

5`Ufa ]YfYbXY`B]YXYf`U[ Y.`FYX`6i ``]b`XYf`  
: cfa Y`%i bhYf`8fi W\_

<Y`a i h`A Uf\_c`k Ufbh`bUW`J YfghUddYbg`B]YXYf`U[ Y`]b  
NUbXj ccfh`FYX`6i ``[ YZ`fXYhž`\_cbghfi \_hj] Y`@0gi b[ Yb  
[ YZcfXYfh"

8Yf`; fUbX`Df]l`XYf`B]YXYf`UbXY`]b`NUbXj ccfh`\Uh`X]Y  
: cfa Y`!%K Y`h`Ui Z[ Yf0hY`h"8Yf`A chcfgcdfhVYfUHyf`<Y`a i h`A Uf\_c  
j cb`FYX`6i ```Ai »YfhY`g]W`VYgcf[ h`0VYf`X]Y`@]ghi b[ `gY]bYg  
HYUa gž`bUW`XYa`A Ul`J YfghUddYb`]a`FYbbYb`[ Y[ Yb`@UbXc  
Bcff]g`j cb`A W@UFYb`XYi h`]W`i bhYf`Y[ Yb`k Uf``8]YgYf`F0W\_gW`U[  
\_0bbhY`[ fUj ]YfYbXY`5i gk ]f\_i b[ Yb`Ui Z`X]Y`K Y`ha Y]ghYfgW`UZh  
\UVYbž`k ]Y`A Uf\_c`VYhcbh" `9g`]gh`U`Ufa ]YfYbX"8Ug`HYUa`a i gg  
\ÀfhYf`UfVY]hYbž`cXYf`VY]XY`K Y`ha Y]ghYfgW`UZhYb`g]bX`]b` ; YZU`f`ž  
gc`A Uf\_c`VY]Y]bYa`i`hYfj ]Yk`a ]h`XYa`i` : UW`a U[ Un]b  
5i hcgcdcfh "

@UbXc`Bcff]g`ZY]YfhY`Y]bYb`0VYfk`À`h][ YbXYb`G]Y[ `a ]h`ZUgh`&  
GY\_i bXYb`J cfgdfi b[ `Ui Z`J YfghUddYbž`XYf`hfc`hn`X]YgYf`B]YXYf`U[ Y  
X]Y` ; YgUa hk`Yfhi b[ `XYf`K Y`ha Y]ghYfgW`UZh`UbZ0`fh"8Yf`5VghUbX  
ni`Bcff]g`VYhf`À[ h`YXcW`]a`a Yf`bcW`+`\$`Di b\_hYž`k Ug`]b  
5bVYhfUW`h`XYf`Y`hnhYb`Z0bZF`YbbYbž`X]Y`J YfghUddYb`b]W`h  
[ Yk ]bbYb`\_cbbhYž`Y]bY`\_f]h]gW`Y`G]hi`Uh]cb`XUfghY``h" `A Uf\_c`ZcfXYfh  
X]Y`HYW`b]\_Yf`gY]bYg`HYUa`g`Ui`Zž`\_fYUh]j Y`@0gi b[ Yb`ni`Z]bXYb.  
BYi ba`U`Nk`Y]hYf`k`YfXYb`fY]W`h`b]W`h" `8Yf`8fi W\_`Ui Z`XUg`HYUa  
Yf\0`h`g]W`ž`XU`]b`XYf`?`cbghfi`\_hYi`fg!K`A`XYf`J`cfgdfi`b[ `Ui`Z  
A W@UFYb`a`]h`bi`f" ` \$`Di b\_hYb`a`]b]a`U`]gh"

J YfghUddYb`V`Y]Vh`[ Y`UggYb

A Ul`J YfghUddYbž`XYf`XfY]a`U`][ Y`K Y`ha Y]ghYfž`nY][ hY`g]W`hfc`hn

XYf`YbhhÀi gW\YbXYb`@Y]ghi b[ ` [ Y`UggYb" 8]YgYg`K cW\YbYbXY  
k Uf`Y]bZUW\`Y]b`gW\`YW\hYg`K cW\YbYbXY"5VYf`X]Y`YmhYb`dUUF  
F YbbYb`k UfYb`gW\cb`b]W\h`k ]f`\_]W\`ZUbhUgh]gW\ ž`gU[ hY`XYf  
B]YXYf`ÀbXYf`i bX`ZØ[ hY`Ubž`XUgg`X]Y`@U[ Y`VYgcf[ b]gYffY[ YbX`gY]"  
8YbbcW\`fi Zh`Yf`XUni`Ui Z`b]W\h`]b`DUb]\_`ni`j YfZU`Yb.`K ]f  
k ]ggYbž`XUgg`k ]f`b]W\h`]b`DUb]\_`j YfZU`Yb`a ØggYb"K ]f`j Yfgi W\Ybž  
X]Y`G]hi Uh]cb`ni`j YfVYggYfb"; YbUi`XUfUb`UfVY]hYb`k ]f"

8]Y`<YfUi gZcfXYfi b[ Ybž`a ]h`XYbYb`XUg`HYUa`\_`cbZfcbh]Yfh]ghž  
k YfXYb`]a a Yf`XYi h]W\Yf"K À\fybX`X]Y`?cb\_i ffYbn`i a`Bcff]g  
i bX`A W@UfYb`ni bY\`a YbX`Xfi W\_j c`Yf`k ]fXž`a i gg`FYX`6i ``gY]bY  
GhfUhY[ ]Y`ØVYfXYb`\_Yb`i bX`]bbcj Uh]j Yf`k YfXYbž`i a`XYb`j Yf`cfYb  
[ Y[ Ub[ YbYb`J cfgdfi b[ `ni fØW`ni [ Yk ]bbYb"

Bcff]g`gY`Vgh`VYhfUW\hYh`X]Y`G]hi Uh]cb`bØW\hYfb" `Hfchn`gY]bYg  
G]Y[ Yg`V`Y]Vh`Yf`fYU`]gh]gW\`]b`6Yni [ `Ui Z`X]Y; YgUa hk Yfhi b[ " `W  
\UVY`XUg[ Ubni`j\`f`ØVYf`\Ufh[ YUfVY]hYh`i bX`]Y[ Y`]a a Yf`bcW\  
+`\$`Di b`\_hY`\]bhYf`A UI " `9g`]gh`U`gc`n]Ya`]W\`Xi a a ž`a `A ca Ybh`Ub  
]f[ YbXYhk Ug`ni`XYb`\_Yb" `W [ Y\Y`Y]b`FYbbYb`bUW\`XYa`UbXYfYb  
Ub`i bX`a UW\Y`gc`k Y]hYf`k ]Y`V]g\Yfž`XYbb`Yg`\Uh`\_Y]bYb`G]bbž`Ub  
XYb`FYghni`XYb`\_Yb" `8Yf`]gh`a ]f`]a `A ca Ybh`j Ø``][ `Y[ U` žYf`\_`ÀfhY  
Yf"

HYW\ b]gW\ Y`<YfUi gZcfXYfi b[ Yb`ZØf`FYX`6i ``

8]Y`j Yf[ Ub[ YbYb`FYbbYb`\UVYb`[ YnY][ hž`XUgg`FYX`6i ``]j cf  
j ]Y`ZÀ`h][ Yb`hYW\ b]gW\ Yb`<YfUi gZcfXYfi b[ Yb`ghY\hž`X]Y`g]W\  
a Ø[ `]W\Yfk Y]gY`Ui Z`X]Y`b`ÀW\ghYb`K YhhVYk YfVY`Ui gk ]f`\_Yb  
\_ØbbhYb" `9]bY`GhfUhY[ ]YUbdUggi b[ `YfgW\Y]b`hi bYf`Àgg`]W\ž`XU  
gY`Vgh`Gd]hnYbZU\`fYf`k ]Y`J YfghUddYb`b]W\h`XUg[ Yk ØbgW\hY  
9f[ YVb]g`Yfn]Y`Yb`\_`cbbhYb" `C\`bY`b`bcj Uh]cb`i bX`5bdUggi b[  
\_ØbbhY`FYX`6i ``]a Ø[ `]W\Yfk Y]gY`gY]bY`Xca ]bUbhY`Dcg]h]cb`]a  
A chcfgcdcfhj Yf`]YfYbž`]bgVYgcbXYfY`Ub[ Yg]W\hg`XYf`?cb\_i ffYbn  
Xi fW\`A W@UfYbž`X]Y`Ub`gW\Y]bYbX`\_`cb]bi ]Yf`]W\`Ub`GhÀf`\_Y  
[ Yk ]bbYb"

A Uf`\_`c`i bX`J YfghUddYb`g]bX`g]W\`Y]b][ ž`XUgg`Yg`YbhgW\Y]XYbX`]ghž  
X]Y`f]W\h][ Yb`GW\ f]hY`ni`i bhYfbY\`a Ybž`i a`X]Y`DfcV`Ya`Y`ni

UbU`mg]YfYb`i bX`@Øgi b[ Yb`ni `Z]bXYb" `8 ]Y`bÅW ghY  
<YfUi gZcfXYfi b[ `k UfhYh`VYfY]hg`VY]`XYb`\_ca a YbXYb`F YbbYbž`k c  
XYf`8 fi W\_`Ui ZXUg`HYUa `k Y]hYf`k UW`gYb`k ]fX"

⇒ XYf`K Y`h`XYg`A c h c f g d c f h g`]gh`Yg`b]W`h`bi f`X]Y` ; YgW`k ]bX][ \_Y]hž  
X]Y`n`Å`hž`gcbXYfb`Ui W`X]Y` : Å`][ \_Y]hž`g]W`g`W`bY`U`bni dUggYb  
i bX`i bhYf`8 fi W\_`ni `fYU[ ]YfYb" `8 ]Y`bÅW ghY`NY]h`k ]fX  
YbhgW`Y]XYbX`gY]bž`b]W`h`bi f`ZØf`X]Y` : U`fYfž`gcbXYfb`Ui W`X`ZØf`XUg  
[ YgUa hY`HYUa `j cb`F YX`6i ``9g`V`Y]Vh`UVni k UfhYbž`k ]Y`XUg  
HYUa `X]Y`U`\_hi Y`Y`G]hi Uh]cb`VYk Å`h][ Yb`k ]fX`i bX`cV`Yg`]b`XYf  
@U[ Y`gY]b`k ]fXž`X]Y`]bhYfbY`8 mbUa ]\_`ni `j YfVYggYfb"

9f[ YVb]ggY`XYf`j Yf[ Ub[ YbYb`F YbbYb`i bX  
]\fY`6YXYi hi b[

8]Y`9f[ YVb]ggY`XYf`Y`hnhYb`ZØbZ`F YbbYb`UVYb`XYi h`]W`Y`HfYbXg  
Ui Z[ YnY][ hž`X]Y`gck c`ZØf`J YfghUddYb`U`g`Ui W`X`ZØf`XUg`F YX`6i ``!  
HYUa `5b`Ugg`ni f`Gcf[ Y`[ YVYb" `K Å`fYbX`J YfghUddYb`]b`XYf  
YfghYb`< Å`ZhY`XYf`GU]gcb`Xca ]bUbh`k Ufž`UVYb`g]W`X]Y  
@Y]ghi b[ Yb`]b`XYb`Y`hnhYb`F YbbYb`ghUf`\_j YfÅbXYfh" `Gc`VY`Y[ hY  
XYf`K Y`ha Y]ghYf`VY]`XYb`Y`hnhYb`XfY] ; fUbX`Df]l`Y]ba U`XYb  
nk Y]hYb`D`Uhn`i bX`nk Y]A U`gc[ Uf`XYb`Xf]hhYb`D`Uhn" `8 ]YgY  
9f[ YVb]ggY`nY][ Ybž`XUgg`XUg`HYUa `hfch`Y]bYf`k Ufa Yb  
5bZUb[ gd`UgY`GW`k ]Yf][ \_Y]hYb`U`hž`X]Y`Gd]hYb`d`c`g]h]cb`ni  
U`hYb"

⇒ J Yf[ `Y]W`XUni `U`h`A W`UfYb`]b`XYb`Y`hnhYb`F YbbYb  
g][ b]Z`\_UbhY` : c f h g W`f]hY`[ Ya UW`h" `6YgcbXYfg`@UbXc`B`c`ff]g`U`h  
a ]h`gY]bYa `G]Y[ `]b`NUbXj c`c`f`h`Y]b`ghUf`\_Yg`NY]W`Yb`[ YgYhnhž`XUgg  
X]Y`?cb`\_i ffYbn`Ui Z`c`h" `8 ]Y`GhY][ Yfi b[ `XYf`@Y]ghi b[ `j cb  
A W`UfYb`\_ØbbhY`Ui ZY]bY`YfZc`[ fY]W`Y`K Y]hYfYbhk ]W\_`i b[ `]\fYf  
: U`fnYi [ hYW`b]\_`]\]bk Y]gYbž`k Ug`F YX`6i ``XUni `nk ]b[ hž`]\fY  
GhfUhY[ ]Y`i bX`HYW`b]\_`ni `ØVYfXYb`\_Yb"

HYW`b]gW`Y`< YfUi gZcfXYfi b[ Yb`i bX  
9bhk ]W\_`i b[ Yb`VY]`F YX`6i ``

9]bY`XYf`[ f0» hYb`<YfUi gZcfXYfi b[ Ybžj cf`XYbYb`FYX`6i ``ghY\hž  
]gh`X]Y`gh`AbX][ Y`J YfVYggYfi b[ `]\fYf` : U\fnYi [ hY\Wb]\_`"8 Ug`HYUa  
\Uh]b`XYf`J Yf[ Ub[ Yb\Y]h`ØVYffU[ YbXY`@Y]ghi b[ Yb`[ YnY][ hžUVYf  
X]Y`?cb\_i ffYbn`\Uh]b]W\h`[ YgW\`UZyb"@Ui h`bZcfa Uh]cbYb`j cb`  
**F Y X`6i ``\UVYb`X]Y`b[ Yb]Yi fY`VYfY]hg`a Y\fyfy`bYi Y**  
9bhk ]W\_i b[ Yb`]b`6YhfUW\h`[ Ync[ Ybž`i a`X]Y`@Y]ghi b[ `XYg`5i hcg  
]b`XYb`j YfV`Y]VYbXYb`GU]gcbfYbbYb`ni`cdh]a ]Yfyb"

8 Yf` : c\_i g`]Y[ hi bhYf`UbXYfYa`Ui Z`XYf`5YfcXmbUa ]\_i bX`XYf  
 : U\fnYi [ UVgh]a a i b[ ži a`g]W\Yfni ghY``Ybž`XUgg`J YfghUddYb  
k ]YXYf`X]Y`[ Yk ØbgW\hY`GW\ bY``][ \_Y]hi bX`GhUV`]h`h`]a`F YbbYb  
\Uh`b`XYf` : cfa Y`%`]gh`hY\Wb]gW\Yg`?bck !\ck`YbhgW\Y]XYbXž  
i bX`XUg`HYUa`ghY\h`j cf`XYf`<YfUi gZcfXYfi b[ ž`]\fY`Yfgh`\_Ugg][ Y  
@Y]ghi b[ `ni`VY\Ui dhYb`"8]Y`b[ Yb]Yi fY`a`ØggYb`b]W\h`bi f`X]Y  
hY\Wb]gW\Yb`5gdY`\_hY`XYg`5i hcg`cdh]a ]Yfybž`gcbXYfb`Ui W\  
g]W\YfghY``Ybž`XUgg`X]Y` : U\fyf`j c``i bX`[ Ubn`Ui Z`XUg` : U\fnYi [ j  
YfhfUi Yb`\_ØbbYb"

## 5\_hi Y``Y`A Uf\_hUbU`mgYb`i bX Ni gW\Ui Yf]bhYfYggY

8]Y` : cfa Y`%\Uh]b`XYb`YmhYb`b\YfYb`Y]b`VYa Yf\_Yb`gk YfhYg  
K UW\ghi a`]b`6Yni [ `Ui Z`Ni gW\Ui YfnU\`Yb`i bX`\_ca a Yfn]Y``Y  
b`hYfYggYb`Yf`YVh`@Ui h`XYa`**cZZ]n]Y``Yb` : %!DcfhU`g]bX`X]Y**  
9]bgW\U`hei chYb`ZØf`F YbbØVYfhfU[ i b[ Ybž`]bgVYgcbXYfY`]b  
9i fcdUž`g][ b]Z\_Ubh`[ Ygh]Y[ Yb`"8]YgYg`k UW\gYbXY`b`hYfYggY`\Uh  
b]W\h`bi f`X]Y`Gdcbgc`fYbY]bbU\ a Yb`Yf\Ø\hž`gcbXYfb`Ui W\`X]Y  
9fk Ufhi b[ `Ub`X]Y`HYUa`gž`\cW\`\_Uf`h`][ Y`@Y]ghi b[ Yb`ni`YfVf]b[ Yb`"

9]bY`i a ZFU[ Y`XYg`A Uf\_hZc`fgW\i b[ gi bhYfbY\`a Ybg`B]Y`gYb`nY][ hYž  
XUgg`ØVYf`\* \$i`XYf`6YZFU[ hYb`Ub` : cfa Y`!%`F YbbYb`]bhYfYgg]Yfh  
g]bXž`k Ug`g]W\`dcg]h]j`Ui Z`X]Y`J Yfa Uf\_hi b[ gghfUhY[ ]Y`i bX  
Gdcbgc]b[ a Ø[ `]W\`\_Y]hYb`XYf`HYUa`g`Ui gk ]f\_h`"8]Y`6Y[ Y]ghYfi b[  
j cb` : Ubg`i bX`Gdcbgc`fYb`\_ØbbhY`XUni`VY]hfU[ Ybž`XUgg`F Y X`6i ``  
i bX`UbXYfY`HYUa`g`i bhYf`8fi W`\_ghY\Ybž`]\fY`@Y]ghi b[  
\_cbh]bi ]Yf`]W\`ni`ghY][ Yfbž`i a`XYf`B UW\ZFU[ Y`[ YfYW\h`ni`k YfXYb`"

6Ygi W\Yb`G]Y`i bg`Ui Z.`X]Y!bUW\ f]W\ hYb"bYh