

%, `]bhYfYggUbhY': U\_hYb`ØVYf`æfXUb]Yb

K ]f`hY]`Yb`X]Y`]bhYfYggUbhYghYb': U\_hYb`ØVYf`æfXUb]Ybž`X]Y`  
k ]f`VY]`i bgYfYa`6Ygi W` ]b`X]YgYa`VYnUi VYfbXYb`@UbX`  
[ Y`Yfbh`\UVYb`æfXUb]Yb`]gh`Y]bYg`a`Y]bYf`YVghYb`  
FY]gYn]Y`Y`Ui ZXYf`K`Y`h`9g`gW`Y]bh`U`Yg`ni` \UVYb`"5b`  
a`UbW`Yb`GhY`Yb`[ `Y]W`h`Yg`Y]bYa`': fY]`]W`ha`i`gYi`a`'a`]h`  
Ubh]\_Yb`Fi`]bYb`i`bX`'a`mh`]\gW`Yb`Gh`X`hYb`Ua`' <cf]ncbh`"9g`  
[ ]Vh`B`Uhi`fd`\`Àbca`YbY`i`bX`ZUgn]b]YfYbXY`5i`gV`]W`\_Yž`X]Y`XYb`  
HfUi`a`'Y]bYg': chc[ fUZYb`YfZØ`Yb`"8]Y`@`ÀbXYf`g]bX`j`cb`Y]bYf`  
; YgW`]W`hY`Xi`fW`Xfi`b[ Ybž`X]Y`gc`U`h]gh`k`]Y`X]Y`J`YfgY`XYf`  
6]VY`ž`i`bX`\UVYb`]b`XYb`[ fØ»`hYb`FY`][ ]cbYb`XYf`K`Y`h`Y]bY`  
k ]W`h][ Y`Fc`Y`[ Ygd]Y`h": Ø[ Yb`G]Y`\_Øgh]W`Y`?ØW`Y`i`bX`  
Y]b`UXYbXY`9]b`Y]a`]gW`Y`\]bni`ž`i`bX`G]Y`\UVYb`Y]b`  
k`i`bXYfVUfYg`/`Ua`d`^Y`"d`/`

K ]f`hY]`Yb`X]Y`]bhYfYggUbhYghYb': U\_hYb`ØVYf`æfXUb]Ybž`X]Y`k ]f`VY]`  
i bgYfYa`6Ygi W` ]b`X]YgYa`VYnUi VYfbXYb`@UbX`[ Y`Yfbh`\UVYb`

æfXUb]Yb`]gh`Y]bYg`a`Y]bYf`YVghYb`FY]gYn]Y`Y`Ui ZXYf`K`Y`h`9g`  
gW`Y]bh`U`Yg`ni` \UVYb`"

5b`a`UbW`Yb`GhY`Yb`[ `Y]W`h`Yg`Y]bYa`': fY]`]W`ha`i`gYi`a`'a`]h`  
Ubh]\_Yb`Fi`]bYb`i`bX`'a`mh`]\gW`Yb`Gh`X`hYb`Ua`' <cf]ncbh`"9g`[ ]Vh`  
B`Uhi`fd`\`Àbca`YbY`i`bX`ZUgn]b]YfYbXY`5i`gV`]W`\_Yž`X]Y`XYb`HfUi`a`  
Y]bYg': chc[ fUZYb`YfZØ`Yb`"

8]Y`@`ÀbXYf`g]bX`j`cb`Y]bYf`; YgW`]W`hY`Xi`fW`Xfi`b[ Ybž`X]Y`gc`U`h`  
]gh`k`]Y`X]Y`J`YfgY`XYf`6]VY`ž`i`bX`\UVYb`]b`XYb`[ fØ»`hYb`FY`][ ]cbYb`  
XYf`K`Y`h`Y]bY`k ]W`h][ Y`Fc`Y`[ Ygd]Y`h": Ø[ Yb`G]Y`\_Øgh]W`Y`?ØW`Y`  
i`bX`Y]b`UXYbXY`9]b`Y]a`]gW`Y`\]bni`ž`i`bX`G]Y`\UVYb`Y]b`  
k`i`bXYfVUfYg`FY]gYn]Y`j`c`Yf`5VYbhYi`Yf`i`bX`bhf][ Yb`"

K ]f]j YfvfUW hYb`Y]b`dUuf`K cW`Yb`XUa ]hž`XUg`@UbX`ni`VYfY]gYb  
i bX`gY]bY`K ØghYbž`A YfY`i bX`Gh`ÀXhY`ni`Yf`\_i bXYb`"i bhYfk`Y[ g  
\UVYb`k ]f`Y]b][ Y`]bhYfYggUbhY` : U\_hYb`ØVYf`æfXUb]Yb  
Ui Z[ YgW`bUddhž`j cb`XYbYb`k ]f`X]Y`VYghYb`i bhYb`hY]`Yb`"

⇒bhYfYggUbhY` : U\_hYb`ØVYf`æfXUb]Yb

% " 8Yf`cZZ[n]Y`Y`B`Ua`Y`æfXUb]Ybg`]gh`<UgW`Ya`]h]gW`Yg  
?`Øb][ fY]W`æfXUb]Yb`"fE`i`Y`Y`.`667Ł

&" æfXUb]Yb`[ ]b[ `Ui`g`XYf`HY]`i`b[ `XYg`B`U`Yb`C`ghYbg`Xi`fW`  
;`fc»`Vf]hUbb]Yb`i`bX` :`fUb`\_fY]W`b`UW`X`Ya` `9fghYb`  
K`Y`h`\_f]Y[ `Y`fj`c`f`"GY]h`%-`&&`U`g`HfUbg`æfXUb]Yb`VY`\_Ubbhž`  
k`i`fXY`Yg`%-`(`\*`j`cb`XYf`i`B`C`cZZ[n]Y`U`g`i`bUV`Àb[ ]][ Yg  
gci`j`Yf`ÀbYg`?`Øb][ fY]W`\_UbYf`\_Ubbh`"fE`i`Y`Y`.`667Ł

' " 9`"@Uk`fYbW`ž`VYggYf`VY`\_Ubbh`U`g`@Uk`fYbW`j`cb`5fUV]Ybž`  
VYf]Yh`X]Y`5bZ`Ø`fYf`XYf` ;`fc»`Yb`5fUV]gW`Yb`F`Yj`c`hY`]b`  
æfXUb]Yb`k`À`fYbX`XYg`9fghYb`K`Y`h`\_f]Y[ `g`Yb[ `""8]Y`  
F`Yj`c`hY`[ ]dZ`hY`]a` ,`VYffUgW`i`b[ `gUb[ `f]ZZ`i`bX`XYf`  
B]YXYf`U[ Y`XYf`h`Øf\_]gW`Yb`GhY]h`\_f`À`ZhY`]b`XYf`GW`UW`h`  
j`cb`5eUVUž`X]Y`Ui`g`XYf`B`À`Y`[ YZ`Ø`fh`k`i`fXY`K`UX]`F`i`a` "  
fE`i`Y`Y`.`7BBŁ

`U`h1` ]bhYfYggUbhY`ZU\_hYb`ØVYf`æfXUb`Uk`fYbW`j`cb`UfUV]Yb`  
%`2` ;`Ya`Y]bZfY]`C`VYfghY`i`hbUbh`H`ca`Ug`9Xk`UfX`@Uk`fYbW`

% " 8]Y`6Yj`Ø`\_Yfi`b[ `j`cb`HfUbg`æfXUb]Yb`VYghUbX`  
[`fØ»`hYbhY]`g`Ui`g`Gh`A`a`Ybž`X]Y`Ub`XYf` ;`fc»`Yb`5fUV]gW`Yb`  
F`Yj`c`hY`[ Y[ `Yb`XUg`C`ga`Ub]gW`Y`F`Y]W`hY`[ `Ybca`a`Yb`  
\UhYb`" `æ`a`a`cXYfbYb`æfXUb]Yb`g]bX`X]YgY`i`fY]bk`c`bYfž`  
X]Y`U`g`C`ghVUb`\_!`æfXUb]Yb`VY`\_Ubbh`g]bXž`XYb`  
B`UW`\_ca`a`Yb`d`U`À`gh]bYbg]gW`Yf` :`ØW`h]b[ Y`Ui`g`g`fUY`  
i`bX`XYf`K`YghVUb`\_n`U`Yba`À»][ `i`bhYf`Y[ `Yb`"fE`i`Y`Y`.  
667Ł

&" æfXUb]Yb`U`h`Y]bY`U`b[ Y` ;`YgW`]W`hY`XYf`5i`ZbU`a`Y`j`cb`  
 :`ØW`h]b[ `Yb`" `æ`a`]hYb`j`cb`Hi`fVi`Y`bnYb`dcg]h]cb]Yfhž`U`h`  
Yg`Y]bY`[ `fc»`Y`5bnU`\_`j`cb` :`ØW`h]b[ `Yb`Ui`g`XYb`  
i`a`]Y[ `YbXYb`?`cbZ]\_hYb`Ui`Z[ `Ybca`a`Yb`"5a`  
VY`a`Yf`\_Ybgk`YfhYghYb`]ghž`XUgg]a`@UbX`gW`À`hni`b[ `gk`Y]gY`

nk Y]`A ]`]cbYb`DU`Àgh]bYbgYf`i bX`%ž( `A ]`]cbYb`gmf]gWXY  
: `ØW`h`b[ `Y`YVYb`" `b`Y]bYa `@UbX`a ]h`bi f`- ž) `A ]`]cbYb  
9]bk c`bYfb`Yb`hgd]W`h`X]Yg`a Y`f`U`g`Y]bYa `8f]hh`Y`XYf  
6Yj Ò`\_Yfi b[ "fE i Y`Y. `HY`Y[ fUd`ł

' " `xfXUb]Yb`]gh`X]Y`<Y]a Uh`XYf`Ubh]\_Yb`GhUXh`DYhfU`"6Y`\_Ubbh  
U`g` 8]Y`F`cgYbghUXh`ž]gh`g]Y`VYfØ`a`h`ZØf`]`fY`Y]bn][`Ufh][`Y  
5fW`j`hY`\_hi`fž`X]Y`X]fY`\_h`]b`X]Y`: Y`gk`UbX`[`Y`U`i`Yb`k`i`fXY`  
9g]gh`Ui`W`Y]b`I`B9G7C`!K`Y`h`\_i`hi`fYfVY`i`bX`Y]bYg`XYf  
bYi`Yb`+`K`Y`hk`i`bXYf`"fE i Y`Y. `I`B9G7C`ł

`U`h1 ]bhYfYggUbhY`ZU`\_hYb`ØVYf`c`fXUb`dYhfU` 25h`Ug`/`6c`chg  
DYhfU`]gh`X]Y`ZUgn]b]YfYbXghY`@UbXgW`UZh]b`Y]bYa `@UbX`j`c`Yf  
ZUgn]b]YfYbXYf`@UbXgW`UZhYb

%` 8]Y`Y`hnhYb`GnYbYb`j`cb`b`X]UbU`x`bYg`i`bX`XYf`Y`hnhY  
?fYi`nni`[`k`i`fXYb`]b`DYhfU`[`YXfY`h`fE i Y`Y. `A`68`ł

&` a` ;`Y[`Yb`gUhn`ni`XYb`UbXYfYb`UfUV]gWXYb`GhUUhYb`]a  
BU`Yb`C`ghYb`U`h`x`fXUb]Yb`\_Y]b`Y][`YbYg`^2`"fE i Y`Y.  
667ł

' " `8Ug`d`U`Àgh]bYbg]gWXY`;`YV]Yh`XYf`K`YghVUb`\_`k`Uf`Y]bgh`HY]`  
`xfXUb]Ybg`"BUW`XYa`UfUV]gW!]gfUY`]gWYb`?cbZ]\_h  
%-`(`,`!`(-`Ubby`\_h]YfhY`XUg`@UbX`XUg`K`Ygh`c`fXUb`UbX`  
j`Yf`cf`Yg`UVYf`]a`?f]Y[`%`-`\*`+`Ub`g`fUY`"fE i Y`Y. `667ł

(` " `BYVYb`Y`[`mdhYb`]gh`x`fXUb]Yb`Y]bY`j`cb`bi`f`nk`Y]  
UfUV]gWYb`BUh]cbYbž`X]Y`:`f]YXYb`a`]h`g`fUY`[`YgW`c`ggYb  
`UVYb`"%-`-`(`i`bhYfnY]W`bYhY`x`fXUb]Yb`Y]bYb  
:`f]YXYbgj`YfhfU[`a`]h`g`fUY`ž`XYf`XYb`(`\*`!`A`l`f][`Yb`c`Z]n]Y`Yb  
?f]Y[`gni`ghUbX`VYbXYhY`"fE i Y`Y. `667ł

`U`h1 ]bhYfYggUbhY`ZU`\_hYb`ØVYf`c`fXUb]Yb`]gfUY` 25h`Ug`/`6c`chg  
8]Y`@]W`hYf`g`fUY`g`j`ca`I`ZYf`XYg`HchYb`A`YYfYg]b`x`fXUb]Yb`Ui`g  
[`YgY`Yb

%` `xfXUb]Yb`]gh`X]Y`<Y]a Uh`j`]Y`Yf`V]V`]gWXYf`Gh`h`hYb`ž  
XUfi`bhYf`i`bhYf`UbXYfYa`XYf`x`fXUb`ž`k`c`X`gi`g`j`cb  
x`UbbYg`XYa`H`Ai`ZYf[`YhUi`Zh`k`i`fXY`ž`XYf`6Yf[`BYVc`ž`k`c  
A`cgYg`ghUfV`ž`gck`]Y`X]Y`gØbX][`Yb`Gh`X`hY`Gc`X`ca`i`b`X  
;`ca`c`ffU`"fE i Y`Y. `H`Y`C`I`Z`c`f`X`;`i`]XY`h`c`A`YbgWYb`i`b`X  
C`fhY`XYf`6]VY`ł

&" 8Yf'h]YZghY`Di b\_h'XYf'9fXY`]b'6Yni [ `Ui ZXUg': Ygh`UbX`]gh  
XUg'I ZYf'XYg'HchYb`A YYfYg`]b'æfXUb]Yb"9g`]Y[ h'(&\$`a  
i bhYf'XYa`A YYfYggd]Y[ Y`"fE i Y`Y. '6f]hUbb]WUŁ

' " 8Ug`K UggYf'XYg'HchYb`A YYfYg`]gh`YI hfYa`gU`n\U`h][ ž`k Ug  
XYb'6UXY[ ĀghYb`5i Zhf]YV`j Yf`Y\`h"A`h' ( ž&`i`GU`n[ Y\U`h  
]gh`Yg'- ž\*!a U`gc`gU`n][ `k`]Y`XUg`A YYf" fE i Y`Y. '6f]hUbb]WUŁ

`U`h1` ]bhYfYggUbhY` : U\_hYb`ØVYf`XUg`HchY`A YYf`]b  
æfXUb]Yb 2 5hUg/`Gh]YZY`GWk`ja a YbX`Ui ZXyf`CVYfZĀWXY`XYg  
HchYb`A YYfYg`

%" 9]bY`XYf`gY`hgUa`ghYb`HUhgUWXYb`ØVYf`æfXUb]Yb`]ghž`XUgg  
Yg`U`g`\`ÒZ]W` [ ]hž`XUg`5b[ YVch`Y]bYf`A U`\`nY]h`XfY]a U`  
UVni`Y\`bYbž`VYj`cf`a Ub`Yg`gW`]Y»`]W`Ubb]a a h" fE i Y`Y.  
HY`Y[ fUd\Ł

&" C\`bY`X]Y`&\*`\_a`f%\*`A Y]`YbŁ`Ub[ Y`? ØghY`Ybh`Ub[ `XYg  
FchYb`A YYfYg`k ĀfY`æfXUb]Yb`Y]b`6]bbYbghUUh" fE i Y`Y  
7`5`K`cf`X` : UWh`6cc\_Ł

' " 8]Y`BUh]cbU`ZU[ [ Y`j`cb`æfXUb]Yb`nY][ h`XfY][ `Y]WXY  
\`cf]ncbhU`Y`GhfY]ZYb`]b`GWk`Ufn`ffYdfĀgYbh]Yfh`XUg`? U`]ZUh  
XYf`5VVUg]XYbŁž`K`Y]»`ffYdfĀgYbh]Yfh`XUg`? U`]ZUh`XYf  
I`a`a`Umm]XYbŁi`bX` ; fØb`ffYdfĀgYbh]Yfh`XUg`? U`]ZUh`XYf  
: Uh]a`]XYbŁni`gUa`a`Yb`a`]h`Y]bYa`fchYb`[ `Y]WXYgWXYb\_]`[ Yb  
8`fY]YW`\_`Ui`ZXyf`<]gggY]hYž`XUg`X]Y` ; fc»Y`5fUV]gWXY  
F`Yj`c`hY`j`cb`%-`%\*`" fE i Y`Y. '7`5`K`cf`X` : UWh`6cc\_Ł

`U`h1` ]bhYfYggUbhY` : U\_hYb`ØVYf`X]Y` : `U[ [ Y`æfXUb]Ybg 2 5hUg/  
6cchg`æfXUb]Ybg` : `U[ [ Y`k`Y\`h`\cW

%" ɓ`XYf`A`]hhY`XYg`fchYb`8`fY]YW`\_g`VYZ]bXYh`g]WXY`Y]b  
g]YVYbnUW\_]`[ Yf`k`Y]»`Yf`GhYfbž`XYf`X]Y`g]YVYb`Gi`fYb  
fU`YfgYŁ`XYf`9fÒZ]bi`b[ `XYg`?`cfUbg`XUfghY`"h" fE i Y`Y. '7`5`  
K`cf`X` : UWh`6cc\_Ł

&" 8]Y`<`Ui`dhghUXhj`cb`æfXUb]Ybž`5`a`a`Ubž`\]Y»`Y]bgh  
D\]UXY`d\]U" `G]Y`k`i`fXY`bUW`Dhc`Ya`U]cg`D\]UXY`d\i`g  
f&, `!&(`\*`j`" `7`f"Ł`VYbUbbhž`XYf`X]Y`GhUX`h`k`Ā`\fYbX`gY]bYf

F Y [ ] Y f i b [ g n Y ] h ' k ] Y X Y f ' U i Z [ Y V U i h ' \ U h h Y ž ' V Y j c f ' 5 a a U b  
i a ' ' \$ ' j " ' 7 \ f " ' j c b ' < Y f c X Y g ' Y ] b [ Y b c a a Y b ' k i f X Y ' i b X  
i b h Y f ' X Y b ' 9 ] b Z i g g ' F c a g ' Z ] Y " ' f E i Y ' ' Y . ' 6 f ] h U b b ] W U Ł

K Y ] h Y f Y ' ] b h Y f Y g g U b h Y ' : U \_ h Y b ' Ø V Y f ' æ f X U b ] Y b ' Z ] b X Y b ' G ] Y ' ] a ' @ c b Y ' m  
D ' U b Y h ; i ] X Y ' h c ' æ f X U b "

@ Y ] h V ] ' X . ' 5 h U g / ' 6 c c h g

.

8 Y h U ] ` g

6 Y g i W X Y b ' G ] Y ' i b g ' U i Z . ' Y ] b Y ! f Y ] g Y " X Y