

J`c f g]W\ h. : U`gW\ Y`Dc`n]ghYb`Yf[Ui bYfb
; Y`X`j`c b`F Yb hb Yf]b`]b : `YbgVi f[

⊕: `YbgVi f[`Yf\]Y`h`Y]bY`F Yb hb Yf]b`Y]bYb`GW\ cW_Ubfi Zj`c b
ZU`gW\ Yb`Dc`n]ghYb`i bX`ØVYf[UV`Y]bYb`\c\Yb`; Y`XVYhfU["
Gc`gW\ØhnYb`G]Y`g]W\`

⊕`XYb`Y`h`h`Yb`HU[Yb`k`i`f`X`Y`]a`?`f`Y]g`GW\`Y`g`k`][`!:`YbgVi f[`i`b`X`]b
XYf`G`h`U`X`h`:`YbgVi f[`j`c`f`Y]bYa`VYgc f[b]gYffY[YbXYb`D`À`b`c`a`Y`b
[Yk`U`f`b`h`ZU`gW\ Y`Dc`n]Y]VYUa`h`Y`h`À`h][Yb`j`Y`f`a`Y`\`f`h`GW\ cW_Ubfi ZY
VY]`6`Ø`f[Yf`b`"8]YgY`VYhfØ[Yf]gW\ Yb`5`b`fi ZY`[Yf`U`h`Y`b`b`i`b
VYgcbXYfg`]b`XYb`:`c`_`i`g`X`Y`f`?`f`]a`]b`U`d`c`n]Y]: `YbgVi f[ž`X`U`Y]bY
+*!`À`\f][Y`F`Y`b`h`b`Y`f]b`U`a`'8]Yb`g`h`U[ž`X`Y`a`'&`\$`"5i [i gh&\$&(ž`b`U`W\
Y]bYa`gc`W\ Yb`5`b`fi ZY]bY`Y`f`Y`V`]W\ Y`G`i`a`a`Y`6`U`f[Y`X`Ø`V`Y`f[UV`

⊕`Y]bYa`VYgc f[b]gYffY[YbXYb`J`c`f`ZU`k`i`f`X`Y`X]Y`À`h`Y`f`Y`8`U`a`Y
j`c`b`Y]bYa`5`b`fi ZYfž`X`Y`f`g]W\`U`g`Dc`n]Y]VYUa`h`Y`f`U`i`g[UV`ž`i`b`h`Y`f`
8`fi`W`_`[YgY`h`h`i`b`X`X`U`n`i`[YV`f`U`W\`h`ž`Y]bYb`\c\Yb`; Y`XVYhfU[`]b`V`U`f`
k`Y]h`Y`f`n`i`[YVYb`"8]YgY`:`À`Y`g]b`X`VYgcbXYfg`U`U`f`a`]Y`f`Y`b`X`ž`X`U`g]Y
b]W\`h`b`i`f`Z]b`U`b`n]Y`Y`Y`G`W\`À`X`Y`b`j`Y`f`i`f`g`U`W\`Y`b`ž`g`c`b`X`Y`f`b`U`i`W\`X`U`g`
G]W\`Y`f`\`Y]hg[YZØ`\`X`Y`f`6`Ø`f[Yf`V`Y`Y]b`h`f`À`W\`h][Yb`"

K]W\ h][Y`H]d`d`g`ZØf`X`Y`b`l`a`[Ub[`a`]h
6Yhfi [gUbfi ZYb

l`a`k`Y]h`Y`f`Y`b`G`W\`U`X`Y`b`n`i`j`Y`f`a`Y]X`Y`b`ž`\`U`h`X]Y`Dc`n]Y]d`f`À`j`Y`b`h]j`Y
A`U`»`b`U`\`a`Y`b`i`b`X`<]b`k`Y]g`Y`n`i`f`J`Y`f`ZØ[i`b`[`i`[Y`g`h`Y`h`ž`X]Y`Y`X`Y`f`
6`Ø`f[Yf`_`Y`b`b`Y`b`g`c`h`Y`"8`U`n`i`[Y\`Ø`f`h`i`b`h`Y`f`U`b`X`Y`f`Y`a`ž`g]W\`U`a`
H`Y`Y`Z`c`b`b]W\`h`i`b`h`Y`f`8`fi`W`_`g`Y`h`n`Y`b`n`i`U`g`g`Y`b`i`b`X`]a`N`k`Y]Z`Y`g`ZU`
Y]b`Z`U`W\`U`i`Z`n`i`Y`[Yb`"8]Y`Dc`n]Y]VY`h`c`b`h`U`i`W\`ž`X`U`g`g`6`Ø`f[Yf`_`Y]b`Y`
⊕`Z`c`f`a`U`h]c`b`Y`b`Ø`V`Y`f`\`f`Y`Z]b`U`b`n]Y`Y`b`J`Y`f`\`À`h`b]g`g`Y`\`Y`f`U`i`g[YVYb`
g`c`h`Y`b`ž`X`U`X]Y`g`_`f`i`d`Y`c`g`Y`6`Y`h`f`Ø[Yf`b`i`f`V`Y`g`h`f`_`h`"

8]Y`5i h\Ybh]Z]n]Yfi b[`j cb`5a hgdYfgcbYb`]gh`Y]b`k`Y]hYfYf
k]W\h][Yf`Di b_h`9g`k]fX`Ya dZc\`Ybž`VY]`Ni gW\ f]ZhYb`j cb
j Yfa Y]bh]W\Yb`6YUa hYb`gY`Vgh`X]Y`cZZ]n]Y`Yb`HY`YZcbbi a a Yfb
\YfUi gni gi W\Yb`i bX`VY]`J YfXUW\h`Ubni fi ZYb``9VYbgc`gc``hY
XUfUi Z[YUW\hYh`k YfXYbž`b]Ya U`g`i bVY`UbbhY`DYfgcbYb`]b`X]Y
Y][YbYb`j]Yf`K `AbXY`ni ``UggYbž`gc bXYfb`X]YgY`i a `Y]bYb
8]YbghUi gk Y]g`ni `V]hhYb`` 8]Y`Dc`]nY]`k]fX`b]Ya U`g`i a
; Y`XVYhfÅ[Y`V]hhYb` ž`VYhcbh`X]Y`Dc`]nY]`_`Uf"

8]Y`5i Z_`Àfi b[gUfVY]h`XYf`Dc`]nY]`]gh`]b`gc`W\Yb`G]hi Uh]cbYb
YbhgW\Y]XYbX``9g`]gh`fUhgUa ž`bUW\`Y]bYa `gc`W\Yb`5bfi Z`gcZcfh
XYb`Dc`]nY]bchfi Z%%\$`ni `k `A\`Ybž`Ui W\`k Ybb`_Y]b`]; Y`X
ØVYf[YVYb`k i fXY``>XY`A`Y`Xi b[`]Zhž`X]YgY`6Yhfi [ga UgW\Yb
Ui Zni XYW`Yb`i bX`k Y]hYfY`CdZYf`ni `j Yf\]bXYfb"

9]b`5bgh]Y[`XYf`6Yhfi [ga UgW\Yb

8]Y`<`Ài Z][_Y]h`X]YgYf`VYhfØ[Yf]gW\Yb`GW`cW`Ubfi ZY`\Uh]b`XYb
`YhnhYb`A`cbUhYb`ni [Ybca`a`Yb``9g`ghY``h]g]W\`X]Y]: fU[Yž`cV
[YgY``gW\UZh]W\Y`i a gh`AbXY`i bX`X]Y`i bg]W\Yf\Y]hYb`]b`XYf
U`hi Y``Yb`NY]hž`k]Y`k]fhgW\UZh]W\Y`6Y`Ughi b[Ybž`Y]bY`F`c``Y`VY]
X]YgYf`Ni bU`a`Y`gd]Y`Yb``J`cf`U``Ya` `À`hYfY`A`YbgW\Yb`g]bX`\`Ài Z][
N]Y`gc`W\Yf`5b[f]ZZYž`k Ug`X]Y`K]W\h][_Y]hj`cb`5i Z_`Àfi b[`i bX
Df`Aj Ybh]cb`i a`gc`a`Y`f`i bhYfghfY]W\h"

8]Y`9fa]hh`i b[Yb`XYf`?`f]a]bU`dc`]nY]`nY][Ybž`XUgg`]b`XYb`a`Y]ghYb
: `À``Yb`gY`f`À`b`]W\Y`A`UgW\Yb`j`Yfk`YbXYh`k`YfXYb``6YhfØ[Yf
[YVYb`g]W\`U`g`Dc`]n]ghYbž`GhUUhgUbk `À`hY`c`XYf`UbXYfY
6Y\`ØfXYbj`YfhfYhYf`Ui`gž`i`a``Y[]h]a`Y`?`fY]gY`ni`gW\UZZYbž`]b`XYbYb
g]Y`\`fY`5XfYggUhYb`i`bhYf`8`fi`W`gYhnYb`_`Øb`Yb``8]YgY
J`cf[Y\Yb`gk`Y]gY`hfÅ[h`ni`a`G`W`c`W`i`bX`ni`f`i`bg]W\Yf\Y]h`VY]`XYb
6Øf[Yfb`VY]`i`bX`V]YhYh`XYf`Dc`]nY]`Y]bYb`gh`AbX][Yb
<`UbX`i`b[gVYXUfZ"

Ni`g`À`h`]W\`]gh`Yg`VY`gc`b`XY`fg`k`]W\h][ž`XUgg`g]W\`B`UW\`V`U`fb
[Y[YbgY]h][`]bZcfa`]YfYb``K`Ybb`a`Ub`gY`Vgh`Y]bYb`5bfi`Z`c`XYf
Y]bYb`J`cf`ZU``VY`a`Yf`_`hž`gc``hY`a`Ub`XYb`5i`ghUi`gW\`a`]h`Ub`XYfYb
gi`W\Ybž`i`a`gc`j`]Y`Y`6Øf[Yf`k`]Y`a`Ø[`]W\`j`cf`dchYbh]Y``Yb

6Yhf0[Yfb`ni`gW\0hnYb"

GW\ i hna U» bU\ a Yb`Z0f`60f[Yf

8]Y`Dc`nY]`k]fX`k Y]hYf\]b`j Yfgi W\Ybž`X]Y`60f[Yf`Ui Zni`_`ÀfYb`i bX
g]Y`0VYf`gc`W\Y`6Yhfi [gj Yfgi W\Y`ni`]bZcfa`]YfYb`"9g`]gh
YbhgW\Y]XYbXž`XUgg`X]Y`6Yj 0`_Yfi b[`k UW\gUa`V`Y]Vhi bX
_f]h]gW\Yg`8Yb`_Yb`0Vhž`k Ybb`g]Y`a`]h`gc`W\Yb`5bfi ZYb`_cbZfcbh]Yfh
k]fX`" `bXYa`a`Ub`X]Y`H]ddg`XYf`Dc`nY]`VYZc`[hž`_Ubb`^XYf
9]bnY`bY`XUni`VY]hfU[Ybž`g]W\`i bX`UbXYfY`VYggYf`ni`gW\0hnYb"

<]bhYf[fi bX]bZcfa Uh]cbYb`ni

GW\ cW_Ubfi ZYb

GW\cW_Ubfi ZY`ghY`Yb`Y]bY` : cfa`XYg`hY`YZcb]gW\Yb`6Yhfi [g`XUfž
VY]`XYa`HÀhYf`g]W\`U`g`Dc`nY]VYUa`hY`cXYf`UbXYfY`Ui hcf]g]YfhY
DYfgcbYb`Ui g[YVYbž`i a`U\bi b[g`cgY`CdZYf`Z]bUbn]Y`
Ui gni`bY\`a`Yb`"8]Y`A UgW\Y`\Uh]g]W\`]b`XYb`YmhYb`^U\`fYb`ghUf_
j YfVfY]hYhž`]bgVYgcbXYfY`]b`8Yi hgW\`UbXž`k c`Yg`a`Y\`fYfY
A`Y`Xi b[Yb`0VYf`XYfUfh][Y`J`cfZÀ`Y`[]Vh`" `b`j]Y`Yb` : À`Yb`k YfXYb
À`hYfY`A`YbgW\Yb`[Yn]Y`h`Ub[YgdfcW\Ybž`XU`X]YgY`cZh`k Yb][Yf
j YfhfUi h`a`]h`a`cXYfbYb`?ca`a`i`b]_Uh]cbga`]hY`b`g]bX`i`bX
Yj Ybhi Y`a`Y\`f`J`YfhfUi Yb`]b`5i hcf]hÀhgdYfgcbYb`gYhnYb"

8Yf`k]fhgW\UZh`]W\Y`<]bhYf[fi bX`X]YgYf`6Yhfi [gZcfa`]gh
j]Y`gW\]W\h]["8]Y`HÀhYf`bi hnyb`Ya`ch]cbU`Y`A`Ub]di`Uh]cb`i`bX
8fi W_ž`i a`]\`fY`CdZYf`ni`Y]bYf`gcZcfh][Yb` ; Y`X0VYf[UVY`ni
VYk Y[Yb`"9]bY`Ghi`X]Y`Ui g`XYa`^U\`f`&\$&'`U`h`Yf[YVYbž`XUgg
Yhk U`(\$`i`XYf`6YZfU[hYb`VYfY]hg`Y]ba`U`Y]bYb`gc`W\Yb`5bfi Z
Yf\U`hYb`\UVYbž`YXcW\`bi`f`Y]b`_`Y]bYf`HY]`hUhgÀW\`]W\` ; Y`X
0VYfk]YgYb`\Uh`"9g`k]fX`[YgW\`Àhnhž`XUgg]b`8Yi hgW\`UbX`Xi`fW
GW\cW_Ubfi ZY`À\`f`]W\`A`j`]cbYbVYhfÀ[Y`YfVYi hYh`k YfXYb"

F YW\ h`]W\ Y`A U» bU\ a Yb`i bX`Dc`nY]U_h]cbYb

8]Y`Dc`nY]`]gh`g]W\`XYg`DfcV`Ya`g`VYk`i`ggh`i`bX`\Uh]j`YfgW\]YXYbY
`b]h]Uh]j`Yb`[YghUfhYhž`i`a`X]Y`6Yj`0`_Yfi`b[`0VYf`X]Y` ; YZU\`fYb`j`cb

GWcW_Ubfi ZYb`Ui Zni _`ÀfYb"FY[Y`a À»][Y
ϑZcfa Uh]cbg_Ua dU[bYb`i bX`X]Y`Ni gUa a YbUfVY]h`a]h
; Ya Y]bXYb`gd]Y`Yb`Y]bY`YbhgW`Y]XYbXY`F c`Y`VY]`XYf
J Yf\]bXYfi b[`gc`W`Yf`J cfZ`À`Y"6Y\ÒfXYb`k]Y`X]Y`6i bXYgdc`]nY]
j YfÒZYb`h]W`Yb`fY[Y`a À»][ϑZcfa Uh]cbYb`i bX`F UhgW`À[Y`zi a
6Øf[Yf`ni `gYbg]V`]g]YfYb"

Ni XYa `[]Vh`Yg`fYW`h]W`Y`GW`f]hhY`ž`X]Y`[Y[Yb`X]Y`H`hYf
i bhYfbca a Yb`k YfXYb`_ÒbbYb"8]Y`GhfU] YfZc`[i b[`[YghU`hY`h]g]W`
YXcW`cZhigW`k]Yf][ž`XU`X]Y`5bfi ZYf`Ài Z][`Ubcbma `V`Y]VYb`cXYf
Ui g`XYa `5i g`UbX`cdYf]YfYb"8]Yg`YfgW`k Yfh`X]Y`→XYbh]Zn]Yfi b[
i bX`J Yf\U`Zhi b[`XYf`6YhfØ[Yf`Yf\YV`]W`"ϑ`Y]b][Yb`: À`Yb`\UVYb
]bhYfbUh]cbU`Y`Dc`]nY]U`h]cbYb`ni f`: YghbU`a Y`j`cb`?f]a]bY`Yb
[YZØ\fhž`X]Y`]b`[fc»Ya `Gh`]U[]YfhYb"

GhUh]gh]_Yb`ni f`? f]a]bU`]h`h`Xi fW` GWcW_Ubfi ZY

@Ui h`Y]bYf`U`hi Y`Yb`9f\YVi b[`XYf`Dc`]nY]`B F K `[UV`Yg]a `→\f
&\$&']b`BcfXf\Y]b!K YghZU`Yb`Y]bYb`5bgh]Y[`j`cb`ØVYf`) \$i `VY]
GWcW_Ubfi ZYb`]a `J Yf[`Y]W`ni a `J cf`U`f"ϑ`XYb`YfghYb`gYW`g
A cbUhYb`XYg`→\fYg`&\$&(`k`i`fXYb`VYfY]hg`%`&\$`\$`: À`Y`fY[]ghf]Yfhž
k`cVY]`X]Y`8i b`_Y`n]ZYf`gW`Àhni b[gk`Y]gY`k`YgYbh]W`"\Ò\Yf`Y]Y[hž
XU`j]Y`Y`C`dZYf`g]W`b]W`h`hfUi Yb`ž`5bnY][Y`ni `Yf\YVYb"

Ni g`Àh`]W`nY][Yb`ghUh]gh]gW`Y`9f\YVi b[Yb`ž`XUgg`X]Y`Z]bUbn]Y`Yb
GW`ÀXYb`ž`X]Y`Xi fW`gc`W`Y`6Yhfi [gj`Yfgi W`Y`YbhghY`Yb`ž]a `→\f
&\$&']bg[YgUa`h`Yhk`U`+`A`]`cbYb`9i fc`VYhfi [Yb"8]Y`N]Y`[fi`ddY
g]bX`j`cf`U`Y`a`GYb]cfYb`ž`k`Ug`X]Y`5`Ufa`VYfY]hgW`UZh`XYf`Dc`]n]ghYb
i bX`gcn]U`Yb`9]bf]W`hi b[Yb`k`Y]hYf`Ub`Y]nh"

8]YgY`NU`\Yb`j`YfXYi`h]W`Yb`b]W`h`bi`f`XUg`ni`bY`a`YbXY`5i`ga`U`
XYf`DfcV`Ya`Uh]_ž`gcbXYfb`Ui`W`X]Y`B`chk`YbX][`_Y]hž`df`Àj`Ybh]j`Y
A`U`bU`a`Yb`ni`Yf[`fY]ZYb`ž`i`a`VYhfc`ZYb`Y`;`fi`ddYb`ni`gW`Øh`nYb
i`bX`ØVYf`6Yhfi`[`ga`UgW`Yb`Ui`Zni`_`ÀfYb"

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