

# A i h][ Yf'Dc`]n]gh'ghY``h'@UXYbX]YV']b 9]gZY`X' '5`\_c\c`hYgh'U`g'K YbXYdi b\_h

9]b 'Dc`]n]gh']a '8]YbghZfY]'ghcddh'Y]bYb'@UXYbX]YV']b'9]gZY`X" 5hYa U`\_c\c`hYgh'nY][ h'%ž&&'Dfca ]``Y"': U\_hYb'i bX <]bhYf[fØbXY'\]Yf°

#### 7cVif['fchgk

#D 'Y]bYf'ØVYffUgW\YbXYb'K YbXi b['XYf'9fY][b]ggY'\_Ua 'Yg'Ua A cbhU[UVYbX'ni 'Y]bYa 'J cfZU``ž'XYf'nY][hž'XUgg'< Y`XYbhi a 'Ui W\i bUi Z[YZcfXYfh'i bX']a '5``hU['[YgW\Y\Yb'\_Ubb"'9]b'(&!^\A\f][Yf A Ubb''VY[UV'g]W\'k \A\fYbX'XYg'9]b\_Ui Zg']b'Y]bYa @YVYbga ]hhY`[YgW\\AZh']b'XYf'7cVi f[Yf'GhfU\'yY']b'9]gZY'X'XUni ž Y]bY'GW\UW\hY``N][UfYhhYb'ni 'ghY\`Yb"'5bghUhh'X]YgYb']``Y[U`Yb D`Ub'i b[Y\]bXYfh'Xi fW\ni n]Y\Ybž'k i fXY'Yf'YXcW\'j cb'Y]bYa ni Z\A``]['Ubk YgYbXYb'Dc`]n]ghYb'VYa Yf\_hž'XYf'ni 'X]YgYa NY]hdi b\_h'b]W\h']a '8]Ybgh'k Uf"

 $8 \ Yf'Dc`]n]gh'VYa \ Yf\_hYž'k \ ]Y'XYf'8 \ ]YV'X]Y'N][ \ UfYhhYb']b'gY]bYf < cgYbhUgWXY'j \ YfghUi \ hY'i \ bX'g]WX'UbgWX \ ]W_hYž'XYb'@UXYb'ni j Yf`UggYbž'c\bY'ni 'VYnU\`Yb'''9g'VfUi WX'hY'bi f'Y]bYb'_i fnYb A ca Ybhž'V]g'XYf'6YUa hY'U_h]j'k i fXY'i bX'XYa 'A Ubb'Zc`[ hY''' \DX'Yf'\Yi h][ Yb'NY]h']gh'gc`WX'Y]b'9]b[ fY]ZYb'b]WX h'U``hÀ[`]WXž VYgcbXYfg'k Ybb'a Ub'VYXYb_hž'XUgg'XYf'Dc`]n]gh'b]WX h']b'I b]Zcfa k Uf''$ 

## 8YfJcfZU``]a 8YhU]`

5`g`XYf`(&!À\f][Y`j Yfgi W\hY`ni 'Z]Y\Ybž`\_Ua 'Yg`ni 'Y]bYa 'U\_h]j Yb <UbX[Ya Yb[Y"'Hfchn'XYf`6Ya Ø\i b[Yb`XYg`Dc`]n]ghYbž'XYb`A Ubb ZYghni \U`hYbž'[Y`Ub['Yg`XYa '8]YV'ni bÀW\ghž'g]W\``cgni fY]» Yb"

8 c W 'XYf'9]bgUhn'XYg'Dc`]n]ghYb'V`]YV'b]W h'c\bY'9fZc`[/gW\`]Y»`]W '\_cbbhY'Yf'XYb'8]YV'UVZUb[Yb'i bX'g]W YfghY``Ybž'XUggX]YgYf'b]W h'bcW 'Y]ba U`'Ybhk]gW hYž'V]g'X]Y'i b]Zcfa]YfhYb?c``Y[Yb'Y]bhfUZYbžia'X]Y'G]hi Uh]cb'ni 'ØVYfbY\aYb"

K À\fYbX'XYf'k Y]hYfYb'A U» bU\a Yb'ghY``hY'g]W\'\YfUi gž'XUgg'XYf i bgYfY'5i Za Yf\_gUa \_Y]h'YffY[YbXY'A Ubb'i bhYf'XYa '9]bZi gg'j cb 5`\_c\c`'ghUbX"'9]b'5hYa U`\_c\c`hYgh'Yf[UV'Y]bYb'K Yfh'j cb'%ž&& Dfca ]``Yž'k Ug'X]Y'G]hi Uh]cb'cZZYbg]W\h`]W\'\_ca d`]n]YfhY"'8]Y?ca V]bUh]cb'Ui g'5`\_c\c`'i bX'\_f]a ]bY``Yf'9bYf[]Y'\_Ubb'XUni ZØ\fYbž'XUgg'gc`W\Y'JcfZÀ``Y'b]W\h'bi f'[YZÀ\f`]W\ž'gcbXYfb'Ui W\i bVYfYW\YbVUf'k YfXYb"'@Yhnh`]W\'k i fXY'XYf'@UXYbX]YVUb[YnY][h'i bX'Yfk UfhYh'bi b'X]Y'?cbgYei YbnYb'gY]bYg'<UbXY`bg"

#### FY`Yj Ubn'XYf'HUh

8]Y'HUhgUW\Yž'XUgg'Y]b'n]j ]'Yf'Dc`]n]gh'Y]bYb'8]YV'Ui »Yf\U'V
gY]bYf'[Ykc\bhYb'8]YbghnY]h'ghY``Yb'\_cbbhYž'k]fZh:fU[Yb'Ui Z''=b
Y]bYf'; YgY``gW\UZhž']b'XYf'G]W\Yf\Y]hg\_fÀZhY'ni bY\a YbX'i bhYf
8fi W\_'ghY\Ybž']gh'Yg'Yfa i h][YbX'ni 'gY\Ybž'XUgg'Yg'A YbgW\Yb
[]Vhž'X]Y'VYfY]h'g]bXž'b]W\h'bi f'U`g'6Øf[Yfž'gcbXYfb'Ui W\'U`g'<ØhYf
XYf'CfXbi b['ni '\UbXY`b'''Gc`W\'Y]b'9]b[fY]ZYb'\_ObbhY
a O[`]W\YfkY]gY'UbXYfY'XUni 'Yfa i h][Ybž'Gh\XhYb'XYf
, VYfk UW\i b['i bX'?f]a ]bU`]h\h'a Y\f'6YUW\hi b['ni 'gW\Yb\_Yb''
8]Yg'\_ObbhY'XUni 'ZØ\fYbž'XUgg'6Øf[Yf'g]W\'kYb][Yf'Ubcbma
ZØ\`Yb'i bX'VYfY]hk]``][Yf']b'X]Y'Y][YbYb'<\AbXY'bY\a Ybž'k Ug
UbXYfY'hi b'cXYf'`UggYb''

8 UfØVYf`\]bUi g`VYghY\h`Y]b`[Yk]ggYg`AU» `Ub`<c\Zzbi b[\z`XUgg`X]Y\
5\_h]cb`XYg`Dc`]n]ghYb`XUni `VY]hfÀ[hz`XUgg`X]Y`6Yj\O`\_Yfi b[`Y]b
[fO`) YfYg`6Yk i gghgY]b`ZØf`8]YVghÀ\`Y`]b`@ÀXYb`Ybhk]W\_Y`h"
; Yk\O\b`]W\`gY\Yb`X]Y`AYbgW\Yb`c\Zh`kY[\z`kYbb`g]Y`Y]b
J\YfVfYW\Yb`VYc\VUW\hYbz`j]Y``Y]W\h`Ui g`5b[gh`c\XYf`I bg]W\Yf\Y]hz
k\Ug`ni `hi b`]gh"`8\Yf`Jcf\ZU```]b`9]g\ZY`X`\_ObbhY`gca]h`U`g`5bgdcfb`\ZØf\Ub\XYfY`X]YbYbz`g]W\`U\_h]j`Y]bni Vf]b[\Ybz`k\Ybb`g]Y`NYi [\Yb`Y]bYg
J\YfV\fYW\Ybg`k\YfXYbz`UbghUhh`g]W\`d\Ugg]j`ni `j\Yf\U`hYb"

 $9]b`kY]hYfYf`5gdY\_hž`XYf`b]W\h`ØVYfgY\Yb`kYfXYb`gc``hYž`]gh`XYf$ 

9]bZi ggʻj cbʻ5`\_c\c``Ui ZʻXUgʻJ Yf\U`hYbʻj cbʻA YbgW\Ybʻi bXʻX]Y
9bhgW\Y]Xi b[ž']bʻX]Yʻ\_f]a ]bY``Yʻ6U\bʻni ʻfi hgW\Yb"'8Yfʻ(&!À\f][Y
]ghʻY]bʻ6Y]gd]Y``XUZØfžʻk ]YʻY]bYʻi bØVYf`Y[hYʻ9bhgW\Y]Xi b[ž
VY[`Y]hYhʻj cbʻY]bYa ʻYf\Ò\hYbʻ6`i hU`\_c\c`gd]Y[Y`žʻni
?cbgYei YbnYbʻZØ\fYbʻ\_UbbžʻX]YʻXUgʻ@YVYbʻY]bYfʻDYfgcb
bUW\\U`h][ʻj YfÀbXYfb"

### FYU\_h]cbYb'Ui g'XYf'2 ZZYbh`]WX\_Y]h

8]Y'A Y`Xi b['ØVYf'XYb'Nk]gW\YbZU```]b'9]gZY`X'\Uh']b'XYf

2 ZZYbh`]W\\_Y]h'j YfgW\]YXYbY'FYU\_h]cbYb'Ui g[Y`Ògh"'J]Y`Y'6Øf[Yf
VY[fØ» Yb'XUg'9]b[fY]ZYb'XYg'Dc`]n]ghYb']a '8]YbghZfY]'i bX'gY\Yb
Yg'U`g'NY]W\Yb'ZØf'Y]b'Yf\Ò\hYg'G]W\Yf\Y]hgVYk i gghgY]b']b'XYf
; YgY``gW\UZh"'NU\`fY]W\Y'GcW]U`!A YX]U!Bi hnYf'\YVYb'\Yfj cfž'XUgg
6Øf[Yf'X]Y'JYfUbhk cfhi b['ØVYfbY\a Yb'gc``hYbž'k Ybb'Yg'i a 'X]Y
G]W\Yf\Y]h']b']\fYb'; Ya Y]bXYb'[Y\h"'

5``YfX]b[g'[]Vh'Yg'Ui W\'\_f]h]gW\Y'Gh]a a Ybž'X]Y'XUfUi Z'\]bk Y]gYbž XUgg'X]Y'6Øf[Yf'\_Y]bY'Dc`]nY]Ui Z[UVYb'ØVYfbY\a Yb'gc``hYbž'XU X]Yg'dchYbn]Y```[YZÀ\f`]W\Y'G]hi Uh]cbYb'\Yfj cffi ZYb'\_Ubb"'8Yf J cfZU```k]fZh'X]Y': fU[Y'Ui Zž'k]Y'j]Y``9][Ybj YfUbhk cfhi b['j cb'XYb 6Øf[Yfb'Yfk UfhYh'k YfXYb'\_Ubb'i bX']bk]Yk Y]h'X]Y'Dc`]nY]']b'XYf @U[Y']ghž']\fY'5i Z[UVYb'i bhYf'XYb'U\_hi Y``Yb FU\a YbVYX]b[i b[Yb'YZZY\_h]j'k U\fni bY\a Yb"

# FY`Yj UbhY GhUh]gh]\_Yb ni f'?f]a ]bU`]hÀh

 $= \frac{1}{100} + \frac$ 

Ni gÀhn`]W\`XUni `nY][Yb`l a ZfU[Ybž`XUgg`Y]b`Yf\YV`]W\Yf`HY]``XYf 6Yj Ò`\_Yfi b[ 'g]W\`ni bY\a YbX'i a ']\fY'G]W\Yf\Y]h'gcf[ h"`@Ui h Y]bYf'9f\YVi b[ 'XYg'DYk 'FYgYUfW\'7YbhYfg'Ui g'XYa '\$U\f'&\$&&  $[UVYb^*\emptyset VYf^**\$^*i - XYf^*6YZfU[hYb^*Ubž^*XUgg^*g]Y^*g]W^*]b^*] \land fYf \\ K c \land b [Y[YbX^*i bg]W^*Yf^*Z\emptyset \land Yb^*^8]Yg^*_Ubb^*X]Y^*6YfY]hgW^*UZh^*XYf \\ 6\emptyset f [Yf^*VYY]bhf^AW^*h][Ybž^*]b^*A \land b^*]W^*[Y^*U[YfhYb^*G]hi^*Uh]cbYb^*k^]Y^*]b^*]gZY^*X^*U_h]j^*ni^*k^*YfXYb^*$ 

#### 8]YFc``YXYfDc`]nY]]bXYf;YgY``gWXUZh

8]Y'Dc`]nY]'b]a a h'Y]bY'nYbhfU`Y'Fc``Y']a 'XYi hgWXYb

FYWXhggmghYa 'Y]b"'=\fY'<Ui dhUi Z[UVY']gh'Ygž'X]Y'ÒZZYbh`]WXY

CfXbi b['Ui ZfYWXhni Yf\U`hYb'i bX'GhfUZhUhYb'ni 'j Yf\]bXYfb"'=a

FU\a Yb'X]YgYf'JYfUbhk cfhi b['g]Y\h'g]WX'X]Y'Dc`]nY]'ni bY\a YbX

<YfUi gZcfXYfi b[Yb'[Y[YbØVYfž']bgVYgcbXYfY']b'6Yni ['Ui Z'X]Y

K U\fbY\a i b['j cb'G]WXYf\Y]h'Xi fWX'X]Y'6Yj Ò`\_Yfi b["

 $NU\ `fY]WXY'Ghi X]Yb'VY`Y[Ybž'XUgg'XUg'JYfhfUi Yb']b'X]Y'Dc`]nY]']b XYb'`YhnhYb'\J\fYb'[YgWXk Ub_h'\Uh'': U_hcfYb'k]Y'[YgWXY]hYfhY FYZcfa Ybž'6Yf]WXhY'\ØVYf'Dc`]nY][Yk U`h'i bX'X]Y'U``[Ya Y]bY JYfZ\[O[VUf_Y]h'j cb'\DZcfa Uh]cbYb'\ØVYf'GhfUZhUhYb'\UVYb'XUg \( \alpha \ U[Y'XYf'Dc`]nY]'VYY]bZi ggh''\\DY'Y]bYf'I a ZfU[Y'Ui g'XYa \\J\f &\$\%'[UVYb'bi f') \%'I \ XYf'6YZfU[hYb'Ubž'j c``Yg'JYfhfUi Yb']b'X]Y Dc`]nY]'ni \\UVYbž'k Ug'Y]bYb'F\@W_[Ub['[Y[Yb\@VYf'XYb'Jcf'U\fYb XUfghY``h''' \)$ 

8]Y '6YfY]hgW. UZh'j cb'6Øf[Yfbž']b'5i gbU\a Yg]hi Uh]cbYb'ni\UbXY`bž'\_Ubb'Ui W.'j cb']\fYa 'J YfhfUi Yb']b'X]Y 'Dc`]nY]
UV\Àb[Yb"'9]bY'ghÀf\_YfY'Ni gUa a YbUfVY]h'nk]gW.Yb'Dc`]nY]'i bX
6Yj Ò`\_Yfi b['\_\_ÒbbhY'XUni 'VY]hfU[Ybž'XUg'G]W.Yf\Y]hg[YZØ\`']b
XYb'; Ya Y]bXYb'ni 'ghÀf\_Yb"

8YhU]`g

6Ygi WXYb G]Y i bg Ui Z b!U[ "XY