

? Øb gh`Yf]gWXY`DUi gY. `A Uf]i g`A Ø`Yf!  
K YghYfb\U[ Yb`gU[ h`k Y]hYfY`? c bnYfhY`UV

A Uf]i g`A Ø`Yf!K YghYfb\U[ Yb`gU[ h`? c bnYfhY`]b`8 fYgXYb`i bX  
<U`Y`UV"; fi bX`]gh`Y]b`\Ufhb`ÄW\_][ Yf`bZY`\_h`K Y]hYfY`8 YhU]`g  
]a`5fh`\_Y`"

Gcf[ Y`i a`X]Y`; Ygi bX\Y]h`XYg`VY`]YVhYb`GÄb[ Yfg`A Uf]i g`A Ø`Yf!  
K YghYfb\U[ Yb`"8 Yf`+) !`Ä\][ Y`? Øb gh`Yf`\_Äa`dZh`k Y]hYf\]b`a`]h`XYb  
: c`[ Yb`Y]bYg`\Ufhb`ÄW\_][ Yb`bZY`\_hg`ž`k Ug`bi b`XUni`ZØ\fh`ž`XUgg  
k Y]hYfY`5i Zhf]hY`UV[ YgU[ h`k YfXYb`a`ØggYb`"Ni`j cf`\UhhY`Yf  
VYfY]hg`? c bnYfhY`]b`A`ØbWXYb[ `UXVUW`i bX`7cVi`f[ `UVgU[ Yb  
a`ØggYb`ž`i bX`bi b`hf]Zh`Yg`Ui W`X]Y`; Ubg`]b`8 fYgXYb`i bX`<U`Y`"

YfnhY`\UVYb`XYa`GÄb[ Yf`[ YfUhYb`ž`g]W`Ui gfY]WXYbX`ni`gW`cbYb`  
5i Z[ fi bX`X]YgYg`[ Ygi bX\Y]h`WXYb`DfcV`Ya`g`k`i`fXYb`X]Y`ZØf`XYb  
&(`"5i [ i gh]b`8 fYgXYb`i bX`XYb`&+"`5i [ i gh]b`<U`Y`#GUU`Y  
[ Yd`UbhYb`? c bnYfhY`YVYbZU`g`[ Yghf]WXYb`"8]Y`5VgU[ Y`k`i`fXY`ØVYf  
Y]bYb`cZZ]n]Y`Yb`b`ghU[ fUa`!Dcgh`\_ca`a`i`b]n]Yfh`ž]b`XYa`X]Y`; Ubg  
i`a`J Yfgh`ÄbXb]g`[ YVYhYb`k`YfXYb`"

## 8 Yf`9]bZ`i gg`Ui Z`X]Y`Hci fbYY

8]Y`5VgU[ Yb`ghY`Yb`Y]bY`Yf\YV`]WXY`i bhYfVfYW`i b[ `gY]bYf  
Hci fbYY`XUf`"A`Ø`Yf!K YghYfb\U[ Yb`ž`VY`\_Ubbh`ZØf`gY]bY  
Y]bXfi`W\_gj`c`Yb`i bX`YbYf[ ]Y[ Y`UXYbYb`5i Zhf]hY`ž`\Uh`g]W`]b`XYb  
`YhnhYb`K`cWXYb`Ui`ZY]bY`i`a`ZUggYbXY`F`ØW`\_Y`f`ni`f`6Ø`bY  
j`cfVYfY]hYh`"GY]bY`? c bnYfhY`n]Y`Yb`[ Yk`Ø`b`]W`Y]bY`[ fc`»`Y  
5bnU`l`j`cb`: Ubg`Ub`ž`X]Y`XYb`5i`gbU`a`Y`\_Øbgh`Yf`"j`Y`Yf`YVYb  
a`ØW`hYb`"8]YgY`a`YX]n]b]gWXYb`DfcV`Ya`Y`k`YfZYb`Y`XcW`: fU[ Yb  
ØVYf`XYb`k`Y]hYfYb`J`Yf`Ui`Z`gY]bYf`Hci`fbYY`Ui`Z`"

8]Y': Ubg'nY][ Yb'g]W\ VYgcf[ h'i bX'k ØbgW\Yb'XYa 'GÅb[ Yf'Y]bY  
[ i hY'; YbYgi b[ "8]Y'A Y'Xi b[ Yb'ØVYf'gY]bY'5i gZÅ''Y'YffY]W\Yb'g]Y  
ØVYf'gcn]U'Y'A YX]Ybž'k Ug'j YfXYi h']W\hž'k ]Y'gY\ f'XUg'dYfgØb'W\Y  
9b[ U[ Ya Yb'h'XYg'? Øbgh'Yfg'[ YgW\Åhnh'k ]fX'' ð'NY]hYbž']b'XYbYb  
X]fY\_hY' ð'hYfU\_h]cb'i bX'J YfV]bXi b[ 'ØVYf'X][ ]hU'Y'D'UhZcfa Yb'gc  
k ]W\h][ ' [ Yk cfXYb'g]bXž']gh'Y]bY'gc'W\Y'B UW\ f]W\h]a a Yf'Y]b  
Ya ch]cbU'Yf'F ØW\_gW\`U[ ''

## 8]Y'F Y`Yj Ubn'XYf'5VgU[ Yb

8]Y'5VgU[ Y'XYf'?cbnYfhY'']gh'b]W\h'bi f'Y]bY'a YX]n]b]gW\Y  
5b[ Y'Y[ Yb\Y]hž'gcbXYfb'gd]Y[ Y'h'Ui W\`X]Y'<YfUi gZcfXYfi b[ Yb  
k ]XYfž'a ]h'XYbYb'? Øbgh'Yf'']b'XYf'\Yi h][ Yb'NY]h'\_cbZfcbh]Yfh'g]bX"  
; Ygi bX\Y]hgdZY[ Y'\Uh'J cffUb[ ž'i bX'Yg'k ]fX'XYi h']W\ž'XUgg'Ui W\  
VY\_UbbhY'i bX'YfZU\ fYbY'A i g]\_Yf''Ub[ Zf]gh][ Y'5i gk ]f\_i b[ Yb'j cb  
'fUb\_\Y]hYb'Yf'YVYb'\_ØbbYb''8]Y'5bcfXbi b[ 'ni f'5VgU[ Y'XYf  
G\ck g'\YVh'\Yfj cfž'k ]Y'k ]W\h][ 'Yg']ghž'Ui Z'X]Y'Y][ YbYb  
\_ØfdYf']W\Yb'6YXØfZb]ggY'ni '\ØfYbž'VYgcbXYfg']b'Y]bYf'6fUbW\Yž  
X]Y'cZi\c\Y'9fk Ufhi b[ Yb'gYhnh"

A Uf]i g'A Ø`Yf!K YghYfb\U[ Yb']gh'Y]bY'nYbhfU'Y': ][ i f']b'XYf  
XYi hgW\Yb'A i g]\_gnYbY'i bX'\Uh'ØVYf'X]Y' ð\ fY'Y]bYb'V'Y]VYbXYb  
9]bXfi W\_\]bhYf'UggYb''GY]bY'@]YXYf'\UbXY'b'cZij cb'h]YZb  
9a ch]cbYb'i bX'dYfgØb'W\Yb'? Åa dZYbž'k Ug'g]W\Yf'Ui W\`XUni  
VY]hfÅ[ hž'XUgg': Ubg'g]W\`a ]h']\a 'j YfVi bXYb'ZØ\`Yb''GY]b  
U\_hi Y``Yf'Ni ghUbX'Yf]bbYfhi bg'XUfUbž'k Y`W\Y'<YfUi gZcfXYfi b[ Yb  
gY'Vgh'\cW\_\UfÅh][ Y'? Øbgh'Yf'Xi fW\`YVYb'i bX'XUgg'XUg  
K c'\VYZ]bXYb']a a Yf'Ub'YfghYf'GhY''Y'ghY\Yb'gc''hY"

A ]h'X]YgYf'G]hi Uh]cb'k ]fX'XYi h']W\ž'k ]Y'j Yf'Yhn']W\`gY'Vgh'X]Y  
; fØ» hYb'i bhYf'XYb'? Øbgh'Yfb'g]bX''8]Y'; Ygi bX\Y]h'V'Y]Vh  
i bUbhUghVufž'i bX'X]Y'<cZbi b[ 'Ui Z'Y]bY'VU'X][ Y'; YbYgi b[ 'k Øfnh  
X]Y'J cfZfYi XY'Ui Z'\_ca a YbXY'5i Zhf]hY'' ð'XYb'gcn]U'Yb'A YX]Yb  
hY]Yb': Ubg']\fY'i bhYfghØhni b[ 'i bX']\fY'VYghYb'K ØbgW\Yž'k Ug  
nY][ hž'XUgg'hfc'h'XYf'9bhh'Åi gW\i b[ 'Y]bY'ghUf\_Y'; Ya Y]bgW\UZh  
VYghY\hž'X]Y'Ub'gY]bY'F ØW\_\_Y\ f[ 'Ui Vh"

## 9]b'6`]W\_`bUW\`j cfb

8]Y`G]hi Uh]cb`i a`A Uf]i g`A Ø`Yf!K YghYfb\U[ Yb`]gh`Y]b`6Y]gd]Y`  
XUZØfž`k ]Y`k ]W h][`Yg`]ghž`?Øbgh`Yf`]b`]\fYb`gWk ]Yf][`Yb`NY]hYb`ni  
i bhYfghØhnYb`"K Å\fybX`k ]f`Ui Z`B UWf]W hYb`ØVYf`gY]bY` ; YbYgi b[  
i bX`a Ò[ `]WY`bYi Y`HYfa ]bY`k UfhYbž`V`Y]Vh`X]Y`J cfZFYi XY`Ui Z  
gY]bY`F ØW\_\_Y\`f`ni f`6Ø\`bY`YVYbX][`"A i g]\_`V]YhYh`Hfcghi bX  
Ni gUa a Yb\U`hž`i bX`[ YfUXY`]b`gc`W`Y`fUi gZcfXYfbXYb  
A ca YbhYb`gY\`bYb`g]W`X]Y` : Ubg`bUW`X]YgYf`J YfV]bXi b[ "

8]Y`5VgU[ Yb`XYf`?cbnYfhY`\UVYb`b]W h`bi f`X]Y` : Ubgž`gcbXYfb  
Ui W`X]Y`A i g]\_gnYbY`ghUf`\_`VYhfcZZYb`"A Uf]i g`A Ø`Yf!  
K YghYfb\U[ Ybž`VY`\_Ubbh`ZØf`gY]bYb`W UfU`hYf]gh]gWYb`Gh`i bX  
nU\`fY]WY`<]hgž`\Uh`i]b`XYf`J Yf[ Ub[ Yb\Y]h`[ YnY][`hž`k ]Y`k ]W h][  
@]j Y!5i Zh]hhY`ZØf`Y]bYb`?Øbgh`Yf`g]bX`" ð`XYb`YhnhYb`\U\`fYb`\Uh`Yf  
g]W`ni bY\`a YbX`Ui Z`gY]bY`Hci fbYYb`\_`cbnYbhf]Yfhž`X]Y`b]W h`bi f  
Y]b`k ]W h][`Yg`9]b`\_ca`a Yb`XUfghY`Ybž`gcbXYfb`Ui W`Y]bY`X]fY`\_hY  
J YfV]bXi b[ `ni`gY]bYb`5b`Åb[ Yfb`Yfa Ò[ `]WYb`" ð`XYf`6fUbWY  
k ]fX`\`Åi Z][`VYhc`bž`XUgg`@]j Y!DYfZcfa UbW`g`XUg`<YfnghØW`XYf  
A i g]\_Yf`Uff]YfY`g]bXž`i bX`X]Y`U`hi Y`Y`G]hi Uh]cb`ghY`h`X]YgY  
J YfV]bXi b[ `]b` : fU[ Y`"

8]Y` ; Ygi bX\Y]hgdV`V`Ya Y`j cb`A Uf]i g`A Ø`Yf!K YghYfb\U[ Yb  
\_ØbbhYb`Ui W`a ]h`XYb`<YfUi gZcfXYfi b[ Yb`j YfVi bXYb`gY]bž`X]Y  
XUg`5`hYf`a ]h`g]W`Vf]b[ h`8Yf`GÅb[ Yf`]gh`b]W h`XYf`Y]bn][`Yž`XYf  
a ]h`[ Ygi bX\Y]h]WYb`DfcV`Ya Yb`ni`\_`Åa`dZYb`\Uh`j ]Y`Y`?Øbgh`Yf  
Yf`YVYb`]a`@Ui ZY`]\fYf`?Uff]YfY`Å\`b`]WY`<YfUi gZcfXYfi b[ Yb`"9g  
]gh`b]W h`i b[ Yk Ò\`b`]W ž`XUgg`Å`hYfY`A i g]\_Yfž`X]Y`ØVYf`\U\`fnY\`bhY  
]a` ; YgW`ÅZi`g]bXž`[ Ygi bX\Y]h]WY`F ØW`gW`Å[ Y`Yf`Y]XYbž`X]Y`]\fY  
Hci fd`ÅbY`VYY]bhf`ÅW h][`Yb`"Gc`WY`9fY][`b]ggY`k YfZYb`Ui W`Y]bYb  
GW`UhhYb`Ui Z`X]Y`Ni`\_i bZi`i bX`X]Y`A Ò[ `]W`\_Y]h`k Y]hYfYf`5i Zh]hhY`"

8]Y`5i gk ]f`\_i b[ Yb`Ui Z`X]Y` : Ubg`i bX`X]Y  
?i`h`i f

8]Y`5VgU[ Y`j cb`?cbnYfhYb`\Uh`b]W h`bi f`5i gk ]f`\_i b[ Yb`Ui Z`X]Y  
?Øbgh`Yfž`gcbXYfb`Ui W`Ui Z`X]Y` : Ubg`i bX`X]Y  
?i`h`i fj YfUbghU`hi b[ Yb`]bg[ YgUa h`J ]Y`Y` : Ubg`\UVYb`]\fY`H]W`Yhg  
]a`J cfUi g[ Y`\_Ui Zhi bX`ZFYi Yb`g]W`cZi`a`cbUhY`Ub[ `Ui Z`X]Y

5i Zhf]hhY`]\fYf`@YV`]b[ g\_ØbghYf"8]Y`5VgU[ Y`X]YgYf`9j Ybhg`\_Ubb  
ni`9bhhÀi gWxi b[ `i bX` : fi ghfUh]cb`ZØ\fyb" `b`j ]Y`Yb` : À`Yb`ghY`h  
g]Wx`X]Y` : fU[ Yž`cV`X]Y`H]W\_YhdFY]gY`YfghUhhYh`k YfXYb`i bX`k ]Y`g]Wx  
X]Yg`Ui Z`XUg`Z]bUbn]Y`Y` ; `Y]Wx [ Yk ]Wx`h`XYf`J YfUbgH`hYf`i bX`XYg  
?Øbgh`Yfg`Ui`gk`]f`\_h`

5i Wx`X]Y`c`\_U`Y`K` ]fhgWx`Uzh`X]Y`j`cb`J`YfUbgH`U`hi`b[`Yb`d`fc`Z]h]Yfhž  
gdØfh`X]Y` : c`[`Yb`gc`Wx`Yf`5VgU[`Yb" `J`YfUbgH`U`hi`b[`gc`fhYž  
 ; Ughfcbca ]YVYhf]YVY`i`bX`<`chY`Yf]Y`g]bX`\`Ài`Z[`j`cb`XYf`Df`ÀgYbn  
 [ fc»`Yf`?Øbgh`Yf`UV`\`Àb[`][`ž`i`a`9]bbU`a`Yb`ni`[`YbYf]YfYb"8]Y  
?fYUh]j`k`]fhgWx`Uzh]b`8Yi`hgWx`UbX`d`f`ÀgYbh]Yfh`g]Wx`U`g  
Ya`d`Z]bX`]Wx`Yf`6YfY]Wx`ž]b`XYa`j`]Y`Y` : U`hc`fYb  
ni`gUa`a`Yb`\_ca`a`Yb`ž`i`a`Y]bY`Zcf]YfYbXY`?i`hi`fgnYbY`ni  
gWx`UZZYb"8]Y`5i`gk`]f`\_i`b[`Yb`gc`Wx`Yf`5VgU[`Yb`\_ØbbYb  
k`Y]hfY]Wx`YbXY` : c`[`Yb`ZØf`X]Y`[`YgUa`hY`6fUbWx`Y`\UVYb"

; Ygi bX`X`Y]h`]Wx`Y`5gdY`\_hY`i`bX  
?Øbgh`Yfa`UbU[`Ya`Ybh

8]Y` ; Ygi bX`X`Y]hj`cb`?Øbgh`Yfb`]gh`Y]b`YbhgWx`Y]XYbXYg`H`Ya`Už`XUg  
cZi]a`G`Wx`UhhYb`XYg`Fi`\`a`g`ghY`\h"6Y]`A`Uf]i`g`A`Ø`Yf!  
K`YghYfb`\U[`Yb`k`]fX`j`cb`Y]bYa` ` \Ufhb`ÀW\_] [`Yb`j`]fU`Yb` `b`ZY`\_h  
 [`Ygd`fc`Wx`Yb`ž`k`Ug`i`bg`XUfUb`Yf]bbYfhž`k`]Y`k`]Wx`h[`Y`g`]ghž`Ui`Z`X]Y  
Y][`YbY` ; Ygi bX`X`Y]h`ni`UWx`hYb`ž]bgVYgc`bXYfY`]b`Y]bYa`ghfYgg][`Yb  
6Yfi`ZgZY`X`k`]Y`XYf`A`i`g\_]bXi`ghf]Y"9]b` , VY`ghUbX`\_Ubb`b]Wx`h`bi`f  
XYb`9]bnY`bYb`VYhfYZZYb`ž`gcbXYfb`Ui`Wx`Y]b`[`UbnYg`HYUa`ž`XUg  
\]bhYf`XYb`?i`]ggYb`UfVY]hYhž]cb`HYWx`b\_]Yfb`V]g`ni`A`UbU[`Ya`Ybh  
i`bX`?Øbgh`YfVYhfYi`Yfb"

⇒ G]bbY`XYg`?Øbgh`Yfa`UbU[`Ya`Ybhg`gc`hYb`k`À`fYbX`Y]bYf  
9f`fUb`\_i`b[`gc`Wx`Y`<`YfUi`gZc`fXYfi`b[`Yb`fYWx`hnY]h][`\_ca`a`i`b]n]Yfh  
k`YfXYb`ž`i`a`9bhhÀi`gWxi`b[`Yb`i`bX`GdY`\_i`Uh]cbYb`]a`J`cfZY`X`ni  
j`Yfa`Y]XYb"8]Yg`\_ØbbhY`\_ØbZh][`XUni`ZØ\fyb`ž`XUgg`a`Y`f`?Øbgh`Yf  
hfUb`gdUfYb`h`ØVYf`]\fY`[`Ygi`bX`X`Y]h]Wx`Yb`DfcV`Ya`Y]bZcfa`]YfYbž  
i`a`XUg`J`Yfgh`À`bXb]g`i`bX`X]Y`i`bhYfgh`Ø`hni`b[`]fYf` : Ub[`Ya`Y]bXY  
ni`ZØfXYfb" `A`Ø[`]Wx`Yfk`Y]gY`gY`Yb`k`]f`Ui`Wx`Y]bY`Yf`\`Ø`hY  
GYbg]V]g]Yfi`b[`ZØf`X]Y` ; Ygi bX`X`Y]hj`cb`?Øbgh`Yfb`ž`k`Ug  
]bgVYgc`bXYfY`]b`Y]bYf`6fUbWx`Y`ž`X]Y`cZi]cb`8fi`W`\_i`bX`GhfYgg

[ YdfÀ[ h]ghžj cb'6YXYi hi b[ 'gY]b'\_Ubb"

8YhU]`g

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