

\* `8 ]b[ Yž`X]Y `a Ub `Y]bYa `9I dUh`b]W\ h  
gU[ Yb `gc ``hY

5`g`HY]`XYg`?i `hi fgW\cW\_! : fU[ YVc[ Ybg`j cb`hYfbUh]cbU`g  
k i fXYb`X]Y`A YbgW\Yb`[ YVYhYbž`a ]hni hY]`Ybž`k Ug`g]Y`j cb  
A YbgW\Yb`]b`]\fYa `U`hYb`cXYf`bYi Yb`@JbX`ni ` \ÖfYb`gUhh  
`UhhYb` `i bX`hY]`Yb`g]Y`hUhYb" `< ]Yf`]gh`Y]bY`@]ghY  
k ]YXYf`\_Y`fYbXYf`H`Ya Yb`]b`K cfhYb`X]fY`\_h`Ui g`XYa `A i bX  
j cb`9I dUhg" `K Ybb`G]Y`Y]bYb`9I dUh! : fYi bX`cXYf`Y]b  
: Ua `]Y]Yba ]h[ `]YX`UVYbž`a ÖW\hYb`G]Y`j ]Y`Y]W\h`XUj cb  
UVgY`Yb` / Ua d/ , &&&/8i `V]gh`gc [ `ØW\_`]W\ / Ua d/ , &&\$/  
ž`k ]f`j YfghY`Ybž`XUgg`k ]f`i bg`]b`Y]bYa `gcb]b[ YfYb`@JbX  
`a ]h`ZfYi bX`]W\YfYb`A YbgW\Yb`i bX`VYggYfYb  
`εVa Ö[ `]W\`\_Y]hYb`VYZ]bXYbž`UVYf`ni `k ]YXYf`c`Ybž`k ]Y  
[ `ØW\_`]W\ `k ]f`g]bXž`a d`n]Yfhž`XUgg`A i hž`UfhY`5fVY]hi bX  
< Ufhb`ÄW\_] [ \_Y]h`\_Y]bY`F c``Y [ Ygd]Y`h`UVYb" `K Ybb`Xi `Xcfh  
`YVYb` / Ua d`^Y``]d/

5`g`HY]`XYg`?i `hi fgW\cW\_! : fU[ YVc[ Ybg`j cb`hYfbUh]cbU`g  
k i fXYb`X]Y`A YbgW\Yb`[ YVYhYbž`a ]hni hY]`Ybž`k Ug`g]Y`j cb  
A YbgW\Yb`]b`]\fYa `U`hYb`cXYf`bYi Yb`@JbX`ni ` \ÖfYb`gUhh`UhhYb`  
i bX`hY]`Yb`g]Y`hUhYb" `< ]Yf`]gh`Y]bY`@]ghY`k ]YXYf`\_Y`fYbXYf`H`Ya Yb  
]b`K cfhYb`X]fY`\_h`Ui g`XYa `A i bX`j cb`9I dUhg" `K Ybb`G]Y`Y]bYb  
9I dUh! : fYi bX`cXYf`Y]b` : Ua `]Y]Yba ]h[ `]YX`UVYbž`a ÖW\hYb`G]Y  
j ]Y`Y]W\h`XUj cb`UVgY`Yb`

## 8i `V]gh`gc [ `ØW\_`]W\

ž`k ]f`j YfghY`Ybž`XUgg`k ]f`i bg`]b`Y]bYa `gcb]b[ YfYb`@JbX`a ]h  
ZfYi bX`]W\YfYb`A YbgW\Yb`i bX`VYggYfYb`εVa Ö[ `]W\`\_Y]hYb  
VYZ]bXYbž`UVYf`ni `k ]YXYf`c`Ybž`k ]Y [ `ØW\_`]W\ `k ]f`g]bXž  
]a d`n]Yfhž`XUgg`A i hž`UfhY`5fVY]hi bX`< Ufhb`ÄW\_] [ \_Y]h`\_Y]bY`F c``Y  
[ Ygd]Y`h`UVYb" `K Ybb`Xi `Xcfh`YVYb`a ÖW\hY]ghž`k`c`k ]f`YVYbž

\_Ubbgh'Xi`XUgž'UVYf'Xi`YbhgW'Y]XYgh'X]W'XU[ Y[ Yb"8 Ug`]Y[ h  
b]W'h'XUfUbž'XUgg'G]Y'DYW' \ UVYb/9g']gh'Y]bY'9bhgW'Y]Xi b[ ž'X]Y  
G]Y' [ YhfcZZYb \ UVYbž' [ YbUi`k ]Y'a Y]b'bYi Yg'@UbX'Y]bY  
9bhgW'Y]Xi b[ ]ghž'X]Y`]W' [ YhfcZZYb \ UVY"

## ? ÖbbYb`G]Y`gW'cb`Z]Y» YbX`gdfYW'Yb3

⇒a`9fbghž'k ]ggYb`G]Yž'k ]Y`Ub[ Y`Yg`XUi Yfhž'Y]bY`GdfUW'Y`Z]Y» YbX  
ni`VY\YffgW'Yb3`Gc`j ]Y`Y`j cb`i bg`j Yfvf]b[ Yb`YXYb`HU[ `Ghi bXYb  
a ]hi bgYfYf`bYi Yb`GdfUW'Y`i bX`Yg`]gh`Zfi`ghf]YfYbX` [ Ybi [ ž'k Ybb  
k ]f`bUW'Y]bYa`š\`f`bcW'`b]W'h`Y]ba U`Ui`Z'? ]bXYf[ UfhYbb]j YUi  
g]bX"K Ybb`k ]f`ZfU[ Ybž'cV`k ]f`Z]Y» YbX`gdfYW'Ybž`ZØ`Yb`k ]f`i bg  
XYbbcW'`j Yf`Y[ Yb`i bX`a ]bXYfk Yfh][ ž`U`gc`hi b`G]Y`Yg`V]hhY`b]W'h`

## 6]hhYž'gc`gW`]a`a`\_Ubb`Yg`b]W'h`gY]b

K Ybb`]W'a ]W'XUfØVYf`VYgW'k YfYž'k ]Y`Zfi`ghf]YfYbX`Yg`]ghž'Y]b  
bYi Yg`6Ub\_\_cbhc`ni`YfØZbYbž'k Ybb`]W'bcW`\_Y]bY`ZYghY  
5XfYggY` \ UVYž'gU[ Yb`G]Y`V]hhY`b]W'h` Gc`gW`]a`a`\_Ubb`Yg`b]W'h  
gY]b`8i`k`c`b`gh`Ua`GhfUbX`°`cXYf`8i` \ Ugh`XUg`[ Ubny`š\`f  
GcbbYbgW'Y]b`J Yfgi W'Yb`G]Yž'g]W'`]a`ghfØa`YbXYb`F Y[ Yb`ZØf  
BUhk Ygh`Ubni`ghY`Yb`°

Bi`f`k`Y`]W'`i`a` [ Ync[ Yb`V]bž`\Y]» h`XUg`b]W'hž`XUgg`U`Y`a`Y]bY  
DfcV`Ya`Y`k`Y[ [ YgW'a`c`nYb`g]bX"A`Y]b`bYi Yg`@UbX`\Uhj ]Y`Y]W'h  
VYggYfYg`K`YhhYfž'UVYf`XUg`VYgY]h][ h`b]W'h`Ui`hca`Uh]gW'U`Y`  
a`Y]bY`DfcV`Ya`Y"

## B ]W'hž'XUgg`Yg`X]f`k ]W'h][`k`ÄfY

⇒W`V]b`]b`Y]bYa`bYi Yb`@UbXž'XUg`]W'a`Y]bY`<Y]a`Uh`bYbbYž`Už  
UVYf`XUg`VYXYi`hY`h`b]W'hž`XUgg`]W'a`]W'b]W'h`ZØf`X]Y`Ni`gh`ÄbXY`]b  
a`Y]bYf`U`hYb`<Y]a`Uh]bhYfYgg]YfY`cXYf`VYi`bfi` \][ Y"⇒a`J`cfZY`X  
XYf`Vf]h]gW'Yb`DUf`Ua`Ybhgk`U`Yb`&\$%)`k`i`fXY`a`]f`a`Y`f`U`g  
Y]ba`U`[ YgU[ hž`XUgg`Yg`a`]W'b]W'hg`Ub[ Y`hž'k`Y`]W'gY]h`ink`Y]  
š\`fYb`]b`5i`ghfU`]Yb`V]b"⇒W`\_Øa`a`YfY`a`]W'`]a`a`Yf`bcW`i`a`XYb

B < Gž'i bgYf'6]Xi b[ ggmghYa 'i bX'U''X]Y'8]b[ Yž'X]Y'; fc» Vf]hUbb]Yb  
ni'; fc» Vf]hUbb]Yb'a UWYb''9g'VYXYi hYh'a ]f'Yhk Ug''GU[ 'a ]f  
b]Włhž'XUgg'Yg'XUg'b]Włh'hi h'

8 i 'gc`hYghj Yfgi WłYbž'X]Wł'a ]h'a Y\ f  
9]b\Y]a ]gWłYb'Ubni ZfYi bXYb

C\_Umž]Wł'k Y]» ž'XUgg]Wł'a Y\ f'Yb[ ]gWłgdfUWł][ Y': fYi bXY'\UVY  
U'g'b]Włhž'UVYf'Yg]gh'Y]bZUWłYfž'a ]h']\bYb'?cbhU\_h'Ui Zni bY\ a Yb'  
'ni f'NY]h''6]g]Wł'X]Y'@UbXYggdfUWłY'Ui ZY]bYa'Zcfh[ YgWłf]hhYbYb  
B]j YUi 'YfbYž'\_Ubb]Wł'a ]Wł'bi f'VY[ fYbnh'a ]h'9]b\Y]a ]gWłYb  
i bhYf\U'hYb''9b[ ]gWł'gh'X]Y'GdfUWłYž]b'XYf]Wł'XYb\_Yž'k Y]bYž  
\[ \k YfXYž'i bX'a UbWł'a U'VfUi WłY'Wł'Y]bZUWł'@Yi hYž'a ]h  
XYbYb'a Ub'a Ø\Y'cg'ni gUa a Yb']gh''9]b\Y]a ]gWłY': fYi bXY  
k YfXYb'a ]h'XYf'NY]h'\_ca a Ybžj YfgdfcWłYb"

K Ubb'n]Y\ gh'Xi 'k ]YXYf'bUWł' < Ui gY3

; 'Ui Vgh'Xi ž]Wł'\UVY'&\$'HcbbYb'; YdÅW\_[ YdUW\_h'i bX'ni a 'GdU»  
ØVYf'XYb'5h'Ubh]\_[ YgWł'Yddh3'BY]b''A Y]b'bYi Yg'@UbX']gh'a Y]b  
bYi Yg'Ni \Ui gY''J]Y''Y]Wł'h'k YfXY]Wł'Y]bYg'HU[ Yg' bUWł' < Ui gY  
n]Y\Yb ž'UVYf'XUg'k Y]» ]Wł'b]Wł'h'[ YbUi ''a 'A ca Ybhj Yfgi WłY']Wł  
Yg]b'a Y]bYf'bYi Yb' < Y]a Uh''6]hhY'i bhYfghØhnh'a ]Włž'UbghUhh'gc'ni  
hi bž'U'g'k ÅfY'Yg'Y]bY'D\UgY"

@Y]hV]'X:'8fYUa gh]a Y

8 YhU]`g

6 Ygi WłYb'G]Y'i bg'Ui Z.'Y]bY!fY]gY"XY