

9fghY ? `UggY F Ugg]ga i g. 'Ghi hh[Ufhg 5i gghY ``i b['VY `Yi WX hY h' fY WX hY ; Yk U `h

8]Y '5 i gghY ``i b[']b 'Ghi hh[Ufh'h\ Ya Uh]g]Y fh'fUgg]gh]gW\ Y ; Yk U`h'i b X 'V]Y hY h'F Ui a 'ZØf'6]`Xi b['i b X '_f]h]gW\ Y F Y Z Y I]c b "'; Y OZZb Y h' V]g '& + "%\$ "&\$ & ("

 $8]Y `5 i gghY``i b[``9fghY'?`UggY`FUgg]ga i g"`Ghi hh[Ufhg`NYi [b]g `]gh Y]b `VYXYi hYbXYg`9fY][b]gžXUg`g]WX`a]h`XYb :: cfa Yb 'j cb FUgg]ga i g`i bX`8]g_f]a]b]Yfi b[`]b `XYf`\Yi h][Yb `NY]h Ui gY]bUbXYfgYhnh" <math>\Rightarrow$ Y]bYf`K Y`hž]b `XYf`J cfi fhY]`Y`i bX`gcn]U`Yf GhfYgg`\Ài Z][`ni a `5``hU[`[Y\ÒfYbž`V]YhYh`X]YgY`5 i gghY``i b[`Y]bYb FUi a ž`i a `ØVYf`X]Y`j Yf\ÀfhYhYb :: fcbhYb 'j cb`J cfi fhY]`Yb`i bX I b[YfYWXh][_Y]hYb `bUWX ni XYb_Yb"`G]Y`f]WX hYh`g]WX`VYgcbXYfg`Ub A YbgWXYb`a]h`A][fUh]cbg[YgWX]WX hY`i bX`6 \Rightarrow C7gž'i a `XYfYb 9fZU\fi b[Yb`g]WX hVUf`ni `a UWXYb`i bX`ni `h\Ya Uh]g]YfYbž`k]Y N]j]`[YgY``gWX UZh`[Y[Yb`8]g_f]a]b]Yfi b[`a cV]``a UWX h"

8]Y 5i gghY``i b['k]fX'j cb'Y]bYa 'YfZU\fYbYb'HYUa 'Ui g
?i fUhcfi]bbYb'[Y`Y]hYhž'XUfi bhYf': YmmU'8Yfhg]nž'5j fU'9a]bž
A YfgYXY\; \UnUY]ž': U]gU``Cga Ub'i bX';]i `]Ubc'Fm``"'>XYg
A]h[`]YX'Vf]b[h'k Yfhj c``Y'9fZU\fi b[Yb'i bX'DYfgdY_h]j Yb'Ui g
j YfgW\]YXYbYb'J YfY]bYb'i bX'-\b]h]Uh]j Yb'a]hž'X]Y'g]W\'a]h'XYb
< YfUi gZcfXYfi b[Yb'XYg'F Ugg]ga i g'i bX'?c`cb]U`]ga i g
VYgW\AZh][Yb"'8]Y'Ni gUa a YbUfVY]h'a]h'XYf'6`UW_'7ca a i b]hm
: ci bXUh]cb'Y"J "ž'A][fUbh]ZU'Ghi hh[Ufh'i bX'XYf'?i fX]gW\Yb
; Ya Y]bXY'Ghi hh[Ufh'Y"J "'j YfghAf_h'X]Y'6YXYi hi b['i bX'X]Y
6chgW\UZhYb'X]YgYf'DfAgYbhUh]cb"

K $]Wh][YHYAYbibX5_h]cbYb$

9]b`nYbhfU`Yf`6YghUbXhY]``XYf`5i~gghY``i~b[~`g]bX`X]Y`dc`]h]gWXYb

5_h]cbYbžX]Y [Y[Yb A YbgWXYb a]h A][fUh]cbg\]bhYf[fi bX gck]Y
[Y[Yb 6 Dc 7g [Yf]WXhYh g]bX" 9]b dfA[bUbhYg 6Y]gd]Y [gh Y]b
J cfZU```]a Gca a Yf &\$&' ... J Yfa i a a hY DYfgcbYb gh]Y[Yb Ui Z XUg
8 UWX]a DgY`VUX I bhYfhØf_\Y]a ži a fYWXhgYI hfYa Y DUfc`Yb ni
g_UbX]YfYb i bX Y]b fUgg]gh]gWX Yg 6 UbbYf ni nY][Yb" 8]YgYf J cfZU``
ghY\h ghY``j YfhfYhYbX ZØf X]Y ? cbh]bi]hAh XYf fYWXhYb i bX
fUgg]gh]gWX Yb; Yk U`hž X]Y V]g]b X]Y; Y[Ybk Ufh bUWXk]f_h" Gc`WX Y
J cfZA``Y g]bX b]WXh]gc`]Yfhž gcbXYfb HY]``Y]bYg [fÒ» YfYb
[YgY``gWX UZh`]WX Yb DfcV`Ya gž XUg X]Y 5 i gghY``i b['_`Uf i bX
Y]bXf]b[`]WX UI ZhY][h"

8]Y = 1h]UhcfYb : XYf : 5i gghY ``i b[:gY\Yb :g]Y :b]W h b i f : U`g :fY]bY = 2cfa Uh]cbgei Y ``Yž :gcb XYfb : U`g :D`Uhh 2cfa : ZØf :6]`Xi b[:i b X GYbg]V]`]g]Yfi b[":6Ygi W Yfl]bbYb :g]bX :Y]b[Y`UXYbž :]\fY :Y][YbYb A Y]bi b[Yb :ni :V]`XYb :i bX :Ub :8]g_i gg]cbYb :hY]`ni bY\a Yb ":8]Y 5i gghY ``i b[:`AXh :Y]bž :g]W :a]h :XYb :Y][YbYb :J cfi fhY]`Yb :i bX :XYf [YgY ``gW UZh`]W Yb :J YfUbhk cfhi b[:Ui gY]bUbXYfni gYhnYb"

² ZZbi b[gnY]hYb i bX 6Ygi Wkg]bZcfa Uh]cbYb

9fghY'?`UggY'FUgg]ga i g"'Ghi hh[Ufhg'NYi [b]g ']gh'j ca '\$%"'5i [i gh &\$&('V]g'Y]bgW\`]Y»`]W\'&+"'C_hcVYf'&\$&('hÀ[`]W\'j cb'%\$'V]g'%, I\f'[YÒZZbYh"'9g']gh'Y]bY'; Y`Y[Yb\Y]h'ZØf'U``Y'±bhYfYgg]YfhYbž'g]W\ a]h'XYb'H\Ya Yb'FUgg]ga i g'i bX'?c`cb]U`]ga i g']bhYbg]j Yf Ui gY]bUbXYfni gYhnYb'i bX'_f]h]gW\Y'; YXUb_Yb'ni 'Ybhk]W_Y`b"

8]Y'5i gghY``i b['ZfYi h'g]W\'Ui Z'nU\`fY]W\Y'6Ygi W\Yf\]bbYbž'X]Y
VYfY]h'g]bXž'ni '\ÔfYbž'ni '`YfbYb'i bX'g]W\'a]h'XYb
<YfUi gZcfXYfi b[Ybž'XYbYb'A YbgW\Yb'a]h'A][fUh]cbg[YgW\]W\hY
i bX'6\Dc7g'[Y[YbØVYfghY\Ybž'Ui gY]bUbXYfni gYhnYb"'9g'[]`hž'XYb
8]g_i fg'ØVYf'FUgg]ga i g'ni 'ZÔfXYfb'i bX'g]W\'[Ya Y]bgUa 'ZØf'Y]bY
[YfYW\hYfY'; YgY``gW\UZh'Y]bni gYhnYb"'6]`Xi b[ž'5i Z_`Àfi b['i bX
[Ya Y]bgW\UZh`]W\Yg'<UbXY`b'g]bX'GW\`ØggY``ni 'Y]bYa
fYgdY_hi c``YfYb'A]hY]bUbXYf"

 $8]Y `H Ya Yb `F Ugg] ga i g `i b X `8]g_f] a]b] Yfi b [`g] b X `b] W h `b i f ``c_U`]b `Ghi hh[Ufh `j cb `6 Y X Yi hi b [ž `gcb X Y fb `Ui W `[`c V U`" `8 Y f `? Ua d Z [Y [Yb `F Ugg] ga i g `\ Uh `]b `j]Y `Yb `@ Ab X Y fb `i b h Y fg W]Y X `] W Y `: c fa Y b$

Ub[Ybca a Ybžk cVY]'X]Y'[YgY``gW\UZh`]W\Yb'i bX'dc`]h]gW\Yb?cbhYl hY'YbhgW\Y]XYbX'ZØf'X]Y''Yk Y]`][Y'FYU_h]cb'Ui Z'fUgg]gh]gW\Y; Yk U`h'g]bX"' \div 8 Yi hgW\`UbXž'k]Y'Ui W\']b'UbXYfYb'k Ygh`]W\Yb@\bXYfbž']gh'X]Y'Ni bU\a Y'j cb'fYW\hgYl hfYa Yb'5_h]j]h\hYb'i bXFUgg]ga i g']b'XYb'`YhnhYb'\div YygcbXYfg'U`Ufa]YfYbX"'8]YgY9bhk]W_`i b[Yb'g]bX'cZh`]b'gcn]U`Yb'AYX]Yb'g]W\hVUfž'k cU[[fYgg]j Y'\div Yc`c[]Yb'gW\bY``j YfVfY]hYh'k YfXYbž'k Ug'ni 'Y]bYa?`]a U'XYf'5b[gh'i bX'J Yfi bg]W\Yfi b['ZØ\fh"'9]b'6Y]gd]Y`'g]bX'X]YDfchYghY'XYf'6`UW_@j Yg'A UhhYf!6Yk Y[i b[ž'X]Y'Ui W\']b8Yi hgW\`UbX'5b_`Ub['ZUbXYb'i bX'Ui Z'X]Y'JYf_bØdZi b['j cbFUgg]ga i g'i bX'Dc`]nY][Yk U`h'Ui Za Yf_gUa 'a UW\hYb"

8]Y 5i gghY``i b[' 9fghY'? `UggY'F Ugg]ga i g"'Ghi hh[Ufhg'NYi [b]g fYZY_h]Yfh'X]Y'[YgY``gW\UZh`]W\Yb'I a ghÀbXYž']b'XYbYb'gc`W\Y 8]g_i fgY'ghUhhZ]bXYb"'9g'k]fX'h\Ya Uh]g]Yfhž'k]Y'F Ugg]ga i g'Ui W\ghfi _hi fY``'j YfUb_Yfh']ghž'b]W\h'bi f']b']bX]j]Xi Y``Yb'<UbX`i b[Ybž gcbXYfb'Ui W\']b'[YgY``gW\UZh`]W\Yb'\dagbgh]hi h]cbYb'i bX'XYa dc`]h]gW\Yb'GmghYa"

$GYbg]V]^{g}Yfib[XifW.6]Xib[$

9]b 'n Y b hf U 'Y g '5 b '] Y [Y b 'X Y f '5 i gghY '`i b [']gh'X] Y '5 i Z_ 'À f i b ['ØV Y f X] Y 'h] Y Z'j Y f k i fn Y `h Y b 'Ghf i _h i f Y b 'X Y g 'F Ugg]ga i g " 6] 'X i b ['k] f X 'U 'g GWX 'ØggY `n i f 'J Y f À b X Y f i b ['V Y h f U W X h Y h " 'J] Y `Y 'a c X Y f b Y '5 b g À h n Y n i f '6 Y _ À a d Z b ['j c b 'F Ugg]ga i g 'Zc_ i gg] Y f Y b 'X U f U i Zž 'X U g 6 Y k i gg h g Y] b 'ZØf 'X] Y 'Y] [Y b Y b 'J c f i f h Y] `Y 'n i 'g W X À f Z Y b 'i b X \] ghc f] g W Y 'N i g U a a Y b \ À b [Y 'j c b '? c `c b] U `] ga i g 'i b X 'F Ugg] ga i g U i Z n i n Y] [Y b " '8] Y g Y '8] g _ i gg] c b Y b 'h f U [Y b 'k Y g Y b h `] W 'n i f G Y b g] V] `] g] Y f i b ['V Y] 'i b X 'Z O f X Y f b 'Y] b Y '_ f] h] g W X Y 'F Y Z Y I] c b 'Ø V Y f 'X] Y Y [Y b Y 'F c ``Y '] b 'X Y f'; Y g Y ``q W X U Z h "

8i fWX 'K cf_g\cdgž'Jcfhfà[Y'i bX'8]g_i gg]cbgfi bXYb'k]fX'XUg
Di V`]_i a 'Yfa i h][hž'g]WX'U_h]j 'a]h'XYb'H\Ya Yb
Ui gY]bUbXYfni gYhnYb"'8]YgY': cfa 'XYf'dUfh]n]dUh]j Yb'6]`Xi b[']gh
Y]b'k]WX h][Yf'GWXf]hhži a 'Jcfi fhY]`Y'UVni VUi Yb'i bX'XYb
[YgY``gWXUZh`]WXYb'Ni gUa a Yb\U`h'ni 'ghÀf_Yb"'J]Y`Y'X]YgYf
Dfc'Y_hY'kYfXYb'j cb'`c_U`Yb'\#o]h]Uh]j Ybž'k]Y'XYb
?ccdYfUh]cbgdUfhbYfb'XYf'5i gghY``i b[ž'[YhfU[Yb'i bX'a ØggYb

FYgh]hi h]cb i bX XUg 9fVY XYg ? c cb]U]ga i g

9]b'k Y]hYfYf'5gdY_hž'XYf']b'XYf'5i gghY``i b['VY\UbXY`h'k]fXž']gh X]Y'8]g_i gg]cb'ØVYf'FYgh]hi h]cb"'?c`cb]U`Y'FUi V[ØhYf'i bX'X]Y 5i ZUfVY]hi b['_c`cb]U`Yf'JYf[Y\Yb'g]bX'H\Ya Ybž'X]Y'k Y`hk Y]h X]g_i h]Yfh'k YfXYb"'\dangle 8Yi hgW\`UbX']gh'X]Y'8]g_i gg]cb'ØVYf'X]Y FØW_[UVY'j cb'UfhYZU_h]gW\Yb'GUa a `i b[Yb'Ub'X]Y'Y\Ya U`][Yb ?c`cb]Yb'HY]`'Y]bYf'VfY]hYfYb'8YVUhhY'ØVYf'; YfYW\h][_Y]h'i bX JYfgÒ\bi b["'\dangle gh]hi h]cbYb'i bX'A i gYYb'g]bX'[YZcfXYfhž'g]W\'a]h]\fYb'\]ghcf]gW\Yb'GUa a `i b[Yb'i bX'XYfYb'<Yf_i bZh Ui qY]bUbXYfni qYhnYb"

± j]Y`Yb ghÀXh]gWX Yb ± jh]Uh]j Yb k]fX j Yfgi WX hž a Y\f 6Yk i gghgY]b ZØf X]Y [YgWX]WX h`]WX Yb <]bhYf[fØbXY ni gWX UZZYb ii bX Y]bYb 8]U`c['ØVYf X]Y J YfUbhk cfhi b['XYf \ Yi h][Yb ; YgY``gWX UZh ni Yfa Ò[`]WX Yb " 8]YgY 8]g_i gg]cb]gh'Ui WX k]WX h]['ZØf X]Y → XYbh]hÀh i bX 'XUg 'GY`Vghj YfghÀbXb]g j cb 'A YbgWX Yb a]h A][fUh]cbg\]bhYf[fi bXž XU 'g]Y c Zh]b 'Y]bYa '_ca d `Yl Yb GdUbbi b[gZY`X nk]gWX Yb '_i `hi fY``Yf 5bYf_Ybbi b[ii bX 8]g_f]a]b]Yfi b['bUj][]YfYb 'a ØggYb"

8 Y hU]`q

6 Y gi W Y b 'G] Y 'i b g 'U i Z 'b ! U ["X Y