

## 6Ygi WY ]b '7i gWcž'DYfi . '&%'; YVchY'i bX JYfVchY

DYfi g' \( \)\_U! \( \) k Y``VYk Y]gh\( \) XUgg XYf 'Hci f]ga i g'XYb'7\Ufa Y i bX'X]Y GYY'Y Y]bYf GhUXh'b]W h'nYfgh\( \) fy b' a i gg'' \( \) ]Yf ']gh\( \) k Ug'G]Y k ]ggYb'gc``hYb\( \) VYj cf'G]Y'7i gWc'VYgi W\( Yb'7i gWc']b DYfi ']ghY]bY'XYf'gW\( \) ObghYb\( \) gUi VYfghYb'i bX\( \) 'U\( \) VYgh\( \) bX][ ghYb'Gh\( \) XhY\( \) ']b XYbYb'k ]f'Y'k UfYb''8]Y \qquad a dcgUbhY'?c`cb]U`UfW\( \) hY\_hi f\( \) XJY'[Yhf]a a hYb FUgYb\( \) AW\( \) bi bX'X]Y'k Y]h'\( \) i f\( \) XJY'[Yhf]a a hYb FUgYb\( \) AW\( \) bi bX'X]Y'k Y]h'\( \) i j[Y'5i gg]W\( \) h'k ]f\_Yb']b a U\_Y``cgYf' \( \) Ufa cb]Y\( \) i a 'X]Y'gW\( \) AX`]W\( \) Yb'5i gk ]f\_i b[Yb XYg'Hci f]ga i g'ni 'bY[]YfYb''GY`VghX]Y'U``[Y[Ybk \) Afh][Yb [c`XYbYb'6\( \) [Yb'j cb' A W8cbU`X/ Ua d/\( \) , \( \) &\( \) +/g'g]bX i bUi ZZ\( \) `][ 'gW\( \) k Ufn'[YZ\( \) fVh'''4 ?]U5VXi ``U\'\\ \( \) WYf'7i gWc\( \) 8]YgY'GhUXh'a i gg'Y]bYb'GhmY[i]XY'\UVYb''5`Yg']gh'gc gh]a a ][''\( \) fY]gYba]hY]bYa YX]hcf'' '5h`Ug'/ Ua d/Ua d/'6cchg fH\( \) Uh`UgUbXVcchg\( \) '''5df]''\( \) \$\( \) U`h'1/Ua d/\( \) , \( \) &\( \) \$\( \) Yo'']d/

DYfi gʻ=b\_U! ¾ k Y``VYk Y]ghž'XUggʻXYfʻHci f]ga i gʻXYbʻ7\Ufa Yʻi bX X]YʻGYY`YʻY]bYfʻGhUXhʻb]W\hʻnYfghÒfYbʻa i gg"′<]Yfʻ]ghžʻk UgʻG]Y k ]ggYbʻgc``hYbž'VYj cfʻG]Yʻ7i gWcʻVYgi W\Yb

7 i gWc']b'DYfi ']gh'Y]bY'XYf'gW\ÒbghYbž'gUi VYfghYb'i bXž'\Už VYghÀbX][ghYb'GhÀXhYž']b'XYbYb'k]f'\Y'k UfYb"

8]Y`]a dcgUbhY`?c`cb]U`UfW\]hY\_hi fž`X]Y`[Yhf]a a hYb`F UgYbZÀW\Yb i bX`X]Y`k Y]h`Ài Z][Y`5i gg]W\h`k ]f\_Yb`]b`a U\_Y``cgYf`< Ufa cb]Yž`i a X]Y`gW\ÀX`]W\Yb`5i gk ]f\_i b[Yb`XYg`Hci f]ga i g`ni `bY[]YfYb" GY`Vgh`X]Y`U``[Y[Ybk Àfh][Yb`[c`XYbYb`6Ò[Yb'j cb`A W8cbU`X g g]bX`i bUi ZZÀ``][`gW\k Ufn`[YZÀfVh"

 $\UVYb"5``Yg']gh'gc'gh]a a ]["', fY]gYba ]hY]bYa YX]hcf$ 

"5h`Ug'/ "6cchg'f4 Uh`UgUbXVcchgŁ" ""5df]" &\$%)

"U`h1 6YgiW\"]b"7igWc 25h`Ug"/ '6cchg

BUhØf`]WX []Vh'Yg'hci f]gh]gWX Yb'GWX a i W\_ž'XYf'Y]b'cXYf'nk Y]
GhfU» Yb'gÀi a hž'UVYf'XUg'[YgWX]Y\h'Ui Z'gc'[YcfXbYhYž
cf[Ub]g]YfhY'K Y]gYž'XUgg'Yg'\_Ui a 'Ui ZZÀ``h'''?i fn'[YgU[hž'X]Y'GhUXh
VYk Y]ghž'XUgg'XYf'Hci f]ga i g'XYb'7\Ufa Y'i bX'X]Y'GYY`Y'Y]bYf
GhUXh'b]WXh'nYfghÒfYb'a i gg''K]f'\UVYb'Y]b'dUUf'HU[Y'Xcfh
j YfVfUWXh'i bX'X]Y'Zc`[YbXY'@]ghY'a ]h'H]ddg'ZØf'Y]bYb'6Ygi WX']b
7i gWc'ni gUa a Yb[YghY``h''

## &%; YVchYibXJYfVchY

- %" K Ybb'G]Y'bUWX'A UWXi 'D]WWXi 'k UbXYfbž'Z]Y[Yb'G]Y'b]WXh
  Ua 'HU['j cf'≜fYf'5VfY]gY'Y]b"'G]Y'VfUi WXYb'NY]hži a 'g]WX
  ni 'U\_\_\_`]a Uh]g]YfYbž'U`gc'j YfVf]b[Yb'G]Y'ni Yfgh'&!' 'HU[Y']b
  XYf'GhUXh"'9]b'A ÀXWXYb'Ui Z'i bgYfYf'K UbXYfi b['a UWXhY
  X]YgYb': Y\`Yf'i bX'\_Àa dZhY'X]Y'[UbnYb'ZØbZ'HU[Y"
- &" BY\a Yb`G]Y`Yg``Ub[gUa "`7i gWc`]ghij c``ghÀbX][`VY[Y\VUfž
  `]Y[h`UVYf`Ui W\'' "' - `A YhYf`f%%"%) %: i » Ł'ØVYf`XYa
  A YYfYggd]Y[Y`ž`U`gc``UggYb`G]Y`Yg`Ub`=\fYa `YfghYb`HU[
  Xcfh`fi \][`Ub[Y\Yb"
- '"?Ui ZYb`G]Y`⇒fY`Ci hXccf!5i gfØghi b[`b]W\h`]b`XYf`GhUXh"
  K Ybb`G]Y`ni 'Y]bYf`K UbXYfi b[`Ui ZVfYW\Ybž`\_Ui ZYb`G]Y
  ⇒fY`[YgUa hY`5i gfØghi b[`]a `JcfUi g"; YZÀ`gW\hY`9h]\_YhhYb
  g]bX`k Y]h'j YfVfY]hYh'i bX`XUg`YW\hY`5b[YVch`\_cghYh
  bcfa U`Yfk Y]gY`a Y\f`U`g`XYb`Ya dZc\`YbYb`JYf\_Ui ZgdfY]g"
- ("6Ygi WXYb'G]Y'X]Y'i a `]Y[YbXYb'Fi]bYb"'K Ybb'G]Y'NY]h \UVYbž'k UbXYfb'G]Y'ni 'XYb'Fi]bYb'j cb'GUWgU\i Ua Ub i bX'EYb\_c'Ui Z'XYa '<Ø[Y`'cVYf\U`V'j cb'7i gWcži a 'Y]bYb [fc»Ufh][Yb'6`]W\_'ØVYf'X]Y'GhUXh'ni '[Yb]Y»Yb"
- ) " ? Ui ZY b 'G]Y 'Y]b Y b '6 c `Y hc 'Hi f]gh]Wc ž'k Y b b 'G]Y 'X]Y 'a Y]ghY b GY\Ybgk ØfX][ \_Y]hY b ']b '7 i gWc 'i b X ']a '< Y]`][ Y b 'HU`

VYgi WYb'a  $\grave{O}$ W hYb"'9g'\_cghYh'%)) 'D9B'f(+'I G8Ł'i bX [Yk  $\grave{A}$ \fh'Ni [Ub['ni'%\*'5hhfU\_h]cbYb'ØVYf'Y]bYb'NY]hfUi a j cb'%\$'HU[Yb"'?Ui ZYb'G]Y'Yg']b' $\mathrel{\Rightarrow}$ fYa '<cghY`'cXYf'Ub'XYf Hci f]ghYb]bZcfa Uh]cb']b'XYf'5j Yb]XU'9`'Gc`'%\$' "

## 'U'h1 6Ygi W\']b'7igWc 25h'Ug'/ '6cchg

- %" DfcV]YfYb'G]Y'XUg'`c\_U`Y'9ggYb"'CV'A YYfgWkkY]bWkYb
  ff7i mŁź5`dU\_U'cXYf'Y]b'kYb][Yf'UVYbhYi Yf`]WkYg'@ca c
  GU`hUXc'fGhYU\_'a ]h'kØfn][Yf'DUdf]\_U'i bX'Nk]YVY`b
  gUi h]YfhŁź7i gWc'\Uh'Y]b][Y'\_Ògh`]WkY'FYghUi fUbhg'ni
  V]YhYb"'DfcV]YfYb'G]Y'7]WW]c`]bU'cXYf'XUg'FYghUi fUbh
  \\_D\_Uni Y`U"'KYbb'G]Y'XUg'6i X[Yh'\UVYbž'gc``'9`'Hi dUm']a
  [fc»nØ[][Yb'<chY`'AcbUghYf]c'Ui g[YnY]WkbYh'gY]b"</pre>
- &" = bcf]YfYb^G]Y^b]WkhXUg^]bhYfbUh]cbU`Y^9ggYb"^8]Y^: U`UZY` ]a `DU`ca U^=a V]g^g]bX^Y]bZUWk^\_Ogh`]Wk"^6YghY``Yb^G]Y^Y]bY Dcfh]cb^a ]h`XYf^k Øfn][Yb^GUi Wk^i bX^k U[Yb^G]Y^Ygž^U``Yg Ui Zni YggYb"
- ' " , VYfbUWkhYb'G]Y']b'Y]bYa 'Ofh']WkYb'<cgdYXU'Y"'8]YgY
  k YfXYb']b'XYf'FY[Y`'j cb'9]b\Y]a ]gWkYb'VYhf]YVYb'i bX
  V]YhYb'\_ca ZcfhUV`Y'I bhYf\_ØbZhY'ni '\Yfj cffU[YbXYb
  DfY]gYb"'K ]f'ØVYfbUWkhYhYb']a '<cghU``Bi Yj U'5`hU"
  5VYbXg'k i fXY'Yg'Yhk Ug'\_Ø\`ž'UVYf'X]Y'bYhhY': Ua ]`]Y
  a UWkhY'XUg'a Y\f'U`g'k Yhh"</pre>
- ("6YcVUW\hYb'G]Y'X]Y'@Yi hY'Ui Z'XYf'D`UnU'XY'5fa Ug"'9g'\Uh Yhk Ug'ni h]YZgh'9bhgdUbbYbXYgž']b'XYf'BUW\a]hhU[ggcbbY ni 'g]hnYb'i bX'ZUi `'Hci f]ghYb'i bX'DYfi UbYf'ni VYcVUW\hYbž'X]Y'g]W\'Ub'XYf'7UhYXfU`'XY`'7i nWc'hi a a Y`b"
- ) " < U`hYb`G]Y`Ubži a `GhUfVi W\_g`i bX`A W8cbU`X g`ni [Yb]Y» Yb" =a `; Y[YbgUhn`ni `U``Yb`UbXYfYb`:]`]U`Ybž'X]Y`k]f [YgY\Yb`\UVYbž']gh'7i gWcg'a]h'gWk UfnYb`@c[cg'i bX6UW\_ghY]bZUggUXYb`[YgWka ØW\_hži a `g]Wk`]b`X]Y`Ÿgh\Yh]\_XYf`GhUXh`Y]bni ZØ[Yb"'9]bY`@Y\fY`j]Y``Y]Wkh`ZØf`]\fYi bnÀ\`][Yb`UbXYfYb`6fUbWkYb3
- \*" A UWX Yb 'G]Y '\_Y]bY': chcg'j cb 'A YbgWX Ybž'c\bY 'ni 'ZfU[ Yb" 8]Yg'gc``hY 'ØVYfU```GhUbXUfX 'gY]bž'UVYf'X]Y '9]b\Y]a ]gWX Yb j cb '7 i gWc 'fYU[ ]YfYb 'VYgcbXYfg'gYbg]VY` 'XUfUi Z" 'GY] \OZ]WX "

- %": Y]`gW\Yb"`K ]Y`]b`j ]Y`Yb`UbXYfYb`Hcif]ghYbghÀXhYb k YfXYb`X]Y`DfY]gY`Yf\Ò\hž`U`gc`gW\YiYb`G]Y`g]W\`b]W\hž bUW\`Y]bYa``FUVUhh`ni``ZfU[Yb"`8Yb\_Yb`G]Y`bUhØf`]W\ XUfUbž`XUgg`DYfi``fY`Uh]j``Ufa``]ghž`U`gc`V]YhYb`G]Y`Ubž`k Ug G]Y`ZØf`ZU]f`\U`hYbž`UVYf`b]W\h'k Yb][Yf"
- &" ? Ui ZYb `G]Y `\_Y]bY `5`dU\_Uk c``Y" 6UVm!5`dU\_U3`9\Yf j ]Y``Y]W\h'5`dU\_U° ž'gW\YfnYb `X]Y ; i ]XYg`]b `7 i gWc `[ YfbY" ? Ui ZYb `G]Y `\_Y]bY `V]``][ Yb `Ghf]W\_k UfYbž'XU `X]YgY k U\fgW\Y]b`]W\ `[ YZÀ`gW\h'g]bX"
- ' " 9fk UfhYb 'G]Y 'F Y[ Ybž'XYf'j cb '8 YnYa VYf'V]g'A Àfn 'ØV`]WX ]gh" '5df]` 'V]g 'B cj Ya VYf'V]YhYh 'VYggYfYg'K YhhYfž'UVYf dUW\_Yb 'G]Y 'GWX ]WX hYb 'Y]bž'XU'[ fc » Y '< Ò\Yb '\_Ø\ `Y '5VYbXY VYXYi hYb"
- (" @YfbYb'G]Y'Yhk Ug'ØVYf'X]Y'; YgW\]W\hY'XYf'GhUXh'''7i gWc k Uf'Y]bgh'X]Y'< Ui dhghUXh'XYg' $\pm$ 0\_U!FY]W\Yg'i bX'\Uh'Y]bY fY]W\Y'i bX'ZUgn]b]YfYbXY'J Yf[ Ub[ Yb\Y]h''
- ) " 6Ygi WXYb G]Y D]gUWb]WXh Yg gY] XYbbž G]Y g]bX Y]b ? Ài ZYf" 8Yf GcbbhU[ ga Uf\_h]b D]gUWž ) \_a j cb 7i gWc YbhZYfbhž V]YhYh Y]bY FY]\Y j cb GY\Ybgk ØfX][ \_Y]hYbž ; YfØWX Yb i bX : UfVYbž ]gh UVYf \_Y]b A i gg ZØf XYb k Yb][ Yf VY[ Y]ghYfhYb ? Ài ZYf" K Ybb G]Y X]Y FY]gY i bhYfbY\a Yb a ÒWXhYbž bY\a Yb G]Y Y]bYb 6i g j cb XYf 5j " Hi ``i a Umc &\$+ f\&\dot{z}) \$D9B\dot{z}\dot{z}+) I G8\dot{z}Y]b 7 c YWh]j c j cb XYf Di di h] GhfYYh f( D9B\dot{z}\dot{z}\dot{z}\dot{z} I G8\dot{z} CXYf Y]b HUI ] j ca GhUXhnYbhfi a fWU" &\$ D9B\dot{z}\dot{z} 1 G8\dot{z}"
- \*" ? Ui ZYb G]Y =\ f 6i gh]W\_Yh ZØf X]Y K Y]hYffY]gY ]a
  GhUXhnYbhfi a "'I bgYf'; Ugh[ YVYf k ]Yg i bg Ui Z'Y]bY
  6i g\U`hYghY``Y 'Ui » Yf\U`V 'XYf GhUXh'\]bž UVYf ]a 'NYbhfi a
  [ ]Vh'Yg : U\f\_UfhYbj Yf\_Ài ZYf" < U`hYb 'G]Y '5i ggWk Ui 'bUWk
  7 fi n'XY` 'Gi fž XUg 'Y]bYb 'ni j Yf`Àgg][ Yb 'GYfj ]WY 'V]YhYh"</pre>
- +" 6Ygi WXYb 'G]Y 'X]Y 'B UnWU!@|b]Ybž 'VYj cf 'G]Y '7i gWc VYgi WXYb "K Ybb 'G]Y 'Ui g '@]a U '\_ca a Ybž 'gc``hYb 'G]Y 'X]Y @|b]Yb 'VYgi WXYbž 'VYj cf 'G]Y 'bUWX '7i gWc '\_ca a Yb " '8]Y F ci hY ']gh 'c[ ]gWXYf 'U`g ']a 'N]W\_nUW\_ '\]b i b X 'ni fØW\_"

a mghYf]ÒgYb B UnWU!@]b]Ybž'k ]Y 'k ]f'g]Y 'j cb'i bgYfYa ': `i [ 'ØVYf'X]Y ; Y[YbX'Ui g'[YgY\Yb'\UVYb

- %" K Ybb'G]Y'A UWki 'D]WWki 'k UbXYfbž'ZfU[Yb'G]Y' → f' < cghY`ž cV'G]Y' → fY'[fc» Yb'HUgWkYb'ZØf'X]Y'8 UiYf'Xcfh``UggYb \_\ObbYb"8]Y'a Y]ghYb'FY]gYj YfUbghU`hYf'\_ObbYb' → f; YdÀW\_'ZØf'G]Y'UiZVYk U\fYbž'k YfXYb'Yg'UVYf'ni gWkÀhnYb'k]ggYbž'k Ybb'G]Y' → fY'Y][YbYb'Jcf\_Y\fib[YbhfYZZYb"'8 Ug'VYXYihYh'bcfa U`Yfk Y]gYž'XUgg'G]Y'bUWk' → fYf FØW\_\_Y\f'Y]bY'BUWkh']a' < cghY`'j YfVf]b[Yb'a ØggYbž'UVYf XUg'k YfXYb'G]Y'k U\fgWkY]b`]Wk'hfchnXYa'hib"
- '": Y]Yfb'G]Y'a ]h'Y]bYa 'D]gWc'Gcif'VY]'@]a c"'9[U`ž'cV'G]Y bUW.'A UW\i 'D]WW\i 'k UbXYfb'cXYf'Y]bY': U\fh'ni a '; ]dZY` Vi W\Ybž'G]Y'k YfXYb'Y]bY'XYf'[fÒ» hYb GY\Ybgk ØfX][\_Y]hYb'Ui Z'YXYf'6i W\_Yh'@]gh'gY\Yb''Y]b g]W\YfYf'; fi bX'ni a ': Y]Yfb"

'U`h1 2 HfUi a nY]h

## 6 Ygi W ]b 7 i gWc 8 Ug K YgYbh ]W Y

K Ug. 6Ygi WX ]b 7i gWcž DYfi "

K c. K ]f ØVYfbUW hYhYb ]a '< cghU`Bi Yj U 5`hUž XUg j cb Y]bYf bYhhYb Y]b\Y]a ]gW Yb : Ua ]`]Y [ YZØ\fh k ]fX" '9g k Uf gi dYf V]``][ ž UVYf Yg k i fXY 'UVYbXg \_Ø\`"J ]Y ``Y]W h a ÒW hYb G]Y g]W ghUhhXYggYb 'ZØf XUg A i bUmW U 7 UgU cXYf XUg MUk Ufa U\_] '< cghY`Yb hgW Y]XYb ž X]Y 'VY]XY j cb A ]hfY]gYb XYb 'gY\f Ya d Zc\`Yb k YfXYb"

K ]Y. 'G]Y'\_ÒbbYb'j cb'@]a U'bUWX'7i gWc'Z']Y[Yb'fl`Ø[Y'ØVYf g\_mgWUbbYf"bYh'Vi WXYbŁ"'HUI ]g'j ca ': `i [\UZYb']bg'GhUXhnYbhfi a

\_cghYb'' \$'D9B'fl'| G8\\\ZØf'c\Z]n]Y``Y'HU| ]g\\\G]\\'\\\'i\ a\\\'i\ a\\\'i\ b\\\'b'\\\'i\ b\\\'i\ b'\\\'i\ b'\\\'i\ b\\\'i\ b'\\\'i\ b'\\\'i\ b'\\\'i\ b'\\\'i\ b'\\\'i\ b'\\'i\ b'\'i\ b'\\'i\ b'\\'i\ b'\\'i\ b'\\'i\ b'\\'i\ b'\\'i\ b'\\'i\ b'\'i\ b'\'i\ b'\\'i\ b'\'i\ b'\'i\'i\ b'\'i\ b'\'i\'i\ b'\'i\ b'\'i\'i\ b'\'i\'i\

8 Y f '6 Y gi W 'j c b '7 i g W c 'k ] f X 'Y f `Y ] W h Y f h ž X U 'Y g '[ i h 'a ] h 'X Y a '6 i g j Y f V i b X Y b '] g h ž 'U V Y f 'f Y W b Y b 'G ] Y 'a ] h `U b [ Y b ': U \ f h Y b . '@] a U 'f & ( Ghi b X Y b Ł ž 'D i b c 'f \* !, 'G h i b X Y b Ł ž '5 f Y e i ] d U 'f % \$ 'G h i b X Y b Ł ž 'B U n W U f % 'G h i b X Y b Ł ž '7 c d U W U V U b U 'f F '! % 'G h i b X Y b Ł i b X '@U 'D U n 'f % & !%) G h i b X Y b Ł "

K ]f Ya d ZY \ `Yb `X]Y `B i hni b [ 'j cb '6cc\_Uk Umž'i a '6i g! ž': À\f! i b X Ni [ h]WYhg ]b `DYfi 'ni 'Z]b XYb "'6i W\ Yb 'G]Y \\]Yf '6i ggY 'b UW\ '7i g\C''

K Y]hYfY' ±b Zcfa Uh]cbYb'ni a '6Ygi WX'j cb'7i gWc'Z]bXYb'G]Y']a @cbY`m'D`UbYh'; i ]XY'hc'DYfi "

 $@Y]hV]`X.^5h`Ug'/^6cchg$ 

8 YhU]`q

6 Ygi WX Yb 'G]Y i bg 'Ui Z 'Y]bY!fY]gY "XY