`Uh]cbg`K`cf`X`Hci f]ga`
Cf`[Ub]nUh]cb`Ł`]Y`[h`X]Y`k`Y`hk`Y]hY`NU`\\XYf`]bhYfbUh]cbU`Yb`
Hci f]ghYb`]a`\\f`&\$\$%`Yfgha`U`g`k`]YXYf`ØVYf`(\$`\$`A`j`cbYb"æ`
J`Yf`[`Y]W`ni`&\$\$%-`ž`U`g`%ž`A`j`]UfXYb`]bhYfbUh]cbU`Y`Hci f]ghYb`
j`YfnY]W`bYh`k`i`fXYb`ž`]gh`XUg`Y`XcW`Y]bYb`XfUa`Uh]gW`Yb`
F`ØW`[Ub`["6Y`]XYf`K`]YXYfVY`YVi`b`[XYg`FY]gYj`Yf`_Y`fg`VY`[Ub`bYb`
j`]Y`Y`8Ygh]bUh]cbYb`ž`X]Y`A`Ö`[`]W`_Y]h`Y]bYg`bUW`\\U`h][Yb`
Hci f]ga i g`]b`XYb`:`c`_i`g`ni`f`ØW`_Yb"8]Y`9]b`\\Y]a`]gW`Yb`ZcfXYfb`
ni`bY`a`Yb`X`Y]bY`F`ØW`_Y`f`ni`Y]bYa`[Ya`Å»][hYb`Hci f]ga i g`ž`XYf`
XYf`;`Ya`Y]bgW`U`Z`h`ni`[i`hY`_ca`a`hž`ghU`h`g]Y`ni`VY`UghYb"

; `cUV`HfYbXg`]a`Hci f]ga i g

8Yf`HfYbX`ni`bUW`\\U`h][Ya`FY]gYb`]gh`Åb`[gh`b]W`h`a`Y`f`bi`f`Y]bY`
F`Ub`X`b`ch]n"J`]Y`Y`FY]gYb`XY`g]b`X`g]W`X`Yf`Ö`c`c`[]gW`Yb`i`b`X`
gcn]U`Yb`5i`gk`]f`_i`b`[Yb`]`fYg`FY]gYbg`VYk`i`ggh`i`b`X`gi`W`Yb`U`_h]j`
bUW`i`a`k`Y`h`ZfYi`b`X`]W`Yb`5`hYfbUh]j`Yb"@Ui`h`Y]bYf`I`a`ZfU`[Y`j`cb`
6cc`_]b`["W`ca`Ui`g`XYa`\\f`&\$\$`i`[UVYb`,`%i`XYf`FY]gYb`XYb`Ub`ž`
XUgg`g]Y`bUW`\\U`h][Y`FY]gYb`U`g`k`]W`h][`YfUW`hYb`i`b`X`VYfY]h`
k`ÅfYb`ž`XU`ZØf`a`Y`f`ni`VY`nU`\\Yb"

8Uf`ØVYf`\\]bUi`g`nY][h`Y]bY`Ghi`X]Y`ž`XUgg`8Ygh]bUh]cbYb`ž`X]Y`
bUW`\\U`h][Y`DfU`_h]_Yb`ZØf`XYfb`ž`]b`XYb`_ca`a`Yb`XYb`\\f`Yb`
j`cfUi`gg]W`h]W`Y]bY`\\Ö`YfY`5bnU`\\Ub`6Ygi`W`Yfb`j`YfnY]W`bYb`
k`YfXYb"FY]gYb`XY`gi`W`Yb`ni`bY`a`Yb`X`bUW`9f`YVb]ggYb`ž`X]Y`
gck`c`\\`Ui`h`Yb]gW`U`g`Ui`W`i`a`k`Y`h`VYk`i`ggh`g]b`X`ž`k`Ug`j`]Y`Y`
Gh`ÅXhY`X`Uni`nk`]b`[hž`]`fY`5bg`ÅhY`ni`ØVYf`XYb`_Yb`i`b`X`]`fY`
5b`[YV`chY`Yb`hgd`fYW`Yb`X`Ub`ni`dUggYb"8]Y`æ`d`Ya`Ybh]Yfi`b`[

bUW\U`h][Yf`DfU_h]_Yb`]a `Hci f]ga i g`]gh`b]W\h`bi f`Y]b`HfYbXž
gcbXYfb`k]fX`Ui W\`ni bY\`a YbX`ni `Y]bYf`Bchk YbX][_Y]h"

⇒ `5bVYhfUW\h`X]YgYf`9bhk]W_`i b[Yb`nY][h`g]W\ž`XUgg`Y]b
l a XYb_Yb`]a `Hci f]ga i ggY_hcf`YfZcfXYf`]W\`]gh"l a `XUg
; `Y]W\ [Yk]W\h`nk]gW\Yb`XYb`6YXØfZb]ggYb`XYf`FY]gYbXYb`i bX
XYf`@YVYbgei U`]h`h`XYf`9]b\`Y]a]gW\Yb`ni `k U\`fYbž`g]bX
]bbcj Uh]j Y`@Øgi b[Yb`i bX`X]Y`Ni gUa a YbUfVY]h`U`Yf`6YhY`][hYb
[YZfU[h`Bi f`gc`_ØbbYb`X]Y`<YfUi gZcfXYfi b[Yb`XYg`Cj Yfhci f]ga
`Ub[Zf]gh][`[Ya Y]ghYfh`k YfXYb"

8YhU]`g

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