

## HfcW\_YbghYf`C fh`XYf`9fXY. `6Ygi W\ `XYf 5hUWJa U!K ØghY `]b `7\ `]Y

8]Y`5hUWJa U!K ØghY`]gh`XYf`hfcW\_YbghY`C fh`XYf`9fXY`i bX  
a Ò[ `]W\Yfk Y]gY`X]Y`À`hYghY`K ØghY`XYf`K Y`h`K ]f  
i bhYfbY\`a Yb`Y]bY`" \$`\_a ``Ub[ Y`F UXhci f`Xi fW\`X]Y  
XfUa Uh]gW\Y`@UbXgW\UZhI bgYfY`F Y]gY`bUW\`5hUWJa U`k Uf  
j ]Y``\_ca`d`n]YfhYf`U`g`Yfk UfhYh`6]g`ni `X]YgYa `NY]hdi b`h  
k UfYb`X]Y`; fYbnØVYf[ Àb[ Y`Ui Zi bgYfYf`F Y]gY`fY`Uh]j  
i b`ca`d`n]Yfhž`gcXUgg`k ]f`ØVYffUgW\h`k UfYbž`XUgg`Yg`\_Y]bYb  
X]fY`\_hYb`K Y[ `j`cb`l`mi`b`]b`6c`j] ]Yb`bUW\`5hUWJa U`]b`7\`]Y  
[ UV``5bghUhh`Y]bYb`6i`g`ni `bY\`a Ybž`a i`gghYb`k ]f`Y]bYb  
HfUbgZYf`j`cb`) \$`I`G8`Vi`W\Ybž`Y]bY`BUW\h`]b`Y]bYa`N]a`a`Yf`j`YfVf]b[ Ybž`XUg`ZUgh[ YbUi`k ]Y`Y]bY`; YZ`Àb[ b]gnY``Y`Ui`ggU\`ž`  
XYb`HfUbgZYf`ni`f`; fYbnY`bY\`a Ybž`k`Y]hYfY`&\$`I`G8`ZØf`  
/`Ua`d`^Y``]d/

8]Y`5hUWJa U!K ØghY`]gh`XYf`hfcW\_YbghY`C fh`XYf`9fXY`i bX  
a Ò[ `]W\Yfk Y]gY`X]Y`À`hYghY`K ØghY`XYf`K Y`h`K ]f`i`bhYfbY\`a`Yb  
Y]bY`" \$`\_a ``Ub[ Y`F UXhci f`Xi fW\`X]Y`XfUa Uh]gW\Y`@UbXgW\UZh

I`bgYfY`F Y]gY`bUW\`5hUWJa U`k Uf`j ]Y``\_ca`d`n]YfhYf`U`g`Yfk UfhYh`  
6]g`ni `X]YgYa `NY]hdi b`h`k UfYb`X]Y`; fYbnØVYf[ Àb[ Y`Ui Zi bgYfYf`  
F Y]gY`fY`Uh]j`i`b`ca`d`n]Yfhž`gcXUgg`k ]f`ØVYffUgW\h`k UfYbž`XUgg`  
Yg`\_Y]bYb`X]fY`\_hYb`K Y[ `j`cb`l`mi`b`]b`6c`j] ]Yb`bUW\`5hUWJa U`]b`  
7\`]Y`[ UV``

5bghUhh`Y]bYb`6i`g`ni `bY\`a Ybž`a i`gghYb`k ]f`Y]bYb`HfUbgZYf`j`cb  
) \$`I`G8`Vi`W\Ybž`Y]bY`BUW\h`]b`Y]bYa`N]a`a`Yf`j`YfVf]b[ Ybž`XUg`  
ZUgh[ YbUi`k ]Y`Y]bY`; YZ`Àb[ b]gnY``Y`Ui`ggU\`ž`XYb`HfUbgZYf`ni`f`  
; fYbnY`bY\`a Ybž`k`Y]hYfY`&\$`I`G8`ZØf`XYb`9]bhf]h`]b`XYb  
BUh]cbU`dUf`\_nU\`Yb`i`bX`XUbb`Y]bYb`k`Y]hYfYb`HfUbgZYf`bY\`a`Yb  
Ui`ZXYf`UbXYfYb`GY]hY``5``Yg`]b`U``Ya`XUi`YfhY`Y]bY`; U\`fhž`X]Y`]b  
bYi`b`Ghi`bXYb`ni`fØW\_[ Y`Y[ `h`k`YfXYb`\_Ub`bž`ghUhh`XYggYb`Yhk`U`&(

Ghi bXYb"

5`g`k ]f`b`GUb`DYXfc`XY`5hUWJa U`Ub\_Ua Ybž`gi a a hYb`k ]f`j cf  
: fYi XY" `9bX`]WŁž`bUWŁ`6c`j ]Ybg`i bYfV]h`h]WŁ Yf`?`À`h`i`bX  
i bYfV]h`h]WŁ Yf`<`Ò\`Yž`\_cbbhYb`k ]f`bi b`i b[ YnØ[ Y`hYb  
GcbbYbgWŁY]b`i bX`K`Àfa Y`[ Yb]Y»Yb" `l bgYf`i: U`fYf`XfY`hY`g]WŁ`ni  
i bg`i a`i bX`[ f]bghY" `A ½g`VU`cž`a ½g`WU`]YbhY ž`gU[ hY`Yf" `b`XYf  
HUh`b]YXf][ Yf`i bX`\Y]»Yf"

- `U`h1 hfcW\_YbghYf`C fh`XYf`9fXY 2
- `U`h1 2
- `U`h1 2
- `U`h1 2
- `U`h1 hfcW\_YbghYf`C fh`XYf`9fXY 2
- `U`h1 GU`n`Ua` hfcW\_YbghYb`C fh`XYf`9fXY 2
- `U`h1 <`Ò\`YbZc fgWŁi b[ `Ua` hfcW\_YbghYb`C fh`XYf`9fXY 2
- `U`h1 DY`hYf`Ua` hfcW\_YbghYb`C fh`XYf`9fXY 2
- `U`h1 \_]U`Ua` hfcW\_YbghYb`c fh`XYf`YfXY 2
- `U`h1 5hUWJa U`V]YhYh`Y]bY`XYf`VYghYb`Ci hXccf!  
5\_hj] ]h`hYb`]b`7`\]Y 2
- `U`h1 <]hnYYfgWŁ`ÒdZ` b[ `j`Yfa`Y]XYb 2
- `U`h1 2

8]Y`5hUWJa U!K` ØghY`]gh`b]WŁ`h`bi f`\Yff`]WŁ`b]YXf][ ž`\Y]»`i`bX  
hfcW\_Ybž`g]Y`]gh`gc[ Uf`XYf`hfcW\_YbghY`C fh`XYf`9fXY" `8]YgYf`%"`\$\$\$  
\_a`f\*`\$\$`A`Y]`YbŁ`Ub[ Y`@UbXghfY]ZYb`Ybh`Ub[ `XYf  
gØXUa`Yf]\_Ub]gWŁYb`DUn]Z]\_\_ØghY`Z`À`h`a` `8i`fWŁ`gWŁ`b]h`Y`hk`U`%)  
a`a`f`\$`ž`\*`Nc```Ł`B]YXYfgWŁ`U[ `d`f`c``š`U`f`f]a` `J`Yf[ `Y]WŁ`ni`%`\$`\*`a`a  
f( ž&`Nc```Ł`]b`@Ug`J`Y[ UgŁ"

⇒a`nYbhU`Yb`GY`\_hc`f`k`i`fXYb`DYf]cXYb`j`cb`j`]Yf`š`U`fYb`c`\bY  
B]YXYfgWŁ`U[ `fY[ ]ghf]Yfhž`i`bX`Y]b][ Y`K`Y`h`Y`f`gh`U]cbYb`\UVYb  
ØVYf\Ui`dh`bc`WŁ`b]Y`F`Y[ Yb`VY`\_ca`a`Yb" `J]Y`Y`gY]bYf`6Yf[ Y`ØVYf

\*"\$\$\$'a'g]bX'j Ö`][ '[`YhgWkYfZfY]ž'Y]b'6Yk'Y]g'ZØf'X]Y'YI hfYa'Y  
HfcW\_Yb\Y]h'XYf'F'Y[ ]cb"'8UfØVYf'\]bUi'g'XYi'hYb'H\Ycf]Yb'XUfUi'Z  
\]bž'XUgg'5hUWUa'U'X]Y'À'hYghY'K'ØghY'XYf'K'Y'h']gh"'8Ug'a'igghYb  
k]f'i'bg'bUhØf']Wk'UbgWk'Ui'Yb"

K]f'\UVYb'i'bg]a'<chY''HU\_\U'HU\_\U'b]YXYf[ Y'UggYbž'Y]bYa  
A]hhY'\_UggY\chY'a' ]h'Y]bYa' \ØVgWkYbž'j'cb'6Ài'a'Yb  
UV[ YgWk]fa'hYb'7Ua'd]b[ 'd'Uhn"'8]Y'GhUXh'GUb'DYXfc']gh'\_Y]b'i'bX  
WkUfa'Ub'h'a' ]h'Y]bghÖW\_] [ Yb'@Y\ a' \Ài'gYfbž'i'b[ YdZUghYfhYb  
GhfU»Yb'i'bX'Y]bYf'UbghÅbX][ Yb'5i'gk'U\''Ub'7UZÅg'i'bX  
F'YghUi'fUbhg"'9g'[ ]Vh'Y]bY'[ fc»Y'5i'gk'U\''Ub'F'Y]gYj'YfUbghU'hYfbž  
UVYf'k]f'\UVYb'i'bg'YbhgWk]YXYbž': U\ffÅXYf'ni'a' ]YhYb'i'bX  
U'Y]bY'ni'ZU\fyb"

5a'YfghYb'HU[ 'VYgi'Wk'hYb'k]f'XUg'J'U''Y'XY''U'A'i'YfhYž'k'Ug'a' ]f  
NY]h[ 'UVž'XUg'F'UXZU\fyb' ]b'XYf' ]bhYbg]j'Yb'K'ØghYb\]hY'ni'ØVYb"  
fl'Øf'X]Y'Yb][ Ybž'X]Y'Yg'b]Wk'h'k' ]ggYbž']Wk'\UVY'Yfgh'\_Øfn']Wk'XUg  
F'Y]hYb' [ Y'Yfbh"Ł

' '\_a' ]cb'GUb'DYXfc'Yb'hZYfbhž'VYghY'h'XUg'J'U''Y'XY''U'A'i'YfhY'Ui'g  
ZUgn]b]YfYbXYb'fchYb': Y'gZcfa'Uh]cbYbž'X]Y'XUfUb'Yf]bbYfb  
Hi'f\_Ymg'?UddUXc\_]Yb'gck' ]Y'Y]bY'F'Y]\Y'j'cb'Yb[ Yb'GWk'i'Wk'hYb  
i'bX'%) '\$'a' \c\Yb'GUbXXØbYb"'K' ]f'j'YfvfUWk'hYb'XYb'HU[ 'a' ]h  
F'UXZU\fybž'? 'YhhYfb'i'bX'VYcVUWk'hYhYbž'k' ]Y'GUbXVcUfXYf  
j'Yfgi'Wk'hYbž'Ui'ZfYWk'h'ni'V'Y]VYbž'k'Å\fybX'g]Y'X]Y'8ØbYb  
\]bi'bhYfZc[ Yb"

8Yf'bÅWkghY'HU[ 'VY[ Ubb'a' ]h'Y]bYf'8YVUhhY.'GWk'UZY' ]Wk'X]Y'&  
\_a' < ]b!'i'bX'F'ØW\_ZU\fh'bUWk'J'U''Y'XY''U'@'bU'i'bX'ni'fØW\_3'K' ]Y  
]Wk' ]b'%) 'j'YffØW\_hYb'GhfU»Yb'Ui'ZXYf[ 'UbnYb'K'Y'h'gU[ hYž'\Uh  
DYhYf'a' ]Wk' ]a'@Ui'ZY'XYf''YhhYb'gYWk'g'A'cbUhY'a'Y\fa'U'g'j'ca  
: U\ffUX'ZU''Yb'gY\Yb'i'bX' ]gh' ]a'a'Yf'j'cfg]Wk'h][ ž'k'Ybb' ]Wk'  
j'cfgWk'U[ Yž'XUgg' ]Wk'ØVYf'a'Y]bY': Å\][ \_Y]hYb'\]bUi'g'ZU\fy"

K]f'ZfU[ hYb'a'Y\fyfy'9]b\Y]a' ]gWk'Y'bUWk'XYf'GhfU»Y'ni'a' 'HU''i'bX  
YfZ' \fybž'XUgg'Y]b': fc»hY]'XUj'cb'ZUWk' ]ghž'g]Wk'UVYf' ]a' ðbYfYb  
XYg'?ca'd'YI'Yg'ghY]'ni'k'Y''Yb'VY[ ]bbh"'K' ]f'ZUgghYb'A'i'hi'bX  
VYgWk'cggYbž'Yg'ni'j'Yfgi'Wk'Yb"

K JY VYZ0fW hYhZ VY [ Ubb X]Y GhfU» Y'a ]W \YfUi gni ZcfXYfbž U`g`k Jf XYb`Y][ Ybh]WXYb`?ca d`YI` VYhfUHYb" BUW`Y]bYf`Ghi bXY`a i gghY ]W`DYhYf`gU[ YbžYf`gc`Y`c\ bY`a ]W`k Y]hYfZU\ fYbž`XU`]W`X]Y gYb[ YbXY`<]hY`i bX`X]Y`ghY`Yb`5bgh]Y[ Y`k ]f`\_]W`b]W`h`Y`fhfU[ Yb`\_cbbhY"

W`j Yfgi W`hYž`\a`bUW`ni`Ui ZYbž`UVYf`Yg`[ ]b[ `bi`f`gY\`f`Ub[ gUa j`cfUb" BUW`Y`hk`U" \$`A ]bi`hYb`\_Y\`fhY`Yf`UhYa`cg`i bX`YfgW`OdZh ni`f0W`"K ]f`VYgW`cggYbž`Z0f`i bgYf`@ bW`dU`Yh`Ubni`U`hYb`i bX`XUbb`Y]bY`bU\Y`[ Y`Y[ YbY`<0\`Y`]b`5b[ f]Z`ni`bY\`a`Yb"

Ni`a` ;`0W`\_`UVY`]W`a`Y]bYb` :`U\`ffUX\`Y`a``a` ]h[ Ybca`a`Yb`/`9g`\`Uh a` ]f[ i`hY`8]YbghY`[ Y`Y]ghYhž`U`g`]W`Xi`fW`X]Y`Yb[ Yb`GhY`Yb`i bX`b]YXf][ Yb`8YW`\_Yb`XYf`<0\`Y`bUj ] [ ]YfhY" BUW`%)`A ]bi`hYb`hUi`W`hYb`k ]f`]b`Y]bYf`XfUa`Uh]gW`Yb`@UbXgW`UZh`Ui`Z`X]Y`b]W`h`a` ]h`GW`bYYž`gcbXYfb`a` ]h`GU`n`VYXYW`\_h`k`Uf"K ]f`\`UVYb`Y]bYb`\`U`VYb`@]hYf`K`UggYf`[ Yhf`i`b`\_Yb`i bX`k`Å\`fYbX`k ]f`Xcfh`Ui`Z`Y]bYa`fchYb` :`Y`gYb`a` ]hYb`]a`hfcW`\_YbghYb`C`fh`XYf`9fXY`[ YVUW`\_Yb`\`UVYbž`\`UVYb`k ]f`[ YhUbž`k`Ug`k ]f`b]Y`Z0f`a`0[ `]W`[ Y\`U`hYb`\`ÅhYb.`i`bg`bUW`X`Yf`?`Å`hY`6c`j ]Ybg`gY\`bYb"

## HfcW`\_YbghYf`C`fh`XYf`9fXY. `H\`Y`9ggYb`h]U`g`

K`Ug.`Nk`Y]` VYfbUW`hi`b[ Yb`]b`GUb`DYXfc`XY`5hUWJa`Už`XYa`Hcf`ni`f`5hUWJa`U!K`0ghYž`XYa`hfcW`\_YbghYb`C`fh`XYf`9fXY"K ]f`a` ]YhYhYb` :`U\`ff`ÅXYf`i`bX`Z`\`fYb`Ua`YfghYb`HU[ `bUW`J`U`Y`XY`U`A`i`YfhY`f9]bhf]hh`ZfY]ž" `\_a`j`cb`XYf`GhUXh`Yb`hZYfb`h`i`bX`Ua`nk`Y]hYb`HU[ bUW`J`U`Y`XY`U`@`bU`fl`I`G8`dfc`DYfgcbž`%( `\_a`j`cb`XYf`GhUXh`Yb`hZYfb`h`"

G]Y`\_0bbYb`\]Yf`Y]W`h`Y]bY`K`cW`Y`a` ]h`UbXYfYb`Hcd! GY\`Yb`gk`0fX][`\_Y]hYb`Z0`Ybž`XUfi`bhYf`GU`Uf`XY`5hUWJa`U`f7\`]Yg`[`f0»`hY`GU`nd`ZUbbYž`9`HU]c!;`Ymg]fY`fGdi`W`\_Yb`j`cb`\`Y]»`Ya`K`UggYf`i`bX`@U[`i`bUg`A`]gW`Ub]h`i`bX`A`]i`]ei`Yg`fgW`]a`a`YfbXY`6YW`\_Yb`a` ]h`h]Y`ZV`Ui`Ya`K`UggYfž`X]Y`j`cb`k`Y]»`Yb`GU`n`V`Å`bXYfb`i`a`[`YVYb`g]bX`L`L`"

K`c.`GUb`DYXfc`XY`5hUWJa`U"K ]f`0VYfbUW`hYhYb`]a`<`chY`HU`\_`U`

HU\_\Už'XUg'ØVYf'Y]bYb'WUfa UbhYb'7Ua d]b[ d`Uhn'a ]h'k Ufa Yb  
8i gWYb'i bX'i `hfUgUi VYfYb'9]bf]W hi b[ Yb'j YfZØ[ h'f%, 'l G8'dfc  
DYfgcb'i bX'BUW hē"9]bn][ Yg'A Ub\_c'i]gh'XYf'ZY\`YbXY'Ni [ Ub[ 'ni f  
?ØWY"K ]f'\UVYb'i bg'XUa ]h'UV[ YZi bXYbž'HcdZbi XY'b'a ]h  
\Y]»Ya 'K UggYf'Ui g'XYf'?UZZYYa UgW]bY'Ub'XYf'FYnYdh]cb  
Ui Zni hUi Yb"

K Ubb. '8U'X]Yg'XYf'hfcW\_YbghY'C fh'XYf'9fXY ]ghž'ÀbXYfh'g]W'XUg  
K YhhYf'gY'hYb'j cb'A cbUhini 'A cbUh"6Ygi WYb'G]Y'ja 'ž b]XUg  
Øfh]WY': Yghini a '<Y']][ Yb'HU[ 'cXYf'ja 'ž ']'X]Y'\_Ø\`YfYb'BAW hY"

K ]Y. 'Cmj Ym"K Ybb'G]Y'j cb'l mi b]\_ca a Ybž'k ]fX'Yg'b]W h  
Y]bZUW" 'G]Y'\_ØbbYb'Yb'k YXYf'k ]Y'cVYb'VYgWf]YVYb'Y]bYb  
HfUbgZYf'j cb'' ) 'l G8'bY\`a Yb'fMY]b\U'hYh'Y]bY', VYfbUW hi b[ 'j]b  
Y]bYa '[ YZ'Ab[ b]g'À\`b']WYb'N]a a Yfž[ YZc`[ hij cb'Y]bYf  
ni g'Àhn']WYb'; YVØ\`f'j cb'&\$'l G8'ZØf'XYb'9]bhf]h'h]b'XYb  
BUh]cbU`dUf\_Ł'cXYf'Y]bYb'6i g'bY\`a Ybž'XYf'XYb'5i ZYbh\U'hj cb  
Y]bYf'BUW hi bX'X]Y'; YVØ\`f'j Yfa Y]XYh"ZÀ\fh'UVYf'i a 'j ]Yf'l \f  
a cf[ Ybg'UV"

K YbXYb'G]Y'g]W'Ub'7cfX]`YfU'Hci fgž'i a 'ÀfYb'D`Uhn'ni 'Vi WYb  
f]b'XYf'BA\Y'XYg'<chY`g'ž `]U'Ub'XYf'5j Yb]XU': Yffcj ]Uf]U']b  
l mi b]ē"5'hYfbU'hj ]\_ØbbYb'G]Y'j cb'GUbh]U[ c'bUW'7U'Ua U'Z]Y[ Yb"  
6i WYb'G]Y': `Ø[ Y'ØVYf'g\_mgWUbbYf"bYh"

J cb'7U'Ua U'Ui g'\_ØbbYb'G]Y'Y]bYb'6i g'Vi WYb'fMU"') 'l G8ž  
j Yfgi WYb'G]Y'Yg'a ]h'Hi f'6i g'łž'Y]bYb'G\i h'h'Y'bY\`a Yb'fMU"`,  
l G8žj Yfgi WYb'G]Y'Yg'a ]h'@]WUbwUvi fŁ'cXYf'Y]b'hYi fYfYg'HUI ]  
bY\`a Yb'fY'bUW'NY]h'ink ]gWYb'&) 'i bX'' ) 'l G8Ł"8]Y': U\fh]gh  
%\$\$\_a 'Ub[ 'i bX'XUi Yfh'Yhk U' - \$'A ]bi hYb"

@Y]hV]`X. 5h'Ug/ '6cchg

6Ygi W\Yb`G]Y`i bg`Ui Z.`Y]bY!fY]gY"XY