

@UbX`ghÄf`_h`=b[Yb]Yi fUi gV]`Xi b[

8]Y`@UbXYgfY[]Yfi b[`ghÄf`_h`X]Y`=b[Yb]Yi fUi gV]`Xi b[`]a
@UbXž`i a `6UXYb!K ØfhhYa VYf[`Ui W`ni _ØbZh][`U`g
=bcj Uh]cbgghUbXcfh`ni `d cg]h]cb]YfYb"8 Uni `[Y\ Òfh`Ygž`XUg
Ghi X]YbUb[YVch`XYf`=b[Yb]Yi fk]ggYbgW UZhYb`UhhfU_h]j `i bX
U_hi Y``ni `U`hYb" 9g`k Uf``Äb[gh`ØVYfZÄ``][ž`XUgg`X]Y
= b[Yb]Yi fUi gV]`Xi b[`]b`XYb` : c_i g`[YfØW`h`k]fX ž`gU[hY`X]Y
K]ggYbgW UZhga]b]ghYf]b`HYfYgU`6Ui Yf`Ub`Ägg`]W`Y]bYf
DfÄgYbhUh]cb`j cb`U_UXYa]gW`Yb`i bX`[YgW`ÄZi`]W`Yb
C f[Ub]gUh]cbYb`Dcg]h]cbgdUd]Yf`ni f`GhÄf`_i b[`XYf
= b[Yb]Yi fUi gV]`Xi b[`]b`6UXYb!K ØfhhYa VYf[`fD8: £" K]f
Yf`YVYb`b]W`h`bi f`Y]bY`_i fnZf]gh][Y`k]fhgW UZh`]W`Y`K Y`Y
cXYf`5i gk]f`_i b[Yb`XYf`7cj]X`DUbXYa]Yž`gcbXYfb`Y]bY
k Y]hfY]W`YbXY`i bX`bUW`U`h][Y`HfUbgZcfa Uh]cb`i bgYfYf
K]fhgW UZh`8]Yg`YfZcfXYfh`Ui W`ghfi _hi fY``Y`J YfÄbXYfi b[Yb
]b`XYb`=b[Yb]Yi fk]ggYbgW UZhYbž`\fYb`Ghi X]Yb]b`U`hYb`i bX
: cfgW`i b[ggW`k Yfdi b`_hYb"8 U\Yf`VY[fØ»Y`]W`Yg`gY`fž
XUgg`X]YgYg`/ Ua d^Y``d/

8]Y`@UbXYgfY[]Yfi b[`ghÄf`_h`X]Y`=b[Yb]Yi fUi gV]`Xi b[`]a
@UbXž`i a `6UXYb!K ØfhhYa VYf[`Ui W`ni _ØbZh][`U`g
=bcj Uh]cbgghUbXcfh`ni `d cg]h]cb]YfYb"8 Uni `[Y\ Òfh`Ygž`XUg
XUg`Ghi X]YbUb[YVch`XYf`=b[Yb]Yi fk]ggYbgW UZhYb
UhhfU_h]j `i bX`U_hi Y``ni `U`hYb"

9g`k Uf``Äb[gh`ØVYfZÄ``][ž`XUgg`X]Y`=b[Yb]Yi fUi gV]`Xi b[`]b`XYb
: c_i g`[YfØW`h`k]fX ž`gU[hY`X]Y`K]ggYbgW UZhga]b]ghYf]b`HYfYgU
6Ui Yf`Ub`Ägg`]W`Y]bYf`DfÄgYbhUh]cb`j cb`U_UXYa]gW`Yb`i bX
[YgW`ÄZi`]W`Yb`C f[Ub]gUh]cbYb`Dcg]h]cbgdUd]Yf`ni f`GhÄf`_i b[
XYf`=b[Yb]Yi fUi gV]`Xi b[`]b`6UXYb!K ØfhhYa VYf[`fD8: £"

K]f`Yf`YVYb`b]W`h`bi f`Y]bY`_i fnZf]gh][Y`k]fhgW UZh`]W`Y`K Y`Y

cXYf'5i gk]f_i b[Yb'XYf'7cj]X'DUbXYa]Yž'gcbXYfb'Y]bY
k Y]hfY]WXYbXY'i bX'bUW\U'h][Y'HfUbgZcfa Uh]cb'i bgYfYf
K]fhgW\UZh"8]Yg'YfZcfXYfh'Ui W\ghfi _hi fY''Y'J YfAbXYfi b[Yb']b
XYb'⊕[Yb]Yi fk]ggYbgW\UZhYbž']\fYb'Ghi X]Yb]b\U'hYb'i bX
: cfgW\i b[ggW\k Yfdi b_hYb"8U\Yf'VY[fØ»Y']W\Yg'gY\ž'XUgg
X]YgYg'H\Ya U'gmghYa Uh]gW\Ub[Y[Ub[Yb'k]fX"Bi f'a]h'Y]bYf
[Ya Y]bgUa Yb'5bgfhYb[i b['j cb'K]fhgW\UZhž'<cW\gW\i 'Yb'i bX
Dc`h]_ _ÖbbYb'k]f'XYb'⊕bcj Uh]cbggUbxcfh'6UXYb!K ØfhYa VYf[
[i h'Ui Z'X]Y'<YfUi gZcfXYfi b[Yb'XYf'Ni _i bZh'j cfVYfY]hYb ž
VYhcbhY'X]Y'A]b]ghYf]b"

Ghi X]Yb_UdUn]hÅh'Ui ZfYW\h'Yf\U'hYb

8 Ug'@UbX'ghfYVh'_Y]bYb'5VVUi 'j cb'Ghi X]Ybd'ÅhYb'Ub' 'ja
; Y[YbhY]' K]f'VfUi WXYb'† b[Y'⊕[Yb]Yi f]bbYb'i bX'⊕[Yb]Yi fYž
]\fY'fYUh]j]hÅh'i bX']\f'9b[U[Ya Ybh"8Yg\U'V'\Uh'g]W\XUg'@UbX
a]h'XYb'<cW\gW\i 'Yb'Ui W\]b'XYf
<cW\gW\i 'Z]bUbn]Yfi b[gj YfY]bVUfi b['&\$&%V]g'&\$&) 'XUfUi Z
j YfghÅbX][hž'U''Y'Ghi X]Yb_UdUn]hÅhYb'i bX']bgVYgcbXYfY'X]Y']b
XYb'⊕[Yb]Yi fk]ggYbgW\UZhYb'Ui ZfYW\hni Yf\U'hYb"8Uni '[Y\Øfhž
XUg'Ghi X]YbUb[YVch'UhhfU_h]j 'i bX'_U_hi Y''ni '\U'hYbž'XUa]h'Yg
bUW\ [YZfU[h'i bX'VY'Y[h'k]fX ž'gc'A]b]ghYf]b'H\YfYg]U'6Ui Yf
k Y]hYf"

8 Ug'K]ggYbgW\UZhga]b]ghYf]i a 'i bhYfghØhnh'X]Y'<cW\gW\i 'Yb'i bX
]\fY']b[Yb]Yi fk]ggYbgW\UZh]WXYb': U_i 'hÅhYb'XUVY]ž']\f
Ghi X]YbUb[YVch'bcW\ _cbgYei YbhYf']b'F]W\hi b['8][]hU'g]Yfi b[
i bX'8Y_UfVcb]g]Yfi b['Ui gni f]W\hYbž'XUa]h'X]Y'5Vgc'j Ybh]bbYb
i bX'5Vgc'j YbhYb'Z]h'ZØf'X]Y'æVg'XYf'Ni _i bZh'g]bX"?'ØbZh]['k YfXYb
a Y\f'GcZhk UfY!⊕[Yb]Yi fY'i bX'GdYn]U'ghYb'ZØf'a UgW\]bY''Yg
@YfbYb'VYbØh][hž'a Y\f'9l dYfh]gY']b'9'Y_hfca cV']hÅh'i bX
6UhYf]YgdY]WXYfb'i bX'k Yb][Yf']b'J YfVfYbbi b[ga chcfYb'i bX
UbU`c[Ya 'A UgW\]bYbVUi "

HU`YbhY'Ub'X]Y'I b]j Yfg]hÅhYb'XYg'@UbXYg
\c`Yb

8 Ug`K]ggYbgW\UZhga]b]ghYf]i a`]gh`VYfY]hg`]b` ; YgdfÅWYb`a]h
<cW\gW\i`Yb`i bX`XYf`ϕXi ghf]Y` i bhYf`UbXYfYa`]gh`Yg`]a
F U\ a Yb`XYf`[Yd`Ubh`GhfUhY []gW\Yf`8]U`c [`a]h`XYf
5i hca cV`]bXi ghf]Y`]b`6UXYb!K ØfhYa VYf [`A U]`Y]bYb
[Ya Y]bgUa Yb`K cf_g\cd`ni a` H\Ya U` J YfÅbXYfhYf
: UW_fÅZhYVYXUfZ ži a` [Ya Y]bgUa`X]Y
]b [Yb]Yi fk]ggYbgW\UZh`W\Y`5i g!`i bX`K Y]hYfV]`Xi b [`Ub`XYf
GW\b]hhghY`Y`nk]gW\Yb`K]fhgW\UZhž`<cW\gW\i`Yb`i bX`A]b]ghYf]i a
ni`VYhfUW\hYb`"

A]h`ni _i bZhgzÅ\] [Yb`Ghi X]Yb [Åb [Yb`k]fX`Yg`XYb`VUXYb!
k ØfhYa VYf []gW\Yb`<cW\gW\i`Yb` [Y`]b [Ybž`g]W\`ja`Vi bXYgk Y]hYb
K YhhVYk YfV`a]h`UbXYfYb`<cW\gW\i`ghUbXcfhYb`ni`VY\Ui dhYb`"Gc
n]Y\Yb`k]f`HU`YbhY`Ub`i bgYfY`<cW\gW\i`Yb`i bX` [Yk]bbYb`g]Y`ZØf
X]Y`VUXYb!k ØfhYa VYf []gW\Yb`i bhYfbY\ a Yb` `XYf`A]b]ghYf`Ui g
, VYfnYi [i b ["

9]b`]bhYbg]j Yf`5i ghUi gW\`nk]gW\Yb
K]fhgW\UZhž`6Yfi ZggW\i`Yb`i bX`<cW\gW\i`Yb
]gh`i bYf`Ågg`]W\

Ni a` [Ya Y]bgUa Yb`Dcg]h]cbgdUd]Yf` GhÅf_i b [`XYf
ϕ [Yb]Yi fUi gV]`Xi b [`]b`6UXYb!K ØfhYa VYf [`XYf
@UbXYgfY`_hcYb`_cbZYfYbn`6UXYb!K ØfhYa VYf [ž`XYf`<cW\gW\i`Y
6UXYb!K ØfhYa VYf [ž`XYf`8i U`Yb`<cW\gW\i`Y`6UXYb!
K ØfhYa VYf [ž`XYg`5fVY]h [YVYfj YfVUbXYg`GØXk Ygha YhU`ž`XYg
J 8 =6UXYb!K ØfhYa VYf []gW\Yf`@UbXYgj YfVUbXž`XYf`J 8 A 5
6UXYb!K ØfhYa VYf [`K ØfhYa VYf [`i bX`X]Y`ϕ [Yb]Yi f_Ua a Yf
6UXYb!K ØfhYa VYf [ž`gU [hY`XYf`K]fhgW\UZhg!`i bX`5fVY]hga]b]ghYf`
8f`"B]Wc`Y`<cZZa Y]ghYf!`? fUi h.

HYW\b]gW\Y`6Yfi ZgZY`XYf`i bX`ϕ [Yb]Yi fghi X]Yb [Åb [Y`g]bX`ZØf
_Ui a` Y]b`UbXYfYg`6i bXYg`UbX`gc`k]W\h] [`k]Y`ZØf`6UXYb!
K ØfhYa VYf ["`8Ybb`]a`@UbX`XYf`HØZh`Yf`i bX`8Yb`_Yf`g]bX` [YfUXY
X]Y`ghUf`_Ybž`hYW\b]gW\`cf]Ybh]YfhYb`@Y]h]bXi ghf]Yb`hfUX]h]cbY`
k]W\h] [Y`GhØhnYb`ZØf`K c`\ghUbX`i bX`6YgW\ÅZh] [i b [`]a`@UbX`"i a
i bgYfY`ϕbcj Uh]cbg_fUZh`ni`ZYgh] [Ybž`]gh`Yg`k]W\h] [ž`XUgg`X]Y

Ghi X]Yb[Åb[Y`Ui ZXYf`<Ö\Y`XYf`NY]h'g]bX`i bX`k]W\h][Y`H\Ya Yb
k]Y`i hi fY`G_]`gž`? =i bX`B UW\U`h][_Y]h'ZfØ\N]h][`Ui Z[fY]ZYb ž'gc
X]Y`A]b]ghYf]b"8Ua]h'XUg`[Y`]b[hž`VYXUfZ`Yg`Y]bYg`]bhYbg]j Yb
5i ghUi gW\g`nk]gW\Yb`K]fhgW\UZhž`6Yfi ZggW\i `Y`i bX`i b]j Yfg]hÅh`]gh
i bUVX]b[VUf"5i »YfXYa `U`hY`]W`Y]bY`[i hY`ZUW`]W`Y`i bX
dYfgØb`]W`Y`6YhfYi i b[`XYf`Ghi X]YfYbXYb`j cb`5bZUb[`Ub`i bX
k Å\fybX`XYg`[YgUa hYb`Ghi X]i a`g`ZØf`i bVYX]b[h`YfZcfXYf`]W`ž`XU
k]f`gc bgh]b`gW\k]Yf][Yb`D\UgYb`]bhYfYgg]YfhY`Ghi X]YfYbXY`Ui Z
XYa`K Y[`j`Yf`]YfYb"

5VYf`a Ub`a i gg`Ui W`ZfØ\Yf`UbZUb[Yb.`8]Y`[fc»Y
<YfUi gZcfXYfi b[`XYf`fØW`_`Åi Z][Yb`6Yk YfVYfnU\`Yb`ZØf`X]Y
⇒[Yb]Yi fk]ggYbgW\UZhYb`VYghY`h`XUf]bž`↑ b[Y`A YbgW\Yb`]b`XYf
6Yfi Zgcf]Ybh]Yfi b[gd\UgY`bUW\U`h][`ZØf`hYW\b]gW\Y`H\Ya Yb`ni
VY[Y]ghYfb"8Yg\U`V`i bhYfghØhnY`]W`U`Y`5_h]j]hÅhYb`XYf
K]fhgW\UZhž`i a`↑ b[Yb`A YbgW\Yb`a]h`6Yhf]YVgVYg]W\h][i b[Yb
i bX`DfU_h]_U`X]Y`j]Y`ZÅ`h][Yb`A Ø[`]W`_Y]hYb`gck c\`]a
⇒[Yb]Yi fk YgYb`U`g`Ui W`]a`<UbXk Yf`_`bÅ\Yf`ni `Vf]b[Yb"9]bY
hYW\b]gW\Y`5i gV`]Xi b[`_Ubb`ØVf][Ybg`Ui W`Y]bY`\Yfj`c ffU[YbXY
6Ug]g`ZØf`Y]b`⇒[Yb]Yi fghi X]i a`gY]b ž`VYhc`bhY`Yf`<c`Za`Y]ghYf!
?fUi h"

⇒gd]f]Yfh]j cb`@UbXYgfY[]Yfi b[`6K

8YhU]`g

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