

; cbXY`g\Y]a i bhYf`K UggYf.  
6Øf[ Yfa Y]ghYf`VYgW\ fY]Vh`i bj cfghY`VUfY  
? UhUghfcd\Y

6Øf[ Yfa Y]ghYf`Fi dd`VYf]W\hYh`j cb`j Yf\YYfYbXYb  
, VYfgW\k Ya a i b[ Yb`]b`; cbXY`g\Y]a `bUW\`Yi hfYa Yb  
I bk YhhYfb`Ua `%' "5i [ i gh&\$&( "

≠`XYf`\_Y]bYb`; Ya Y]bXY`; cbXY`g\Y]a `]b`6UXYb!K ØfhYa VYf[  
\UVYb`I bk YhhYf`]b`XYf`BUW\h`ni a `%( "5i [ i ghj Yf\YYfYbXY  
GW\ÅXYb`Ub[ Yf]W\hYh`"8Yf`5i gXfi W\_` <cffcf!BUW\h `VYgW\ fY]Vh  
dUggYbX`X]Y`hfUi a Uh]gW\Yb`9fY][ b]ggYž`X]Y`g]W\`YfY][ bYhYbž`U`g  
g]W\`Xi b`\_Y`K`c`\_Yb`ØVYf`X]Y`F`Y[ ]cb`ni gUa a YbgW\`cggYb`i bX  
g]bhZi hUfh][ Yf`F`Y[ Yb`Y]bgYhnhY`"6Øf[ Yfa Y]ghYf`A Uf`\_i`g`F`i`dd  
gW\`]XYfhY`X]Y`XfUa Uh]gW\Yb`GnYbYbž`X]Y`X]Y`6Øf[ Yf`XYf  
` \$\$\$!9]bk c\`bYf!; Ya Y]bXY`Yf`YVYb`a i gghYb"

5a `5VYbX`XYg`%' "5i [ i ghg`gYhnhYb`\YZh][ Y`; Yk ]hhYf`Y]bž`X]Y  
b]W\h`bi`f`; cbXY`g\Y]a ž`gcbXYfb`Ui W\`UbXYfY`HY]`Y`j`cb  
BcfXf\Y]b!K YghZU`Ybž`B]YXYfgUW\`gYbž`6UmYfb`i bX`6UXYb!  
K ØfhYa VYf[ `]b`A`]hY]XYbgW\UZh`nc[ Yb`"8Yf`F`Y[ Yb`XfUb[ `]b  
?Y`Yf`Y]b`i bX`ØVYfZi hYhY`GhfU»Ybž`gcXUgg`j ]Y`Y`5i hc`g`j`cb`XYf  
Ghf`Òa i b[ `a`]h[ Yf]ggYb`k`i`fXYb`" ≠W\`UVY`gc`Yhk`Ug`]b`), `]X\`fYb  
; cbXY`g\Y]a `bcW\`b]W\h`Yf`YVh ž`gc`F`i`dd`]b`Y]bYa `Ya`ch]cbU`Yb  
: UW\`Vcc`\_!Dcgh`Ua `b`ÅW\`ghYb`A`cf[ Yb"

≠ffYdUfUV`Y`GW\`ÅXYb`i`bX  
[ Ya Y]bgW\`UZh`]W\`Yf`Ni`gUa a Yb\`U`h

8]Y`6]`XYfž`X]Y`Ui`g`; cbXY`g\Y]a `\_Ua`Ybž`nYi [ Yb`j`cb`]a`a`YbgYb  
NYfgh`Òfi b[ Yb`"J]Y`Y`GhfU»Yb`ghUbXYb`i bhYf`K`UggYf`i bX`gU\`Yb  
Ui`g`k`]Y`\_Y]bY`:`ØggY`"F`i`dd`VYa`Yf`\_hYž`XUgg`X]Y`K`UggYfa`UggYb

gck c`X]Y'; fÅVYb`U`g`Ui W`XYb`GUU`VUW`ØVYfZi hYhYbž`k Ug`ni  
Y]bYf`\_ca d`YhhYb` , VYfZi hi b[ `XYf'; Ya Y]bXY`ZØ`fhY""8]Y  
G]hi Uh]cb`k Uf`ZØf`U`Y`5bk c`bYf`U`Ufa ]YfYbX`i bX`gW`cW`\_Y]fYbX  
ni [ `Y]W`ž`XcW`XYf`Ni gUa` a`Yb`U`h`b`XYf`?f]gYbg]hi Uh]cb`k Uf  
VYa`Yf`\_Ybgk`Yfh"

B UW`XYa` `XYf`F`Y[ Yb`b`UW` [ Y`UggYb` \`UhhYž`k Uf`X]Y'; Ya Y]bXY`a` ]h  
XYf`gW`k`YfYb`5i`Z[ UVY`\_cb`Zfc`bh]Yfhž`X]Y`Gdi`fYb`XYg`i`bk`YhhYfg`ni  
VYgY]h[ Yb""8 Ug`F`Uh`Ui`g`f]YZ`X]Y`6Øf[ Yf`X`Uni` `Ui`Zž`g]W`ni  
Yb[ U[ ]YfYb""`K`Ybb`G]Y` \`Y`ZYb`k`c`Ybž`ZfU[ Yb`G]Y`Ua` `VYghYb`]a  
C`fhg`\_Yfb`VY]`XYb`Y]bnY`bYb`<`Åi`gYfb`b`UW`""8]Y`5bk`c`bYf`ZfYi`Yb  
g]W`ØVYf`i`bhYfghØ`hnYbXY`<`ÅbXY`ž`\]Y»`Yg""8]Y`5i`Zf`Åi`a`UfVY]hYb  
VY[ UbbYb`gW`bY`i`bX`i`bVØfc`\_fUh]gW`ž`i`bX`j`]Y`Y`6Øf[ Yf`\_Ua`Yb  
ni`gUa`a`Ybž`i`a`g]W`[ Y[ YbgY]h][ `ni`i`bhYfghØ`hnYb"

6Øf[ Yfa`Y]ghYf`Fi`dd`k`Uf`hf`chn`gY]bYf`Y][ YbYb`gW`k`YfYb  
G]hi Uh]cbž`U`g`Ui`W`gY]b`?Y`Yf`ØVYfZi`hYh`k`i`fXYž`VYfY]hž`ni` \`Y`ZYb"  
`b`XYf`Y`hhYb`Ghi`bXY`V`]YV`bcW`Yhk`Ug`NY]hž`i`a` `a`Y]bY` :`fUi  
VY]a` `F`Y]b][ Yb`i`bX`6Y`ZfY]Yb`j`ca` `K`UggYf`XYg`ØVYfZi`hYhYb  
?Y`Yfg`]a` `F`ØggYbYf`; fi`bX`ni`i`bhYfghØ`hnYb`ž`VYf]W`hYhY`Yf""8]Y`gY  
dYfg`Øb`]W`Y`5b`ghfYb[ i`b[ `nY][ h`XYb`ghUf`\_`Ui`g[ Ydf`Å[ hYb  
; Ya`Y]bgW`UZh`g[ Y]gh`XYf`; cbXY`g`Y]a`Yfž`XYf`]b`Y]bYf  
?f]gYbg]hi Uh]cb`j`cb`[ fc»Yf`6YXYi`hi`b[ `]gh"

## 8]Y`GhY`i`b[ bU`a`Y`XYf`; Ya`Y]bXY`.'9]b 5i`Zfi`Z`ni`f`Gc`]XUf]h`h

8]Y`<`YfUi`gZcfXYfi`b[ Ybž`X]Y`X]Y`6Øf[ Yf`]b`; cbXY`g`Y]a`bi`b  
VYk`Å`h][ Yb`a`ØggYbž`g]bX`Yi`hfYa` ""J]Y`Y` \`UVYb`k`Yfhj`c`Y  
<UVgY`][ \_Y]hYb`j`Yf`cfYb`i`bX`ghY`Yb`j`cf`XYf`5i`Z[ UVYž`]fY  
K`c`bi`b[ Yb`i`bX`]fY`<UVY`k`]YXYf`Yfni`ghY`Yb""8]Y` :`Yi`Yfk`Y`f  
gck`]Y`<`]Zg`f`Å`ZhY`Ui`g`VYb`UW`VUfhYb`; Ya`Y]bXYb`\_`Ua`Yb`gW`bY`  
ni`f`GhY`Yž`i`a` `]b`XYb`gW`k`Yf`VYhf`c`ZYbYb`; YV]YhYb`<`]Z`Y`ni  
`Y]ghYb""6Øf[ Yfa`Y]ghYf`Fi`dd`XUb`\_`hY`U`Yb`9]bgUm`\_`f`Å`ZhYb`i`bX`XYf  
6Yj`Ø`\_Yfi`b[ ž`X]Y`X]Y`G]hi Uh]cb`a` ]hVYk`i`bXYfbgk`YfhYf`Gh`f`\_Y  
UbbU`a`Yb"

9g`k`Uf`i`bVYgW`fY]V`]W`ž`UVYf`Yg`]gh`X]Y`gW`]a`a`Y`F`YU`]h`hž`X]Y

k ]f'bi b '[ Ya Y]bgUa 'VYk Å'h[ Yb'a ØggYb ž'gc 'Fi dd'k Y]hYf" 8 ]YgY  
5i ggU[ Y'gd]Y[ Y'h'XUg'; YZØ\`XYf'8f]b[ `]W\_X]hi bX'XYb'6YXUfZUb  
Ni gUa a Yb\U'h]b'NY]hYb'XYf'Bch'k ]XYf" 8 ]Y'6Øf[ Yf' ]b  
; cbXY`g\Y]a 'g]bX'bi b '[ YZcfXYfhž'b]W'h'bi f'X]Y'X]fY\_hYb'GWÅXYb  
ni 'VY\YVYbž'gcbXYfb'Ui W'Y]b'; YZØ\`XYf'Bcfa U']hÅh  
k ]YXYfni Yf'Ub[ Yb"

9]bY'gc`W\_X'BUhi f\_UhUghfcd\Y'k ]Y'X]YgY '[ ]Vh'XYb'A YbgW\_XYb'X]Y  
A Ø[ `]W\_X]hž'U'g'; Ya Y]bgW\_XUZh'ni gUa a Ybni k UW\_XYb'i bX'g]W\_X  
[ Y[ YbgY]h[ 'ni 'i bhYfghØhYb" '9g']gh'XYf'A ca Ybhž']b'XYa  
BUW\_XVUfb'ni ': fYi bXYb'k YfXYb'\_ØbbYb'i bX'Y]b'ghUf\_Yg'BYhmk Yf\_  
XYf'Gc`XUf]g]Yfi b[ 'YbhghY\Yb'\_Ubb"

## 8 ]Y' < YfUi gZcfXYfi b[ Yb'XYf'B Uhi f'i bX'XUg GhfYVYb'bUW\_X'F Yg]' ]Ybn

BUhi fYfY][ b]ggY'k ]Y'XUg'l bk YhYf' ]b'; cbXY`g\Y]a 'Yf]bbYfb'i bg  
XUfUbž'k ]Y'j Yf'Yh'W\_X'k ]f'g]bXž'i bX'Ui W\_X'k ]Y'YbhgW\_X]XYbX'Yg']ghž  
fYg]' ]Ybh'ni 'V'Y]VYb" '8Yf'Ni gUa a Yb\U'h'XYf'8cfZ[ Ya Y]bgW\_XUZh  
i bX'X]Y'6YfY]hgW\_XUZhž'Y]bUbXYf'ni '\Y'ZYbž'g]bX'YbhgW\_X]XYbX'ZØf  
X]Y' < Y]'i b[ 'i bX'XYb'K ]YXYfUi ZVUi 'bUW\_X'gc`W\_X'gW\_X'k YfYb'NY]hYb"  
9g'V'Y]Vh'ni '\cZZYbž'XUgg'X]Y'A YbgW\_XYb' ]b'; cbXY`g\Y]a 'a ]h'XYf  
l bhYfghØhni b[ 'j cb': fYi bXYb'i bX'BUW\_XVUfb'gW\_XbY''k ]YXYf'Ui Z  
X]Y'6Y]bY'\_ca a Yb'i bX'X]Y'bch'k YbX][ Yb'GW\_Xf]hY'ni a  
K ]YXYfUi ZVUi ']\fYf'; Ya Y]bXY'a Y]ghYfb"

⇒ 'Ni gUa a Yb\Ub[ 'a ]h'XYb'\YZh[ Yb'l bk YhYf' ]b'; cbXY`g\Y]a  
\_Ubb'a Ub'Ui Z'X]Y'Øb[ ghYb'J YfÅbXYfi b[ Yb' ]a ' ? ' ]a U'i bX'XYfYb  
5i gk ]f\_i b[ Yb'Ui Z'YI hfYa Y'K YhYfYfY][ b]ggY'\ ]bk Y]gYb" : ð'XYb  
'YhYb' ð\fnY\bhYb'\UVYb'A YhYcfc`c[ Yb'Y]bYb'5bgh]Y[ 'j cb  
9l hfYa k YhYfYfY][ b]ggYb'fY[ ]ghf]Yfhž'k Ug'a ]h'XYb'ghY][ YbXYb  
HYa dYfUhi fYb'i bX'j YfÅbXYfhYb'\_ ]a Uh]gW\_XYb'6YX]b[ i b[ Yb' ]b  
J YfV]bXi b[ '[ YVfUW\_X'h'k ]fX" @Ui h'XYa '8Yi hgW\_XYb'K YhYfX]Yb gh  
\Uh'g]W\_X]Y'5bnU\`XYf'GhUf\_fY[ YbYfY][ b]ggY' ]b'8Yi hgW\_X'UbX' ]b  
XYb''YhYb' ( \$ ð\ fYb'j YfXcddY'h" 8 ]YgY'K YhYfYI hfYa Y'ghY''Yb  
Y]bY' ]a a Yf' [ fØ» YfY' < YfUi gZcfXYfi b[ 'ZØf' ? ca a i bYb'i bX'X]Y  
⇒ ZfUghfi \_hi f'XUf"

## 8 ]Y`J cfVYfY]hi b[ `Ui Z`B Uhi f\_UhUghfcd\Yb

5b[ Yg]W\hg`gc`W\Yf`i bk YhhYf`k ]fX`Yg`ni bY`a YbX`k ]W\h][ žXUgg  
; Ya Y]bXYb`i bX`Gh`XhY`UX`Åei UhY`BchZU`d`ÅbY`Yb`hk ]W\_Y`bž`i a  
g]W\`Ui Z`gc`W\Y`B Uhi f\_UhUghfcd\Yb`j cfni VYfY]hYb`" `⊕  
; cbXY`g\Y]a `a U[ `X]Y`⊕ZfUghfi \_hi f`VY]`X]YgYb`, VYfZi hi b[ Yb  
ØVYfZcfXYfh`[ Yk YgYb`gY]b/UbXYfY`Gh`XhY`\UVYb`VYfY]hg  
dfÅj Ybh]j Y`A U» bU`a Yb`Yf[ f]ZZYb`"@Ui h`Y]bYa `6Yf]W\h`XYf`  
**6i bXYga ]b]ghYf]i a g`ZØf`i a k Y`hž`B Uhi fgW\i hn`i bX  
bi \_`YUfY`G]W\Yf\Y]h`UfVY]hYb`j ]Y`Y`;** Ya Y]bXYb`XUfUbž  
FY[ Ybk UggYfVYk ]fhgW\UZh`i b[ ga U» bU`a Yb`ni`j YfVYggYfb`i bX  
a cXYfb]g]YfhY`9b`hk ÅggYfi b[ ggmghYa Y`ni`ja d`Ya Ybh]YfYbž`i a  
XUg`F]g]\_c`j cb`, VYfgW\k Ya a i b[ Yb`ni`fYXi n]YfYb`"

Ni XYa`k ]fX`X]Y`GYbg]V`]g]Yfi b[ `XYf`6Yj Ø`\_Yfi b[ `ZØf`gc`W\Y  
K YhhYfd\`Åbca YbY`ja a Yf`k ]W\h][ Yf`5i Z`\_Åfi b[ gdfc[ fUa a Yž`X]Y  
ØVYf`a Ø[ `]W\Y`BchZU`a U» bU`a Yb`]bZcfa ]YfYb`i bX`XUg  
6Yk i gghgY]b`ZØf`X]Y`; YZU`fYb`j cb`9l hfYa k YhhYf`Yf\Ø`Ybž  
\_ØbbYb`XUni`VY]hfU[ Ybž`GW`ÅXYb`ni`a ]b]a ]YfYb`i bX`X]Y  
FYU\_`h]cbgZ`Å][ \_Y]h`XYf`6Øf[ Yf`ni`gh`Åf`\_Yb`" `⊕; cbXY`g\Y]a  
VY]gd]Y`gk Y]gY [ UV`XYf`6Øf[ Yfa Y]ghYf`< ]bk Y]gY`ni f  
l bhYfghØhni b[ `XYf`6Yhfc ZYbYbž`k Ug`nY][ hž`XUgg`X]Y  
; Ya Y]bgW\UZh`]b`gW\k ]Yf][ Yb`NY]hYb`ni gUa a YbUfVY]hYb`\_Ubb`"

## 2 ZZYbh`]W\Y`F YU\_h]cbYb`i bX`< ]`ZgUb [ YVc hY

8 ]Y`ØZZYbh`]W\Y`F YU\_h]cb`Ui ZX]Y`i bk YhhYf\_UhUghfcd\Y`]b  
; cbXY`g\Y]a `k Uf`XYi h]W\`" `⊕`Gcn]U`Yb`A YX]Yb`f]YZYb`j ]Y`Y  
A YbgW\Yb`ni`i bhYfghØhni b[ `Ui Z`"@c\_U`Y`C f[ Ub]gUh]cbYb`i bX  
: fY]k ]`][ Y`nc[ Yb`gW`bY`"]b`XYb`? UhUghfcd\Yb[ YV]YhYb`i a `Yfž  
i a `XYb`6Yhfc ZYbYb`ni`\_Y`ZYb`" `Gc`W\Y`gdcbhUbYb  
FYhhi b[ gU\_h]cbYb`g]bX`]b`XYf`; YgW\]W\hY`XYi hgW\Yb  
? UhUghfcd\YbgW\i hnYg`\Åi Z[ `Xc`\_i a Ybh]Yfh`**8 Ug`8 Yi hgW\Y  
F chY`? fYi n`VY]gd]Y`gk Y]gY`\_Uh]a`? UhUghfcd\YbZU`" ghYhg`Y]bY  
k ]W\h][ Y`F c`\_Y`[ Ygd]Y`hž]bXYa`Yg`b]W\h`bi f`< ]`ZY`\_Y]ghYhž`gc bXYfb  
Ui W`X]Y`bchk YbX][ Yb`FYggci fW`b`a cV`]g]Yfhž`i a `VYhfc ZYbYb  
; YV]YhYb`fUgW`i bhYfghØhni b[ `ni`\_ca a Yb`ni`\_UggYb`"**

8]Y`l bhYfghØhmi b[ `j cb`<]`Zgcf[ Ub]gUh]cbYb`]ghj cb`k YgYbh`]WXYf  
6YXYi hi b[ ži a `X]Y`VYhfcZYbYb`A YbgWXYb`]b`; cbXY`g\Y]a  
k ]YXYf`]b`]fY`Bcfa U`]hÀh`ni fØW\_ni ZØ`fYb``9g`]gh`k ]W]h[ ž`XUgg`XYf  
: c\_i g`b]W`h`bi f`Ui Z`XYf`GcZc`fh\`]ZY``]Y[ hž`gcbXYfb`Ui W`Ui Z`XYf  
`Ub[ Zf]gh[ ]Yb`l bhYfghØhmi b[ ž`XU`j ]Y`Y`bUW`k ]Yj cf`a ]h`XYb`: c`[ Yb  
XYf`\_ VYfgW`k Ya a i b[ Yb`ni ` \_Àa dZYb`\UVYb`k YfXYb``9]bY  
\_ccfX]b]YfhY`5bhk cfh`Ui Z`gc`W`Y`B`Uhi f\_UhUghfcd\Yb`ZØfXYfh`b]W`h  
bi f`XYb`k ]YXYfUi Z`Ui ž`gcbXYfb`\_ØbbhY`Ui W`ni \_ØbZh[ Y  
? UhUghfcd\Yba UbU[ Ya YbhghfUhY[ ]Yb`XYf`; Ya Y]bXY`j YfVYggYfb`

8YhU]`g

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