

8 f" >Øf[ Yb ; YfXYg. " \$ :>U\ fY 'B Uhi fgW\ i hn  
]b '6Ua VYf[ 'i bX 'gY]bY '5b ZÀb[ Y

8 f" >Øf[ Yb ; YfXYg'fYZY\_h]Yfh'bUW " \$ :>U\ fYb'U`g  
B Uhi fgW\ i hnVYUi ZhfU[ hYf']b'6Ua VYf[ 'ØVYf'9fZc`[ Y'i bX  
< YfUi gZcfXYfi b[ Yb'ZØf'XYb'B Uhi fgW\ i hn"

B UW " \$ :>U\ fYb'i bYfa ØX`]W\ Yb'9b[ U[ Ya Ybhg'ZØf'XYb  
B Uhi fgW\ i hn]b'6Ua VYf[ 'j YfUVgW\]YXYh'g]W\ '8 f" >Øf[ Yb ; YfXYg]b  
XYb'F i \YghUbX" '9]b'D]cb]Yfž'XYf']b'XYb'ZfØ\Yb'%- - \$Yf'>U\ fYb'U`g  
YfghYf'\Ui dhUa h]W\ Yf'B Uhi fgW\ ØhYf']b'XYf'GhUXh'VY[ Ubbž'V`]W\_h  
Yf'Ui ZY]bY'NY]h'ni fØW\_ž'X]Y'[ YdfÀ[ h'k Uf'j cb'k Yfhj c`Yb  
9bhXYW\_i b[ Yb'i bX'VYXYi hYbXYb'J YfÅbXYfi b[ Yb]a '6YfY]W\ 'XYg  
B Uhi fgW\ i hnYg"

þ'gY]bYa 'F ØW\_V`]W\_VYgW\ fY]Vh; YfXYg'ZUgn]b]YfYbXY'9f'YVb]ggYž  
X]Y'Yf']a 'F U\ a Yb'gY]bYf'Ya hYf'\UhhY"'9]bY'XYf'Y]bXfi W\_gj c`ghYb  
9bhXYW\_i b[ Yb'k À\ fYbX'gY]bYf'@Ui ZVU\b'k Uf'XYf'K UW\ hY`\_Øb][ ž  
Y]b'[ YZÀ\ fXYhYf'6fi hj c[ Y'ž'XYf'Ub[ Y'NY]h]b'8Yi hgW\ 'UbX'b]W\ h  
[ YgY\Yb'k i fXY"'þ'XYb'%- - \$Yf'>U\ fYbž'k À\ fYbX'Y]bYf'9f\_i bXi b[  
a ]h'H\ca Ug'GhU\`j ca '@UbXYgVi bX'ZØf'J c[ Y`gW\ i hnž'VYa Yf\_hYb  
g]Y]b'XYf'GØXZi f'Ua 'GYbXY'VUW\ 'XfY]'fi ZYbXY'A ÅbbW\ Yb"'8Yf  
K UW\ hY`\_Øb][ ž'XYf'ni j cf']b'8Yi hgW\ 'UbX'j YfgW\ k i bXYb'k Ufž  
k i fXY'Xi fW\ 'X]Y'HYW\ b]\_XYg'HcbVUbXUi ZbY\ a Ybg'Ub[ Y`cW\_h"  
8 Ug'6]X'X]YgYf'; Y[ YVYb\Y]h'V'Y]Vh'i bj Yf[ YggYbž'U`g'XUg'H]Yf  
hUhgÅW\`]W\ 'V]g'ni ']\ fYb': Ø» Yb'\_Ua "

6Y[ Y[ bi b[ Yb'a ]h'XYf'B Uhi f

8]Y'F ØW\_\_Y\ f'XYg'K UW\ hY`\_Øb][ g'k Uf''Y]XYf'bi f'j cfØVYf[ Y\YbXž  
XU'XUg'K Y]VW\ Yb'ZY\ 'hY'i bX'X]Y'A ÅbbW\ Yb'UVk UbXYfhYb"  
8YbbcW\ '[ ]Vh'Yg'Ui W\ 'YfZfYi `]W\ Y'F ØW\_\_Y\ fYfž'k ]Y'XYb'Ghc fW\ ž

XYf'bUW\Y]bYf'5Vk YgYb\Y]hj cb '%&\$'x\lfYb'k ]YXYf'Ui ZY]bYa  
6UfcW\\_chY''b]ghYh''8 ]YgY'F ØW\\_Y\]'gh'ZØf'; YfXYg'b]W'h'bi f'Y]b  
NY]W\Yb'ZØf'dcg]hj Y'J YfÅbXYfi b[ Ybž'gcbXYfb'Ui W\Y]bY  
dYfgØb`]W\Y'6Y'c\bi b[ 'ZØf'gY]bYb'U\fnY\bhY'Ub[ Yb'9]bgUhn"  
Hfc hn'XYf'F ØW\\_Y\]'Y]b\Y]a ]gW\Yf'5fhYb']gh'XUg'D\Åbca Yb'XYg  
5fhYbk UbXY'g'gdØfVUf''Gc'n]Y\Yb'\Yi hY'Ui W\ 'bYi Y'5fhYb'k ]Y'X]Y  
#U']Yb]gW\Y'GW\ØbgW\fyW\\_Y'i bX'<c'nV]YbYb']b'X]Y'FY[ ]cbž'k Ug  
ZØf'; YfXYg'YXcW\\_'Y]b'; fi bX'ni f'Gcf[ Y']gh''9f'g]Y\hY]bY  
dchYbn]Y''Y'Ni bU\ a Y'XYf'5fhYbj ]Y'ZU'h'Xi fW\X]Y'\_'ja Uh]gW\Yb  
J YfÅbXYfi b[ Ybž'Ui W\ 'k Ybb'X]Yg'bYi Y'<YfUi gZcfXYfi b[ Yb'a ]h  
g]W\ 'vf]b[ hž'VYgcbXYfg'ZØf'5fhYbž'X]Y' ]b '\Ø\YfYb '@U[ Yb''VYb"

6Ua VYf[ 'U'g'GhUX'h'ghY\h''Ui h'; YfXYg'VY]a 'BUhi fgW\i hn'[ i h'XU"  
8]Y'[ Yc[ fUd\]gW\Y '@U[ Y'i bX'X]Y'6Ya Ø\i b[ Yb'XYg  
GhUXhd'Ubi b[ gUa hYgž'xXi ghf]YVfUW\Yb']b'K c\bj ]YfhY'  
i a ni k UbXY'bž'\UVYb'Dcg]hj Yg'VYk ]f\_h''; YfXYg'\YVh'VYgcbXYfg  
X]Y'bUW\U'h][ Y'D'Ubi b[ ' ]b'XYf'GhUX'h\Yfj cfž'X]Y'Yg'Yfa Ø[ ' ]W\h  
\Uhž'bUhØf']W\Y'FYggci fW\ 'b'ni 'Yf\U'hYb" 'a '<]bV' ]W\\_Ui ZX]Y  
: 'ÅW\Y']gh'6Ua VYf[ 'Y]bY'XYf'\_'Y]bghYb'GhÅXhY' ]b'6UmYfbž'YXcW\  
[ ]Vh'Yg]a a Yf'k ]YXYf'<YfUi gZcfXYfi b[ Ybž'X]Y'Xi fW\ 'XYb  
ghÅXh]gW\Yb'6cca 'YbhghY\Yb''8 ]YgY'8 ]W\hY'YfZcfXYfh'Y]bY  
VYgcbXYfg'VY\i hgUa Y'<UbX\UVi b[ ' ]a 'I a [ Ub[ 'a ]h'XYb  
j cf\UbXYbYb': 'ÅW\Yb"

## 8 ]Y'Ni \_i bZh'XYg'B Uhi fgW\i hnYg']b'6Ua VYf[

5b[ YgdfcW\Yb'Ui ZXyb'9]bZi gg'XYg'?`ja Uk UbXY'gž'Yf'Åi hYfh  
; YfXYgž'XUgg'X]Y'Xi fW\ 'XYb'?`ja Uk UbXY''j Yfi fgUW\hY  
: 'ÅW\Ybj Yfg]Y[ Y'i b[ 'Y]b'YfbghYg'DfcV'Ya 'XUfghY''h''5i W\ 'k Ybb  
a Y\f'5fhYb']b'XYf'FY[ ]cb'Ub[ Yg]YXY'h'k YfXYbž'g]bX'g]Y'Ui Z  
YbhgdFYW\YbXY '@VYbgfÅi a Y'Ub[ Yk ]YgYb''; YfXYg'XfÅb[ h'XU\Yf  
XUfUi Zž'XUgg'X]Y'J Yfg]Y[ Y'i b[ 'b]W\h'k Y]hYf'Ub\Å'h'i bX'VYhfUW\hYh  
XUVY]XYb[ 'cVU'Yb'FØW\_[ Ub[ 'XYf'5fhYbj ]Y'ZU'h'a ]h'Gcf[ Y''8Yf  
hfcd]gW\Y'FY[ Ybk U'Xž'U'g'<Y]a Uhj ]Y'Yf'5fhYbž'Y]XYh'ghUf\_'i bhYf  
XYf'5V\c'ni b[ 'i bX']gh'ZØf'; YfXYg'Y]b[ 'fc»Yg'5b`Y[ Yb"

8 ]Y'DfcZYgg]cbU`]g]Yfi b[ 'XYg'B Uhi fgW\i hnYg']b'6Ua VYf[ ' ]gh'Y]b  
YfghYf'GW\ f]hž'i a 'XYb'bYi Yb'5bZcfXYfi b[ Yb[ 'YfYW\h'ni 'k YfXYb"

ϕ·XYb`YhnhYb`ϕ\fnY\bhYb`Uhg]W`XYf`BUhi fgW`i hn`]b`XYf`GhUXh  
Yf\YV`]W`k Y]hYfYbhk ]W\_Y`hi bX`]gh`bi b`]b`j ]Y`Yb`6YfY]W`Yb  
fYW`h]W`ghfi \_hi f]Yfh`8]Yg`Vf]b[ h`Ui W`XYb`6YXUfZ`Ub`a Y`f  
DYfgcbU`a ]hg]W`ž`k Ug`Z0f`X]Y`GhUXh`Y]bY`<YfUi gZcfXYfi b[  
XUfghY`h`8Yf`9fZc`[ `X]YgYf`6Ya 0\i b[ Yb`nY][`hg]W`]a  
Yi fcd`A]gW`Yb`GW`i hn[ YV]YhgmgghYa `BUhi fU`&\$\$ž`XUg`Ui W`Y]b  
VYXYi hYbXYg; YV]Yh`]bbYf\U`V`XYf`GhUXh`i a ZUggh"

; YfXYg`g]Y`h`X]Y`GhUXh`]b`XYb`ni \_0b`Zh[ Yb`ϕ\fnY\bhYb`gck c`\`U`g  
[ f0bYfYb`Cfh`U`g`Ui W`VYn0[ `]W`XYf`BUhi fgW`i hnVYa 0\i b[ Yb  
Ui ZY]bYa `dcb]hj Yb`k Y[ "9g`[ ]Vh`bcW`j ]Y`Y`:``AW`Ybž`X]Y`ni f  
6Y[ f0bi b[ `ni f`J`YfZ0[ i b[ `ghY`Ybž`i bX`Yf`g]Y`h[ fc»Yg`DchYbn]U`ž  
Ui W`k Ybb`XYf`; YXUb`\_Yž:``AW`Yb`k ]Y`k `AbXY`cXYf`8`AW`Yf`ni  
bi hnYbž`b]W`h]a a Yf`dcdi `Af`]gh"

GY]bY`9a dZY`\`i b[ Yb`Z0f`BUhi f`]YV\UVYf`i a ZUggyb`XYb  
ghUXh0\_c`c[ ]gW`Yb`@Y`fdZUXž`XYf`Ua `A ]W`Y`gVYf[ `VY[ ]bbhi bX  
Y]bY`fY]nj c`Y`Hci f`ni `XYb`5`hYbVi f[ `V]YhYh`9]b`k Y]hYfYf  
@]YV`]b[ gcfh`Z0f`; YfXYg`]gh`XYf`U`hY`F`ch`c`Zž`k c`XUg`BUhi fXYb`\_a U`ž  
X]Y`[ fc»Y`@]bXYž`ghY`h`8]YgY`fi \][`Y`I`a [ YVi b[ `Yfa 0[ `]W`h`Y]bYb  
6`]W`\_Ui ZX]Y`5`hYbVi f[ ž`UVgY]hg`XYf`A`YbgW`Yba Yb[ Ybž`i bX  
V]YhYh]c`f`U`Ya `ni f`?]fgW`V`0hY`Y]b`k i bXYfgW`0bYg`6]X"

GY`Vgh`bUW` `` \$`ϕ\fyb`]a `8]Ybgh`XYg`BUhi fgW`i hnYg`V`Y]Vh`8f"  
ϕf[ Yb`; YfXYg`bUW`XYb`]W`0VYf`X]Y`J]Y`nU`\`Ub`H\Ya Yb`i bX  
<YfUi gZcfXYfi b[ Ybž`X]Y`Yg`ni `VYk `A`h[ Yb`[ ]h`GY]b`6`]W`\_V`Y]Vh  
Ui ZX]Y`BUhi f`[ Yf]W`hYhž`i bX`gY]b`9fVY`k ]fX`j cb`XYb`bYi Yb  
A ]hUfVY]hYfb`Zcfh[ YZ0\fhž`X]Y`VYfY]hg`Ui Z`gY]bY`9I`dYfh]gY  
Ui ZVUi Yb`k YfXYb`"GY]b`9b[ U[ Ya Ybhi bX`gY]bY`9bhXYW`i b[ Yb  
k YfXYb`]b`XYf`; YgW`]W`hY`XYg`BUhi fgW`i hnYg`]b`6Ua VYf[  
i bj Yf[ YggYb`V`Y]VYbž`k `A`fYbX`X]Y`GhUXh`g]W`k Y]hYf\]b`XYb  
<YfUi gZcfXYfi b[ Yb`ghY`hž`X]Y`X]Y`Ni \_i bZh`Vf]b[ h"

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