

J]Y`ZU`h`Yf`YVYb.`BYi Yg`j `g!Dfc[fUa a `]b
: fYmi b[!; fUZYbUi `dfÀgYbh]Yfh

8 Ug`bYi Y`j `g!GYa YghYfdfc[fUa a `ZØf`<YfVgh#K]bhYf
&\$&(#&) `]b : fYmi b[!; fUZYbUi `V]YhYh((, `5b[YVchYž
XUfi bhYf`K cf_g\cdg`i bX`GYa]bUfY"

⊕ : fYmi b[!; fUZYbUi `k i fXY`j cf`_i fnYa `Y]b`bYi Yg
GYa YghYfdfc[fUa a `XYf`J c`_g\cWgWxi `Y`fj `gŁ:ZØf`XUg
<YfVgh#K]bhYf!GYa YghYf`&\$&(#&) `j cf[YghY`h" A]h
VYY]bXfi W_YbXYb` ((, `5b[YVchYb`]b`i bhYfgW]YX`]WYb : cfa UhYbž
j cb`J cfhfÀ[Yb`i bX`K cf_g\cdg`V]g`\]b`ni `fYUh]j Yb`?i fgYb`i bX
_i `hi fY`Yb`9i _i fg]cbYbž`nY][h`g]W`X]Y`j `g`U`g`Y]b`C fh`XYf
K Y]hYfV]Xi b[`i bX`?i `hi f" 8]Y`ghY`j YfhfYhYbXY`@UbXfÀh]b`<Y`[U
K Y]bVYf[Yf`k Uf`VY]`XYf`DfÀgYbhUh]cb`XYg`bYi Yb`Dfc[fUa a g`]b
XYf`j `g!; YgW`ÀžgghY`Y`]b : fUZYbUi `Ubk YgYbX`i bX`VYhc`bhY`X]Y
J]Y`ZU`h`XYf`5b[YVchY"

8 Ug`bYi Y`Dfc[fUa a `YZh]gh`Zf]gW` [YXfi W`hi bX`ghY`h`XYb
⊕hYfYgg]YfhYb`ni f`J YfZØ[i b[" 8]Y`6UbXVfY]hY`XYf`?i fgY`fY]W`h
j cb`hfUX]h]cbY`Yb`H\Ya Yb`V]g`ni `a cXYfbYb`HfYbXgž`X]Y`XYb
U_hi Y`Yb`5bZcfXYfi b[Yb`i bX`⊕hYfYggYb`XYf`6Yj Ò`_Yfi b[
FYW`bi b[`hfU[Yb`"J cf`U`Ya `X]Y`_fYUh]j Yb`?i fgY`YfZfYi Yb`g]W`
[fc»Yf`6Y`YVh\Y]hž`XU`g]Y`XYb`HY]`bY`a Yfb`X]Y`A Ò[`]W`_Y]h
V]YhYbž`]fY`_ØbghYf]gW`Yb : À\][_Y]hYb`ni `YfdfcVYb`cXYf
Ui gni VUi Yb"

? i fgY `ZØf`^YXYb `; YgW`a UW_

9]b`VYgcbXYfg`\Yfj cfni `YVYbXYg`5b[YVch]a `bYi Yb`GYa YghYf
]gh`XYf`?i fg` K U]X`Yf]gW`j Y[Ub`[Y_cW`h "`<]Yf`k YfXYb`X]Y
HY]`bY`a Yf`]b`X]Y`?i bgh`XYg`j Y[UbYb`?cW`Ybg`Y]b[YZØ`fhž`k cVY]

XYf': c_i g'Ui ZfY []cbU`Yb`i bX`gU]gcbU`Yb`Ni hUHyb`Y[h"8 Ug`]gh
b]W`h`bi`f`Y]b`HfYbXž`gcbXYfb`Ui W`Y]bY`[Ygi bXY`i bX
i a k`Y`hVYk i gghY`9bhgW`Y]Xi b[ž`X]Y`]a a Yf`a Y`f`A YbgW`Yb
Ubn]Y`h"

8 Ug`j` \g! Dfc[fUa` a`]gh`VY`_Ubb`h`XUZ`fž`XUgg`Yg`b]W`h`bi`f`
6]`Xi b[gUbZcfXYfi b[Yb`YfZ`hž`gcbXYfb`Ui W`F`Ui`a`Z`f`
dYfg`Òb`]W`Y`9bhk`]W`_i b[`i bX`:`fY]nY]h[YghU`hi b[`V]YhYh"8]Y
A]gW`i b[`Ui`g`@Y`f]b`U`hYb`i bX`[YgY`][Ya`A`]hY]bUbXYf`]gh`Y]bY
VYk`À`f`hY`Gh`À`f`_Y`XYf`J`c`_g`c`W`g`W`i`Y`"8]Y`VYgcbXYfY`6Yhcbi b[
Ui ZfY []cbU`Y`H`Y`a`Yb`i bhYfghfY]W`h`X]Y`J`YfVi bXYb`Y]h`a`]h`XYf`
I`a`[YVi b[`i bX`Z`f`XYf`h`X]Y`X`Yb]h`h`]bbYf`U`V`XYf`; Ya`Y]bgW`UZh"

B`Y`V`Y`b`X`Ya`_i`]bUf]gW`Yb`6YfY]W`[]Vh`Yg`Ui W`Y]bY`J]Y`n`U`U`Ub
K`cf`_g`c`dg`i bX`G`Ya`]bUfYbž`X]Y`g]W`a`]h`H`Y`a`Yb`k`]Y`; Ygi bX`Y]hž
B`U`h`i`f`i`bX`_fYU]h]Yg`G`W`U`Z`Y`b`Ui`gY]bUbXYfgYhYb"8]YgY
5b[YVchY`f]W`hYb`g]W`U`b`U`Y`5`hYfg[fi`ddYb`i bX`hYfYggYb`i bX
a`U`W`Y`b`X]Y`j` \g`ni`Y]bYa`UhhfU`_h]j`Yb`5i`gV]`Xi b[gc`fh`Z`f`
@YVYbg`Ub[Yg`@YfbYb"

8 Ug`[fc»`Ub[Y`Y[hY`5b[YVchž`XUg`]b`X]YgYf': cfa`d`f`À`g`Y`bh]Yf`h
k`]fXž`nY][hž`XUgg`X]Y`J`c`_g`c`W`g`W`i`Y`b]W`h`bi`f`
6]`Xi b[gj`YfUbghU`hi b[Yb`cf[Ub]g]Yf`hž`gcbXYfb`Ui W`Y]bYb
VYXYi hYbXYb`_i`hi`fY`Yb`6Y]hfU[`ni`f`F`Y[]cb`Y]ghYh"8]Y`j` \g
Z`f`XYf`h`b]W`h`bi`f`]bX]j`]Xi`Y`Y`@YVYbgei`U`h`hž`gcbXYfb`Ui W`XUg
gc`n]U`Y`A`]hY]bUbXYf`Xi`f`W`X]Y`j`YfgW`]YXYbYb`; fi`ddYb`_i`fgY`i`bX
J`YfUbghU`hi b[Yb"

9]b`k`Y]hYfYf`J`cfhY]`XYg`b`Yi`Yb`Dfc[fUa`a`g`]gh`X]Y`:`Yi`]V]`]h`hž`X]Y
Yg`HY]`b`Y`a`Yfb`Yfa`Ò[`]W`hž`g`ck`c`\\`J`cfa`]hhU[g!`U`g`Ui`W`
5VYbX`_i`fgY`ni`VYgi`W`Yb"8]Yg`VYf`Ø`W`_g]W`h][`h`X]Y
i`bhYfgW`]YX`]W`Yb`@YVYbgfYU`]h`hYb`XYf`A`YbgW`Yb`]b`XYf`F`Y[]cbž
]bgVYgcbXYfY`Z`f`Y`b`Y`ž`X]Y`a`Ò[`]W`Yfk`Y]gY`hU[g`Ø`VYf`VYgW`À`Zh][`h
g]bX"8]Ua`]h`k`]fX`X]Y`j` \g`ni`Y]bYa`C`fhž`XYf`@YfbYb`i`bX
dYfg`Òb`]W`Y`9bhk`]W`_i b[`]b`Y]bYa`UhhfU`_h]j`Yb`F`U`a`Yb`Z`f`XYf`h"

Ni`g`h`h`]W`ni`f`[fc»`Yb`5i`gk`U`U`U`b`?i`fgYb`k`]fX`Ui`W`Y]bY
j`YfVYggYf`hY`C`b`]bY!5ba`Y`Xi`b[`Ub[YVchYbž`i`a`XYb`Ni`[Ub[`Z`f`

U`Y` ðhYfYgg]YfhYb`ni`Yf`Y]W`hYfb" `8Yf`X][]hU`Y`Ni [Ub[`gcf[h
XUZØfž`XUgg`g]W`X]Y`HY]`bY`a`Yf`VYeI`Ya`j`cb`ni`<Ui`gY`Ui`g`ØVYf
X]Y`5b[YVchY`]bZcfa`]YfYb`i`bX`Uba`Y`XYb`_`ÒbbYbž`k`Ug`[YfUXY`]b
XYf`Yi`h][Yb`NY]h`j`cb`[fc»Yf`6YXYi`hi`b[`]gh"

9]b`6`]W`_]b`X]Y`Ni`_i`bZh`XYf`j` \g

8]Y`J`c`_g`cW`gW`i`Y`]b`: fYmi`b`[!; fUZYbUi`nY][`h`a`]h`]\fYa
VfY]hYb`?i`fgUb[YVchž`XUgg`g]Y`Y]bY`nYbhfU`Y`F`c`Y`]b`XYf
6]Xi`b[g`_i`h`i`f`XYf`F`Y`[]cb`Y]bb]a`a`h`8`Ug`bYi`Y
GYa`YghYfdfc[fUa`a`ghY`h`g]W`Yfž`XUgg`j`YfgW`]YXYbY` ðhYfYggYb
UV[YXYW`h`k`YfXYb`i`bX`YXYf`X]Y`A`Ò[`]W`_Y]h`U`hž`B`Yi`Yg`ni
`YfbYb`i`bX`g]W`Ui`gni`dfcV]YfYb" `9g`V`Y]Vh`gdUbbYbX`ni
VYcVUW`hYbž`k`]Y`X]Y`A`YbgW`Yb`Ui`ZXUg`bYi`Y`5b[YVchfYU[]YfYb
i`bX`k`Y`W`Y`?i`fgY`VYgcbXYfg`[YZfU[h`gY]b`k`YfXYb"

Ni`gUa`a`YbZUggYbX`Äggh`g]W`gU[Ybž`XUgg`X]Y`j` \g`b]W`h`bi`f`Y]b
6]Xi`b[gnYbhf`i`a`]ghž`gcbXYfb`Y]b`YVYbX][Yf`C`fh`XYf`6Y[Y[bi`b[
i`bX`XYf`_fYUh]j`Yb`9bhZU`hi`b["8]Y`Df`ÄgYbhUh]cb`XYg`bYi`Yb
Dfc[fUa`a`g`]gh`Y]b`k`Y]hYfYf`GW`f]h`i]b`X]Y`Ni`_i`bZh`XYf`b]W`h`bi`f`
VYghY`YbXY`HY]`bY`a`Yf`UbgdfYW`Ybž`gcbXYfb`Ui`W`bYi`Y
ðhYfYgg]YfhY`[Yk`]bbYb`k`]fX"

bYi`Y`UhhfU`_h]j`Y`?i`fgUi`gk`U`U`Ui`Zž]bgVYgcbXYfY`XUg`5b[YVch
K`U]X`Yf]gW`j`Y[Ub`[Y`_cW`h`"8]YgYf`?i`fg`[fY]Zh`X]Y`fY`[]cbU`Yb
?i`]bUf]_!HfUX]h]cbYb`Ui`Zi`bX`_ca`V]b]Yfh`X]YgY`a`]h`a`cXYfbYb
j`Y[UbYb`F`YnYd`hYb" `ðhYfYgg]YfhY`_`ÒbbYb`Y`]Yf`YfbYbž`k`]Y`a`Ub
hfUX]h]cbY`Y`Y`; Yf]W`hY`XYf`K`U]X`Yf`?ØW`Y`_fYUh]j`i`bX
dZUb`nYb`VUg]Yfh`bYi`]b`hYfd`fYh]Yfh" `8]Y`J`YfUb`ghU`hYf`gY`Yb`]b
X]YgYf`J`YfV]bXi`b[`b]W`h`bi`f`Y]bYb`HfYbXž`gcbXYfb`Ui`W`Y]bYb
k`]W`h][Yb`GW`f]hž`i`a`bUW`U`h][Y`9fb`Ä`fi`b[gZcfa`Yb`fY[]cbU`ni
ZØfXYfb"

5b[YVchY`ZØf`i`bhYfgW`]YX`]W`Y`N]Y`[fi`ddYb

8Ug`j` \g!GYa`YghYfdfc[fUa`a`k`i`fXY`[Yn]Y`h`gc`[YghU`hYhž`XUgg`Yg
Y]b`VfY]hYg`GdY`_hfi`a`Ub`ðhYfYggYb`i`bX`5`hYfg[fi`ddYb`Ubgdf]W`h`
B`YVYb`XYb`_i`]bUf]gW`Yb`5b[YVchYb`[]Vh`Yg`Ui`W`nU`fY]W`Y

K cf_g\cdg'ZØf'?]bXYf'i bX'đ [YbX`]WXYž'XUfi bhYf'; fi bX_i fgY`]b
?i bghž'A i g]_i bX`HYW.b]_"'8]Y`J c`_g\cW.gW.i `Y`]gh`VYghfYVhž`X]Y
; Ya Y]bgW.UZh`ni `gh`f`_Yb`i bX`; YbYfUh]cbYb
ni gUa a Ybni Vf]b[Ybž`]bXYa `g]Y`]bhYfU_h]j Y`Dfc[fUa a Y`i bX
J YfUbghU`hi b[Yb`ZØfXYfh"

Ni g`Äh`]W`k YfXYb`Ui W`gdYn]Y`Y`?i fgY`ZØf`GYb]cFYb`Ub[YVchYbž
X]Y`g]W`Ui ZH\Ya Yb`k]Y`X][]hU`Y`?ca dYhYbnž
; Ygi bX\Y]hgZØfXYfi b[`i bX`gcn]U`Y`HY`]`UVY`_cbnYbhf]YfYb"'8]YgY
≠]h]Uh]j Yb`n]Y`Yb`XUfUi ZUVž`Ä`hYfYb`A YbgW.Yb`XYb`Ni [Ub[`ni
6]`Xi b[`ni `Yf`Y]W`hYfb`i bX`g]Y`ni `Yfa i h][Ybž`g]W`U_h]j `Ua
[YgY`gW.UZh`]W`Yb`@YVYb`ni `VYhY`]`[Yb"

J \g`U`g`6Y[Y[bi b[ggh`ÄhhY

8]Y`J c`_g\cW.gW.i `Y`: fYmi b[!; fUZYbUi `U`h]g]W`]b`XYb`YhnhYb
≠\fYb`ni bY\`a YbX`U`g`k]W`h][Y`6Y[Y[bi b[ggh`ÄhhY`YhUV`]Yfh"
; YfUXY`]b`Y]bYf`NY]hž`]b`XYf`X]Y`; YgY`gW.UZh`Xi fW`8][]hU`]g]Yfi b[
i bX`gcn]U`Y`≠gc`Uh]cb`<YfUi gZcfXYfi b[Yb`[Y[YbØVYfghY\hž`V]YhYh
X]Y`j \g`Y]bYb`Cfh`XYf`dYfgØb`]W`Yb`6Y[Y[bi b[`i bX`XYg
5i ghUi gW`g"'8]Y`?i fgY`i bX`J YfUbghU`hi b[Yb`X]YbYb`b]W`h`bi f`XYf
: cfhV`]Xi b[ž`gcbXYfb`ZØfXYfb`Ui W`XUg`gcn]U`Y`A]hY]bUbXYf`]b`XYf
FY[]cb"

< YfUi gZcfXYfi b[Yb`i bX`7\ UbW`b`]b`XYf 9fk UW`gYbYbV`]`Xi b[

A]h`6`]W`_Ui ZX]Y`ni _ØbZh][Yb`5bZcfXYfi b[Yb`Ub`X]Y
9fk UW`gYbYbV`]`Xi b[`nY][]h]g]W`ž`XUgg`X]Y`J c`_g\cW.gW.i `Y`]c f
VYXYi hYbXYb`<YfUi gZcfXYfi b[Yb`ghY`h`'8Uni `[Y\ØfYb`X]Y
≠hY[fUh]cb`bYi Yf`HYW`bc`c[]Yb`]b`XYb`l bhYff]W`hž`X]Y`5bdUggi b[
XYf`?i fg]b\U`hY`Ub`X]Y`6YXØfZb]ggY`XYg`5fVY]hga Uf`hYg`i bX`X]Y
: ØfXYfi b[`YVYb`g`Ub[Yb`@YfbYbg"'8]YgY`<YfUi gZcfXYfi b[Yb
k YfXYb`YXcW`Ui W`U`g`7\UbW`b`ZØf`≠bcj Uh]cb`i bX
K Y]hYfYbhk]W`_i b[`XYf`6]`Xi b[gUb[YVchY`[YgY`Yb"

8]Y`j \g`: fYmi b[!; fUZYbUi `d`Ub`h`XU`Yf`Ui W`ž`VYghY`YbXY

Dfc[fUa a Y`_cbh]bi]Yf`]W\`ni `Yj U`i]YfYb`i bX`k Y]hYfni Ybhk]W_Y`b"
: YYXVUW`_j cb`HY]`bY\`a YbXYb`k]fX`U_hj] `ni f`J YfVYggYfi b[`XYf
5b[YVchY`[Ybi hnh`i a `g]W\Yfni ghY``Ybž`XUgg`X]Y`?i fgY`gck c`\`
XYb`6YXØfZb]ggYb`XYf`@YfbYbXYb`U`g`Ui W\`XYb`U_hi Y``Yb
[YgY``gW\UZh`]W\Yb`9bhk]W`_i b[Yb`[YfYW`h`k YfXYb"

8YhU]`g

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