

%": 7`B ØfbVYf[ `g]W\ Yfh'g]W\ `6Yf\_Um  
M`a Un.`Nk Y]`À\ f][ Y`@Y]\ Y`j ca `G7  
: fY]Vi f[

A ]fcg`Uj `?`cgY`\_ØbbhY`6Yf\_UmM`a Un`j ca `G7 : fY]Vi f[  
`Y]\ Ybž`i a `B ØfbVYf[ g`HU`YbhY`\_ØbZh][ `k Y]hYfni Ybhk ]W\_Y`b"

A ]fcg`Uj `?`cgYž`XYf`HfU]bYf`XYg`%": 7`B ØfbVYf[ ž`ghY`h`j`c`f`Y]bYf`  
j ]Y`j`YfgdfYW\ YbXYb`J`YfdZ]W\ hi`b[ `ZØf`gY]b`HYUa`" `@Ui`h`6Yf]W\ hYb`  
\_ØbbhY`6Yf\_UmM`a Un`ž`Y]b`HU`Ybh`j`ca `G7 : fY]Vi f[ ž]b`?`ØfnY`XYb`  
K`Y[ `bUW\ `B ØfbVYf[ `UbhfYhYb`"8]Yg`ghY`h`Y]bY`ghfUhY[ ]gW\ Y`  
9bhgW\ Y]Xi`b[ `XUfž`X]Y`?`cgY`i`bX`gY]b`A`UbU[ `Ya`Ybh`HYUa` `]a`  
F`U\`a`Yb`]\`fYf`6Ya`Ø\`i`b[ `Yb`i`a`X]Y`9bhk`]W\_`i`b[ `↑`b[ `Yf`Gd]Y`Yf`  
[ `YhfcZYb`\`UVYb"

8Yf`%-`!`À\ f][ Y`M`a` Un`]gh`Y]b`hU`Ybh]YfhYf`@]b\_gj`YfhY]X][ `Yfž`XYf`]b`  
XYf`j`Yf[ `Ub[ `YbYb`GU]gcb`ZØf`X]Y`i`&` `XYg`G7 : fY]Vi f[ `]b`XYf`" `"  
@[ `U`Ui`Z`g]W\ `Ui`Za`Yf\_gUa` `a`UW\ hY`"8`c`fh`gUa` `a`Y`h`Y`Yf`]b`%`  
9]bg`À`hnYb`ZØbZ`G`W`c`fYfdi`b`\_hY`"8]Yg`nY][ `hž`XUgg`Yf`b]W\ h`bi`f`  
XYZYbg]j`ghUf`\_]ghž`gcbXYfb`Ui`W\ `c`ZYbg]j` `5\_nYbhY`gYhnYb`\_Ubb`"  
9]b`k`]W\ h][ `Yf`5gdY`\_h`VY]`XYf`J`YfdZ]W\ hi`b[ `j`cb`M`a` Un`]ghž`XUgg`Yf`  
VYfY]hg`Y]bYb`bYi`Yb`Ub[ `Zf]gh][ `Yb`J`YfhfU[ `]b` : fY]Vi f[  
i`bhYfnY]W\ bYh`\`Uhž`k`Ug`X]Y`5Vg]W\ hYb`XYg`J`YfY]bg`i`bhYfghfY]W\ hž`  
]\`b`Ub[ `Zf]gh][ `Ub`g]W\ `ni`V]bXYb"

### HfUb`gZYfXYhU]`g`i`bX`9fk`Ufhi`b[ `Yb`

@Ui`h`XYa` : `YfbgY\`gYbXYf`G`\_m`\`UVYb`g]W\ `X]Y`J`YfUbhk`c`fh]W\ Yb`  
XYg`%": 7`B ØfbVYf[ `a`]h: fY]Vi f[ `Ui`ZY]bY`@Y]\ Y`ZØf`nk`Y]`š\`fY`  
[ `YY]b][ `h`"8]Yg`VYXYi`hYhž`XUgg`M`a` Un`ni`b`ÀW\ gh]b`XYf`&`"  
6i`bXYg`][ `U`VY]`B ØfbVYf[ `Gd]Y`dfUI`]g`gUa` `a`Y`b`k`]fXž`VYj`c`f`Yf`  
bUW\ : fY]Vi f[ `ni`fØW`\_Y`\`fhž`i`a` `g]W\ `X`c`fh]b`XYf`YfghYb`

A UbbgWUZhini `VY\Ui dhYb"GY]bY`FØW\_\_Y\fbUW : fY]Vi f[ ` \_ÖbbhY  
XUbb`a`jh`bYi`Yb : Å\][ \_Y]hYb`i`bX`k`Yfhj`c`Yf`9fZU\fi`b[ `]a` : YdÅW\_  
[ YgWY\Yb"

Æ`XYb`YhnhYb`A`cb`UH`Yb`U`hY`M`a`Un`VYfY]hg`XUg`Æ`hYfYggY  
a`Y`fYfYf`Yi`fcdÅ]gWYf`Hcd`\_i`Vg`[ Yk`YW`hž`k`Ug`gY]bY`c`Yb  
E`i`U`]h`hYb`bc`W`Y]ba`U`i`bhYfghfY]W`h" : UVf]n]c`F`ca`Ubc`ž`Y]b  
VY`\_Ubb`hYf`Hf`Ubg`ZYf]bg]XYf`ž`hY]`hY`VYfY]hg`]a``ž`]`a`]hž`XUgg`gY]b  
BUa`Y`]b`c`W`\_Ugg][ Yb`?`fY]gYb`[ Y`U`b`XY`h`k`i`fXY`"Hf`cn`XYa  
[ Y`Ub`[ `Yg` : fY]Vi`f[ ž`\b`j`cb`XYf`DYf`gdY`\_h]`Y`VY]`]\b`Yb`ni  
ØVYfnYi`[ Yb`" ?`c`gY`g]Y`h`]b`M`a`Un`X]Y`A`Ò[ `]W`\_Y]hž`gY]b`HYUa  
b]W`h`bi`f`gdc`fh]W`ni`gh`Å`f`\_Yb`ž`gcb`XYfb`Ui`W`j`cb`XYf`9`b`hk`]W`\_i`b[  
↑`b`[ Yf`Gd]Y`Yf`ni`d`fc`Z]h]YfYb`ž`k`Ug`]b`XYf`U`\_hi`Y`Yb  
Hf`Ubg`ZYf`d`Yf]c`XY`Y]b`Y`n`Y`b`hf`U`Y`G`hf`UhY`[ ]Y`XYg` : 7`B`]gh"

?`c`gY`U`h`ni`j`c`f`VYfY]hg`Y]b][ Y`VY`a`Yf`\_Y`bgk`YfhY`B`Yi`ni`[ Å`b`[ Y  
Y]b`[ YZ`AXY`hž`XUfi`bhYf`C`]j`Yf`J`]`UX`gYb`i`bX`ž`]Ub`ž`ghj`Ub`"  
@YhnhYfYf`U`h`g]W`X`i`f`W`gY]bY`@Y]ghi`b`[ Yb`]b`XYf`j`Yf`[ Ub`[ Yb`Yb  
GU]gcb`U`g`k`Yfhj`c`Yf`Gd]Y`Yf`ZØf`XUg`HYUa`Yfk`]YgYbž  
]bgVYgcb`XYfY`b`UW`gY]bYa`Yb`hgW`Y]XYb`XYb`6Y]hfU`[ ž`XYf`  
<c`ZYb`Y]a`]a` : 8` : 6!Dc`\_U`VYg]Y`[ hY`"A`]h`XYf`J`Yfd`Z]W`hi`b`[ j`cb  
M`a`Un`\_Ö`bbhY`?`c`gY`bi`b`Y]b`Yb`k`Y]hYfYb`k`]W`h][ Yb  
K`i`bgW`gd]Y`Yf`]b`XYb`?`UXYf`]b`hY`[ f]YfYb`"

8]Y`9`b`hgW`Y]Xi`b`[ ž`M`a`Un`ZØf`nk`Y]`š`Y`fY`]b`X]Y`&`"6`i`b`XYg`][ U  
Ubni`Y`i`Yfb`ž`k`]fX`U`g`ghf`UhY`[ ]gW`\_i`[ `Y]b`[ Yghi`Zh`8`Yf`HfU]b`Yf  
i`bX`Gdc`fhj`c`fgh`UbX`æ`h]`7`U`h]U`Yi`]ci`gYhnYb`Ui`ZY]b`Y  
HU`Y`b`h`ZØf`XYfi`b`[ `i`b`X`gY`Yb`]b`M`a`Un`XUg`D`ch`Y`bn]U`ž`i`a`X]Y  
A`Ufg`W`f]W`hi`b`[ XYg`J`YfY]bg`]a`<`]bV`]W`\_Ui`Z`ni`\_Ø`b`Zh][ Y`9`f`Zc`[ Y`ni  
dfÅ`[ Yb`"8]Y`@Y`\Y`[ ]Vh`]\a`X]Y`A`Ò[ `]W`\_Y]hž`g]W`Ui`Z  
dfc`ZYgg]cb`Y`Y`a`B]j`YUi`ni`VYk`Y]gYb`i`bX`[ `Y]W`nY]h][ `X]Y`b`Øh][ Y  
9fZU\fi`b`[ `ni`g`Ua`a`Y`b`ž`i`a`gd`Å`hYf`]b : fY]Vi`f[ ` : i`»`ni`ZUggYb`"

8]Y`9`b`hk`]W`\_i`b`[ Yb`fi`bX`i`a`6Yf`\_Um`M`a`Un`g]b`X`Y]b  
ZUgn]b]YfYb`XYg`NY]W`Yb`ZØf`X]Y`5a`V]h]cb`Yb`XYg`%`" : 7`B`Øfb`VYf`[ "  
8]Y`»`XYž`a`]h`↑`b`[ Yb`HU`Y`b`hYb`ni`UfVY]hYb`i`bX`]b`Yb`XYb`K`Y`[ `]b  
XYb`D`fc`Z]ž`»`VU`ni`Y`V`b`Yb`ž`\`Uh`XUg`D`ch`Y`bn]U`ž`Y]b`Y`b`Yi`Y`Y`f`U`ZØf`  
XYb`J`YfY]b`Y]b`ni`Y]hYb`"Æ`Y]b`Yf`NY]hž`]b`XYf`Z]b`Ubn]Y`Y`A`]hY`c`Zh

ØVYf`G]Y[ `cXYf`B]YXYf`U[ Y`Yb`hgW`Y]XYbž`\_ØbbhY`X]Y`gc[ YbUbbhY`  
B UW`k i W`gUfVY]h`ZØf`XYb` : 7B`XYf`GW`ØggY`ni a`'9fZc`[ `gY]b"

: mbUbn]Y`Y` , VYf`Y[ i b[ Yb`i bX`ghfUhY[ ]gW`Y`  
J ]g]cb

⊕XYa`BØfbVYf[ `Ui Z`@Y]\Yb`j cb`Gd]Y`Yfb`gYhnhž`X]Y`[ `Y]W`nY]h][  
XUg`DchYbn]U``\UVYbž`g]W`]b`XYf`6i bXYg`][ U`ni`VYk`Y]gYbž`  
j YfZc`[ h`XYf`J YfY]b`Y]bYb`Ub[ Zf]gh][ Yb`D`Ub`ni`f`GhUV`]g]Yfi b[  
i bX`J YfVYggYfi b[ `gY]bYf`gdcfh]W`Yb`G]hi`Uh]cb"8]Y`Z]bUbn]Y`Yb`  
⊕j Ygh]h]cbYb`]b`HU`YbhY`k ]Y`6Yf`\_Um`M`a` Un`g]bX`ØVYfgW`Ui`VUfž`  
k`Å\`fYbX`X]Y`dchYbn]Y`Y`F`YbX]hY`]b` : cfa`j`cb`ni`\_ØbZ]h][ Yb`  
J Yf`\_Ui`Zgk`YfhYb`i bX`gdcfh]W`Yb`9fZc`[ Yb`]a`a`Ybg`gY]b`\_ØbbhY`  
8Ugg`?`cgY`gY]bY`⊗YYb`ØVYf`X]Y`9bhk`]W`\_i`b[ `↑`b[ Yf`Gd]Y`Yf`  
Yfk`Y]hYfh`\Uh`i bX`[ `Y]W`nY]h][ `Ui`Z`X]Y`9fZU`fi b[ `X]YgYf`HU`YbhY`  
j YfhfUi`hž`]gh][ fcV`[ YgU[ h`XYf`GW`ØggY`ni a`'9fZc`[ `XYg` : 7B`]b`  
XYb`\_ca`a`YbXYb`GU]gcbg"

8]Y`J`Yf`Y]\Y`j`cb`HU`YbhYb`k`]Y`6Yf`\_Um`M`a` Un`g]bX`Y]b`k`]W`h][ Yf`  
6YghUbXhY]\`XYf`U`\_hi`Y`Yb`HfUbgZYfghfUhY[ ]Yb`XYf` : i`»`VU`Wi`Vgž`  
]bgVYgcbXYfY`]b`8Yi`hgW`\_UbX`"<]YfVY]\`Y[ h`Y]b` : c`\_i`g`Ui`Z`XYf`  
9bhk`]W`\_i`b[ `↑`b[ Yf`Gd]Y`Yfž`X]Y`Ui`Z`XYa`D`Uhn`9fZU`fi b[ Yb`  
gUa`a`Y`b`\_ØbbYbž`c`bY`XUgg`\`fY`?`Uff]YfYb`ghU[ b]YfYb"8Ug`  
@Y]\gmgHYa`Yfa`Ø[ `]W`h`Ygž`HU`YbhY`]b`Y]bYa`\_`cb`\_i`ffYbnZÅ\][ Yb`  
I`a`Z`X`Y]bni`gYhnYbž`k`Å\`fYbX`[ `Y]W`nY]h][ `XYf`7`i`Vž`XYf`XYb`  
Gd]Y`Yf`j`Yf`Y]\hž`]b`XYf`@U[ Y`]ghž`j`cb`gY]bYb` : Å\][`\_Y]hYb`ni`  
dfcZ]h]YfYbž`c`bY`gY]bY`Ub[ Zf]gh][ Yb`D`ÅbY`ni`[ YZÅ`fXYb"

8]Y`K`U`\`XYg`%" : 7`BØfbVYf[ `U`g`@Y]\j`YfY]b`ZØf`M`a` Un`\_ØbbhY`  
ghfUhY[ ]gW`[ `Øbgh][ `gY]b"8Yf`7`i`V`\Uh]b`XYf`J`Yf[ Ub[ Yb`Y]h`  
]a`a`Yf`k`]YXYf`[ YnY][ hž`XUgg`Yf`VYfY]h`]ghž`↑`b[ Y`Gd]Y`Yf`ni`  
]bhY[ f]YfYb`i bX`XYfYb`9bhk`]W`\_i`b[ `j`cfUbni`hfY]VYb"8]Yg`\_ØbbhY`  
M`a` Un`X]Y`A`Ø[ `]W`\_Y]h[ YVYbž`k`Yfhj`c`Y`9]bgÅhnY`]b`XYf`&"  
6i bXYg`][ U`ni`gUa`a`Y`b"

8]Y`F`c`Y`j`cb``đ`[ YbXU`\_UXYa`]Yb`]a`  
XYi`hgW`Yb` : i`»`VU`

⇒ XYi hgWYb : i » VU`gd]Y`Yb`đ [ YbXU\_UXYa ]Yb`Y]bY  
 YbhgWY]XYbXY`F c`Y"8Yf`G7 : fY]Vi f[ `VY]gd]Y`gk Y]gY`Uhg]W  
 Y]bYb`BUa Yb`[ Ya UW`hXi fW`X]Y`5i gV]`Xi b[ `hU`Ybh]YfhYf`Gd]Y`Yfž  
 X]Y`Ài Z][ `XYb`Gdfi b[ `]b`X]Y`DfcZ]!A UbbgW`UZhigW`UZYb`"@Ui h  
 Y]bYf`Ghi X]Y`XYg` 8Yi hgWYb : i » VU`!6i bXYg` fB : 6Ł`UVYb  
 J YfY]bY`a ]h`Y]ghi b[ gghUf`\_Yb`đ [ YbXU\_UXYa ]Yb`b]W`h`bi f`Y]bYb  
 Yf\`Ò`hYb`BUW`k i W`gYfZc`[ ž`gcbXYfb`\_ÒbbYb`Ui W`VYXYi hYbXY  
 HfUbgZYfYf`ÒgY`[ YbYf]YfYbž`k Ybb`]\fY`HU`YbhY`gd`hYf`j Yf`\_Ui Zh  
 k YfXYb"

8]YgY`5WUXYa m`GhfUH] [ ]Y`Uhg]W`Ui W`Ui ZX]Y`6i bXYg`][ U  
 Ui g[ Yk Y]hYhž`k c`HYUa g`k ]Y`F 6`@Y]dn][ `cXYf`6cfi gg]U`8cfha i bX  
 VY`\_Ubb`h`XUZ`f`g]bXž`↑ b[ Y`Gd]Y`Yf`ni `gW`i hYb`i bX`Ui gni V]`XYb"  
 9]bY`YfZc`[ fY]W`Y`BUW`k i W`gUfVY]h`\_Ubb`b]W`h`bi f`X]Y`gdcfh]W`Y  
 @Y]ghi b[ `XYf`HYUa g`ghY][ Yfbž`gcbXYfb`Ui W`ni f`Z]bUbn]Y`Yb  
 GhUV]`]h`h`VY]hfU[ Yb`"8Yf` : c`\_i g`Ui Z`HU`YbhY`k ]fX`k Y]hYf`]\b`Y]b  
 nYbhfU`Yg`H`Y`a U`]b`XYb`8]g`\_i gg]cbYb`i a`X]Y`HfUbgZYf`dc`]h]\_`XYf  
 J YfY]bY`gY]b"

## 5\_hi Y`Y`GhUh]gh]\_Yb`ni f`HU`YbhZ`fXYfi b[ `]b XYf`6i bXYg`][ U

J YfY]b                      5bnU`XYf                      9fZc`[ gei chY  
                                  Y]b[ YgYhnhYb                      fDi b`hY`Ui g`Gd]Y`Yb  
                                  I`&%!Gd]Y`Yf`fGU]gcb                      a ]h!`&%!Gd]Y`YfbŁ  
                                  &\$&`#&(Ł

: 7`B`ØfbVYf[	(	%)
G7 : fY]Vi f[	*	%,
6cfi gg]U`8cfha i bX	,	&"\$

8]YgY`8UH`Yb`j YfXYi h]W`Ybž`k ]Y`Ài Z][ `J YfY]bY`k ]Y`6cfi gg]U  
 8cfha i bX`i bX`XYf`G7 : fY]Vi f[ `Ui Z`↑ b[ Y`HU`YbhY`j YfhfUi Yb`i bX  
 XYfYb`@Y]ghi b[ `ni `gW`À`h`Yb`k ]ggYb`"6YgcbXYfg`X]Y  
 A UbbgW`UZhYbž`X]Y`]bhYb]g]`Ui ZX]Y`h`hY[ fUh]cb`↑ b[ Yf`Gd]Y`Yf  
 gYh`Ybž`nY][ Yb`Ài Z][ `Ui W`VYggYfY`9f[ YVb]ggY`Ui ZX]Ya`D`Uhn"  
 8Ug`6Y]gd]Y`j cb`6Yf`\_Um`M`a Un`\_ÒbbhY`Zc`[ `]W`b]W`h`bi f`Z`f  
 gY]bY`dYfg`Òb`]W`Y`9b`hk ]W`\_i b[ `YbhgWY]XYbX`gY]bž`gcbXYfb`Ui W`  
 Y]bYb`k Y]hYfYb`GW`f]h]b`XYf`U`[ Ya Y]bYb`HYbXYbn`ni f

: ÖfXYfi b[ '† b[ Yf·HU·YbhY·]a 'XYi hgWXYb': i » VU``XUfghY``Yb"

8YhU]`g

6Ygi WXYb·G]Y·i bg·Ui Z·b!U[ "XY