

HØf_Y]'YbhXYW_Yb.'Jcb'=ghUbVi `g'5`hghUXh V]g'ni f'Ÿ[À]g'i bX'7UddUXcW]U

9bhXYW_Yb'G]Y'X]Y'HØf_Y]. j cb'=ghUbVi `g'\]ghcf]gWXYb GWAhnYb'ØVYf'_i `]bUf]gWXY'; YbØggY'V]g'ni UhYa VYfUi VYbXYb'GhfÀbXYb'i bX'5VYbhYi Yfb']a HUi fi g[YV]f[Y"



K]`_ca a Yb`ni `Y]bYf`i bj Yf[Ygg`]WXYb`9bhXYW_i b[gfY]gY`Xi fWX X]Y`UhYa VYfUi VYbXY`HØf_Y]``8]YgYg`@UbXž`XUg`X]Y`6fØW_Y nk]gWXYb`9i fcdU'i bX`5g]Yb`gWX`À[hž`]gh`VY_Ubbh`ZØf`gY]bY ZUgn]b]YfYbXY`; YgWX]WX hYž_i `]bUf]gWXYb`? Ògh`]WX_Y]hYb`i bX UhYa VYfUi VYbXYb`@UbXgWXUZhYb"`9[U`ž`cV`Xi `Y]b`; YgWX]WX hgZUb V]ghž`XYf`X]Y`\]ghcf]gWXYb`GhÀhhYb`j cb`=ghUbVi ``Yf_i bXYb`a ÒWX hYž Y]b`; Y]bgWXa YW_Yfž`XYf`X]Y`; Y\Y]a b]ggY`XYf`hØf_]gWXYb`? ØWXY YbhXYW_Yb`k]``ž`cXYf`Y]b`5VYbhYi Yf`i gh][Yfž`XYf`X]Y`gWX fcZZYb;]dZY``XYg`HUi fi g[YV]f[Yg`YfcVYfb`a ÒWX hY` `X]Y`HØf_Y]`\Uh`ZØf YXYb`YhK Ug`ni `V]YhYb"

± X]YgYa '5fh]_Y`'bY\a Yb'k]f'X]W\ 'a]h'Ui Z'Y]bY'FY]gYž'X]Y'j cb XYb'`YV\UZhYb'GhfU» Yb'XYf'5`hghUXh' ⊕hUbVi `g'ØVYf'X]Y hfUi a \UZhYb'GhfÀbXY'XYf'Ÿ[À]g'V]g'\]b'ni 'XYb'a U'YghÀh]gW\Yb 6U``cbZU\fhYb'ØVYf'X]Y'gi ffYU`Yb'@UbXgW\UZhYb'? UddUXc_]Ybg fY]W\h'''@Ugg'X]W\'j cb'XYf'fY]W\Yb'?i `hi f'i bX'XYb'HfUX]h]cbYbž'X]Y X]YgYg'ZUgn]b]YfYbXY'@UbX'dfÀ[Ybž']bgd]f]YfYb'i bX'[Yb]Y» Y'X]Y J]Y`ZU`h'XYf'5_h]j]hÀhYbž'X]Y'X]Y'hØf_]gW\Y'F]j]YfU'i bX'X]Y'6Yf[Yni 'V]YhYb'\UVYb"

6YfY]hY'X]WX'XUfUi Z'j cfž']b'Y]b'@UbX'Y]bni hUi WXYbž']b'XYa 'YXYg N]Y`Y]bY'bYi Y'; YgWX]WXhY'ni 'YfnÀ\`Yb'\Uh'i bX'YXY'A U\`nY]h'Y]b : Ygh'ZØf'X]Y'G]bbY']gh'''@Ugg'i bg'[Ya Y]bgUa 'X]Y'K i bXYf'XYf HØf_Y]'YbhXYW_Yb°

9bhXYW_i b[gfY]gY`]b`X]Y`\]ghcf]gW\Y`5`hghUXh j cb`=ghUbVi`

=ghUbVi `z̄'X]Y Y]bn][Y GhUXhz̄'X]Y g]WX ØVYf nk Y] ? cbh]bYbhY
YfghfYW_hz̄']gh'Y]b ZUgn]b]YfYbXYg GWXa Y`nh]Y[Y`'j cb'?i `hi fYbz̄
FY`][]cbYb'i bX'; YgWX]WXhY" 8]Y \]ghcf]gWXY 5`hghUXhz̄'Ui WX
VY_Ubbh'U`g'Gi `hUbU\a Yhz̄']gh'XUg' < YfnghØW_'X]YgYf
VYa Yf_Ybgk YfhYb'A Yhfcdc`Y'i bX'n]Y\h'YXYg'*J\f'A]``]cbYb'j cb
6Ygi WXYfb'Ui g'U``Yf'K Y`h'Ub"'9]b'GdUn]Yf[Ub['Xi fWX'X]YgY
GhfU» Yb']gh'k]Y'Y]bY'FY]gY'Xi fWX'X]Y'NY]hz̄'k c'Ubh]_Y'6Ui k Yf_Y
i bX'a cXYfbY'9]bZØggY'Zf]YX`]WX'_cYI]gh]YfYb"</pre>

9]b 'UVgc `i hYg'A i gg'VY]' → fYa '6Ygi W\']b 'XYf'5 `hghUXh']gh'X]Y'
< U[]U'Gcd\]U"'I fgdfØb[`]W\'U`g'?]fW\Y']a '* "'⅓U\f\i bXYfh'YfVUi hž
gdÀhYf'ni f'A cgW\YY'i a [Yk UbXY`h'i bX'\Yi hni hU[Y'Y]b

ZUgn]b]YfYbXYg'A i gYi a ž']gh'X]YgYg'UfW\]hY_hcb]gW\Y'A Y]ghYfk Yf_

VY_Ubbh'ZØf'gY]bY'[Yk U`h][Y'?i ddY`i bX'VYY]bXfi W_YbXYb

A cgU]_Yb"'8]Y'U_i gh]gW\Y'DYfZY_h]cb'i bX'X]Y'cdi `YbhY'J Yfn]Yfi b[
k YfXYb'G]Y']b'GhUi bYb'j YfgYhnYb"

I ba]hhY`VUf']b`XYf'BÀ\Y'VYZ]bXYh'g]W\'X]Y'6`Ui Y'A cgW\YY fGi`hUb!5\a YX!A cgW\YYŁŽ'Y]b'k Y]hYfYg']_cb]gW\Yg'6Ui k Yf_Ž'XUg ZØf'gY]bY'gYW\g'A]bUfYhhY'i bX'gY]bY'UhYa VYfUi VYbXYb'V`Ui Yb: `]YqYb'VY_Ubbh']qh''6Yqi W\Yf'q]bX'\Yfn`]W\'Y]b[Y`UXYbZ'X]Y

A cgW\YY'ni 'VYhfYhYbž'YXcW\']gh'Yg'k]W\h][ž'fYgdY_hj c``Y ?`Y]Xi b['ni 'hfU[Ybž'k Ug'VYXYi hYhž'XUgg': fUi Yb']\f'<UUf VYXYW_Yb'i bX'VY]XY'; YgW\`YW\hYf'`Ub[Y'<cgYb'cXYf'F OW_Y Ubn]Y\Yb'gc``hYb"

9]b'k Y]hYfYf'VYXYi hYbXYf'C fh']b'Gi `hUbU\a Yh']gh'XYf'Hcd_Ud]!
DU`Ughž'X]Y'Y\Ya U`][Y'FYg]XYbn'XYf'cga Ub]gWXYb'Gi `hUbY"'8Yf
DU`Ugh'V]YhYh'b]WXh'bi f'Y]bYb'9]bV`]W_']b'XUg'cdi `YbhY'@YVYb'XYf
Gi `hUbYž'gcbXYfb'VY\YfVYf[h'Ui WX'a Y\fYfY'A i ggYYbž'XUfi bhYf
X]Y'GUa a `i b['fY`][']ÒgYf'FY`]ei]Yb"'8]Y'; UfhYb`UbXgWXUZh'a]h
6`]W_'Ui Z'XYb'6cgdcfi g']gh'XYf'dYfZY_hY'Cfh'ZØf'Y]bY'DUi gYž
k À\fYbX'G]Y'X]Y'UhYa VYfUi VYbXY'5i gg]WXh'[Yb]Y»Yb"

5fh]_Y`	6YgcbXYf\Y]hYb
---------	----------------

HYdd]WXY	< UbX[YZYfh][hY'GhØW_Y'a]h	
	Y]bn][Ufh][Yb [·] AighYfb	
; Yk ØfnY	5fca Yb'Ui g'U``Yb'9W_Yb'XYf	
	K Y`h	
GWX a i W_	HfUX]h]cbY``Yf'i bX	
	nY]h[YbÒgg]gWXYf'GWXaiW_	
HYY[YgWX]ff	9`Y[UbhY'GYhg'ZØf'⇒fY	
	HYYghi bXY	

BUWXXYa 'G]Y'X]Y'EiVig'XYg'6UgUfg'Yf_ibXYh'\UVYbž'gc``hYb'G]Y
Ui Z'_Y]bYb': U```XYb'6Ug]`]WU!N]ghYfbY'j Yf[YggYbž'Y]bY
ibhYf]fX]gWXY'K UggYfghÀhhYž'X]Y'VYY]bXfi W_YbXY'GÀi `Yb'ibX
a mgh]gWXY'6Y`YiWXhib['V]YhYh"'<]Yf'_ÒbbYb'G]Y'Y]bYb'<UiWX'jcb;YgWX]WXhY'gdØfYb'ibX'X]Y'_Ø\`Y'@iZh'[Yb]Y»Ybž'kÀ\fYbX'G]Y'X]Y
[Y\Y]ab]gjc``Y'5hacgd\ÀfY'VYkibXYfb"'8]YgYg'U`hY'K UggYfhUb_!

GmghYa ž'XUg']b'XYf'VmnUbh]b]gW\Yb'NY]h'YfVUi h'k i fXYž'V]YhYh'Y]bYZUgn]b]YfYbXY'5Vk YW\g`i b['ni a '[YgW\ÀZh][Yb'HfY]VYb'XYf'GhUXhXUfØVYf"

9]b 'UbXYfYf'gWX ObYf'C fh']b 'XYf'5 `hghUXh']gh'XYf' <]ddcXfca ž'XYf Y]bgh'NYbhfi a 'XYf'fOa]gWXYb 'K U[YbfYbbYb 'k Uf"'8]Y', VYffYghY XYf'GÀi `Yb'i bX'8Yb_a À`Yfž'X]Y'\]Yf'ghY\Ybž'YfnÀ\`Yb'j]Y`Y ; YgWX]WXhYb'Ui g'XYf'J Yf[Ub[Yb\Y]h/'XYf'C VY`]g_'j cb'H\YcXcg]i g i bX'X]Y'GYfdYbhYbgÀi `Y'g]bX'bi f'Y]b][Y'XUj cbž'X]Y'\Rightarrow fYb GdUn]Yf[Ub['k ØfnYb'k YfXYb"

5V[YgY\Yb'jcb'XYb'UfW\]hY_hcb]gW\Yb'K i bXYfb'gc``hYb'G]Y'g]W\Ui W\'NY]h'bY\a Ybži a 'g]W\']b'Y]bYa 'XYf'j]Y`Yb'hfUX]h]cbY``Yb7UZÅg'ni 'YbhgdUbbYb''; Yb]Y» Yb'G]Y'Y]bYb'hØf_]gW\Yb'?UZZYYcXYf'HYY'i bX'`UggYb'G]Y'XUg'; YgW\Y\Yb'i a 'G]Y'\Yfi a 'Ui Z'g]W\k]f_Yb''8]Y'\Yfn`]W\Y'5ha cgd\ÀfY'i bX'X]Y': fYi bX`]W_Y]h'XYf A YbgW\Yb'hfU[Yb'bi f'ni 'X]YgYa 'Ui h\Ybh]gW\Yb'9f`YVb]g'VY]"

8]Y'5`hghUXh'j cb'=ghUbVi``]gh'a Y\f'U`g'bi f'Y]b'FY]gYn]Y`/'g]Y']gh'Y]b

YVYbX][Yg'; YgWX]WX hgVi WX Z'XUg'VY]'^YXYa '6Ygi WX'bYi Y

; YgWX]WX hYb'YfnÀ\`h''9[U`Z'cV'G]Y'Ub'; YgWX]WX hY']bhYfYgg]Yfh'g]bXZ
?i`hi f'Yf`YVYb'a ÒWX hYb'cXYf'Y]bZUWX'bi f'X]Y'UhYa VYfUi VYbXY

5fWX]hY_hi f'VYk i bXYfb'k c``YbZ'Gi`hUbU\a Yh'\Uh'ZØf'^YXYb'Yhk Ug
ni 'V]YhYb"

: Øf`a Y\f`±oZcfa Uh]cbYb`ØVYf`X]YgY`\]ghcf]gW\Yb`GhÀhhYb`i bXkY]hYfY`H]ddg`ni f`9f_i bXi b[`j cb`=ghUbVi `ž'VYgi W\Yb`G]Y`X]YcZZ]n]Y``Y`K YVg]hY`XYf`GhUXh`i bhYf`]ghUbVi `"[cj "hf"

?i`]bUf]gWXY'?Ògh`]WX_Y]hYb'i bX ;Y\Y]a h]ddg'XYf'HØf_]gWXYb'?ØWXY

8]Y'hØf_]gW\Y'?ØW\Y'[]`h'U`g'Y]bY'XYf'j]Y`ZÀ`h][ghYb'i bX gW\a UW_\UZhYghYb'XYf'K Y`h"'A]h'Y]bYa 'fY]W\Yb'9fVYž'XUg'j cb XYb'9]bZØggYb'XYg'C ga Ub]gW\Yb'FY]W\Yg'V]g'\]b'ni 'fY[]cbU`Yb GdYn]U`]hÀhYb'fY]W\hž'V]YhYh'g]Y'ZØf'YXYb'; Ui a Yb'Yhk Ug"'6Y] Y]bYa '6Ygi W\']b'XYf'HØf_Y]'XUfZ'a Ub'X]Y'_i `]bUf]gW\Yb <][\`][\hg'Ui Z'_Y]bYb': U``j YfdUggYb''@UggYb'G]Y'i bg'Y]b][Y'XYf

 $VYghYb ? Ogh`]WX_Y]hYb i bX'; Y Y a h]ddg`Yf_i bXYbž`X]Y`X]Y hØf_]gWXY'; Ughfcbca]Y ni `V]YhYb` \ Uh''$

9]b UVgc `i hYg ʿA i gg ʿg]b X <code>? YVUV!; Yf]WX hY</code> " 8]YgY ʿgWX a UW_\UZhYb : `Y]gWX gd]Y » Y ˙g]b X ˙]b ˙j YfgWX]YXYb Yb ˙J Uf]Ub hYb ˙Yf\ À `h`]WX ž ˙j c b ˙ 8 Ob Yf ˙? YVUV ˙V]g `\]b ˙ni ˙5 XUb U˙? YVUV ¨ 6 Ygc b XYfg `\ Yfj c fni \ YVYb]gh `XYf ˙8 Ob Yf ˙? YVUV ž `XYf ˙Ui g ˙nUfhYa ž ˙[Yk ØfnhYa ˙: `Y]gWX ˙VYghY\hž XUg ``Ub [gUa ˙Ui Z ˙Y]b Ya ˙8 fY\gd]Y » ˙[Y[Ufh˙k]f X ¨ · GYfj]Yfh˙]b ˙Y]b Ya : `UXYb Vfc h˙a]h ˙Zf]gWX Ya ˙; Ya ØgY ˙i b X $oldsymbol{`}$ e [\ i fhgc » Yž ˙]gh ˙Yf ˙b]WX h b i f ˙Y]b ˙VY`]Y VhYf ˙Gb U W_ž ˙gc b XYfb ˙Ui WX ˙Y]b Y ˙gÀ hh][Yb XY ˙A U\`nY]h ¨

9]b'k Y]hYfYg'<][\`][\h'XYf'hØf_]gW\Yb'?ØW\Y'g]bX'X]Y'**A** YnY" 8]YgY'_`Y]bYb'JcfgdY]gYb'g]bX'dYfZY_h'ZØf'[YgY``][Y'FibXYb'ibX V]YhYb'Y]bY'VibhY'J]Y`ZU`h'Ub'5fcaYb"'Ni'XYb'VY`]YVhYghYb'AYnY [Y\OfYb.

- <i a a i g. '7fYa][Y'?]W\YfYfVgYbdUghYž'cZh'a]h'C`]j YbÒ`
 i bX'DUdf]_U'gYfj]Yfh"</pre>
- 6UVU[Ubcig\. FUi WkUfca Uh]gWkY 5i VYf[]bYbdUghYžX]Y g]Wk]XYU`ni Zf]gWkYa 6fch'Y][bYh"
- : YhU'a]h'C`]j Yb. '?fØa Y`][Yf': YhUž'c Zh'[Ufb]Yfh'a]h Zf]gWXYb'C`]j Yb'i bX'C`]j YbÒ'"

8]Y'GØ» gdY]gYb']b'XYf'HØf_Y]'g]bX'YVYbZU``g'VYa Yf_Ybgk Yfh'''
6U_`Uj Už'Y]bY'_Ògh`]W\Y'; YVÀW_!GdYn]U`]hÀh'Ui g'GW\]W\hYb'j cb
:]`chY][ž'[YZØ``h'a]h'K U`bØggYb'cXYf'D]ghUn]Ybž'i bX']b'<cb][g]fi d
[YhfÀb_hž']gh'Y]b'k U\fYf'; Ybi gg"'9]b'k Y]hYfYf'gØ» Yf'; Y\Y]a h]dd
]gh'?ØbYZYž'Y]b'k Ufa Yf'?ÀgYdi XX]b[ž'XYf'a]h'Ni W_Yfg]fi d
ØVYf[cggYb'i bX'a]h'D]ghUn]Yb'VYghfYi h'gYfj]Yfh'k]fX"'8]Y

Yf]W\h 6YgW\fY]Vi b[

8 ObYf?YVUV	; Yk ØfnhYg': `Y]gW\ž'gYfj]Yfh']b	
	:`UXYbVfch'a]h'; Ya ØgY"	
AYnY	?`Y]bY`JcfgdY]gYbž'X]Y`Y]bY	
	J]Y`nU\``Ub'; YgW\a ÀW_Yfb	
	V]Y hY b "	
HYgh] '? YVUV	: `Y]gWX i bX ; Ya ØgY jb Y]bYa	
	HcbhcdZni VYfY]hYhii bX	
	gYfj]Yfh"	

9]b; Y\Y]a h]dd \mathbb{Z} f X]Y k U\fYb; ci fa Yhg g]b X X]Y j YfghY W_hYb F YghUi fUb hg]b =ghUb Vi \mathbb{Z} X]Y c Zh j cb 9]b\Y]a]gWX Yb VYgi WX h k YfXYb" 8]YgY $@c_UY$ V]YhYb Ui h\Ybh]gWX Yž\Ui g[Ya UWXhY hØf_]gWXY; Yf]WX hYžX]Y b]WX h Ui Z Hci f]ghYb Ui g[Yf]WX hYh g]b X" : fU[Yb G]Y X]Y 9]b\Y]a]gWX Yb bUWX]\fYb @JYV \]b[gd \AhnYb \Z i a k]f_\]WX Y]bn][Ufh][Y _i \]bUf]gWX Y 9f \YVb]ggY ni gUa a Y \b"

8]Y'hØf_]gWXY'?ØWXY'`Y[h'Ui WX'[fc»Yb'K Yfh'Ui Z': f]gWXY"'J]Y`Y
A Àf_hY']b'XYb'j YfgWX]YXYbYb'GhÀXhYb'g]bX'a]h'Zf]gWXYb'?fÀi hYfbž
; Ya ØgY'i bX'; Yk ØfnYb'ØVYfgÀh"'6Ygi WXYb'G]Y'XYb'; fUbX
6UnUUf']b'=ghUbVi ``cXYf'UbXYfY'`c_U`Y'A Àf_hYž'i a 'X]Y'VYghYb
Ni hUhYb'ni 'Z]bXYb'i bX'j]Y``Y]WXh'gc[Uf'Ub'Y]bYa '?cWX_i fg
hY]`ni bY\a Ybž'i a 'X]Y'; Y\Y]a b]ggY'XYf'hØf_]gWXYb'?ØWXY'ni
Yf`YfbYb"

8]Y?ca V]bUh]cb'Ui g'Zf]gWXYb'Ni hUhYbž'j]Y`ZÀ`h][Yb'5fca Yb'i bXUhYb'HfUX]h]cbYb'a UWXh'XUg'9ggYb']b'XYf'HØf_Y]'ni 'Y]bYa i bj Yf[Ygg`]WXYb'9f`YVb]g"'CV']b'Y]bYa 'GhfU» YbghUbXž'Y]bYa _`Y]bYb'6]ghfc'cXYf'Y]bYa 'hfUX]h]cbY``Yb'FYghUi fUbh' 'YXY A U\`nY]h'V]YhYh'X]Y'A Ò[`]WX_Y]hž'X]Y'?i `hi f'i bX'X]Y; UghZfYi bXgWXUZh'X]YgYg'ZUgn]b]YfYbXYb'@UbXYg'ni '[Yb]Y» Yb"

HfUi a \ UZhY 'GhfÀbXY 'i bX 'j YfVcf[YbYg DUfUX]Yg 'Ub 'XYf 'Ÿ [À]g

GcbbYbUbVYhYf"'8]YgY'FY[]cb'XYf'HØf_Y]']gh'VYfØ\a h'ZØf']\fYibVYfØ\fhYb'GhfÀbXYž'UhYa VYfUi VYbXYb'6i W\hYb'i bX'XUg ØVYfUi g'_`UfY'K UggYf"'K Ybb'G]Y'Ui Z'XYf'Gi W\Y'bUW\'Y]bYa]Xm``]gW\Yb'GhfUbXi f`Ui V'g]bXž'g]bX'G]Y'\]Yf'[YbUi 'f]W\h]["

 $8]Y `HØf_]gWX Y `Ÿ [\grave{A}]g `YfghfY W_h `g]WX `Ybh`Ub [`XYf`K Ygh_ØghY`XYf HØf_Y] `i b X `V]YhYh`nU\`fY]WX Y `8 Ygh]b Uh]c b Ybž`X]Y `ZØf` YXYb FY]gYb XYb `Yhk Ug `ni `V]YhYb `\UVYb "'<]Yf `g]b X `Y]b][Y `XYf \YfUi gfU[Yb XghYb `GhfÀb XY `i b X `j YfghY W_hYb `DUfUX]YgYž`X]Y `G]Y Yf_i b XYb `gc ``hYb.$

- 2 `ØXYb]n. '6YfØ\a h'ZØf'gY]bY'k i bXYfgW\ÒbY'@U[i bY'i bX XYb'GhfUbX'a]h'ZY]bYa 'k Y]» Yb'GUbXž'[]`h'2 `ØXYb]n'U`g Y]bYf'XYf'gW\ÒbghYb'GhfÀbXY'XYf'K Y`h"'8]Y'l a [YVi b[Yb g]bX'Ui W\'dYfZY_h'ZØf'DUfU[`]X]b["
- £]fU`]. '8]YgYf'fi \][Y'GhfUbX']gh'HY]`'Y]bYg
 BUhi fgWXi hn[YV]Yhg'i bX'V]YhYh'Y]bY'Y]bn][Ufh][Y
 5ha cgd\ÀfY"'<]Yf'_ÒbbYb'G]Y'Ui WX'X]Y'VYfØ\a hYb
 9hYfbU`': `Ua Yg 'VYg]WXh][Ybž'k c'bUhØf`]WXY'; UgY'Ui g
 XYa '6cXYb'Ybhk Y]WXYb"
- ? n_U`Yg]. '5i WX 'VY_Ubbh'U`g'XUg' A ÀXWXYb!GWX `cgg ž XUb_'XYf'_`Y]bYb'6i f[']a 'A YYf"'8Yf'GhfUbX'V]YhYh'Y]bY gWX ObY'5i gg]WXh'Ui Z'X]Y': Yghi b['i bX']gh']XYU`'ZØf : Ua]`]Yb"
- 5_mU_U. '9]b'j YfghYW_hYg'¾ k Y``a]h'ZY]bYb'GUbXghfÀbXYb i bX'_f]ghU``_`UfYa 'K UggYf"'5VYf'Ui W\'X]Y'i a `]Y[YbXYb ?]YZYfbk À`XYf'`UXYb'ni a '9bhgdUbbYb'Y]b"
- ; Øa Ø `Ø_. '9\Ya U`g'XUg'Ubh]_Y'A mbXcgž'g]bX'\]Yf'bcW\Fi]bYb'g]W\hVUf"'8Yf'GhfUbX'\Uh'Y]bY'YbhgdUbbhY
 5ha cgd\ÀfY'i bX']gh']XYU`'ZØf':]gW\`]YV\UVYfž'XU'X]Y
 [`Y]W\bUa][Yb'FYghUi fUbhg'Zf]gW\Y'A YYfYgZfØW\hY
 UbV]YhYb"

8]Y GhfàbXY XYf Y [À]g g]bX b]W h bi f UhYa VYfUi VYbXž gcbXYfb Ui W j]Y ZÀ h][' j cb VY YVhYbž hci f]gh]gW Yb < chgdchg V]g \]b ni gh]`Ybž [Y\Y]a Yb 6i W hYbž X]Y Yg k Yfh g]bXž YbhXYW_h ni k YfXYb" 6YgcbXYfg Yfk À\bYbgk Yfh]gh Ui W X]Y [i hY 9ffY]W VUf_Y]h XYf GhfàbXY/j]Y Y g]bX j cb GhÀXhYb k]Y 6cXfi a ž: Yh\]mY cXYf

A Ufa Uf]g'Ui g'Y]bZUW\'a]h'XYa '5i hc'cXYf'ÒZZYbh`]W\Yb JYf_Y\fga]hhY`b'ni 'YffY]W\Yb"

8 UfØVYf`\]bUi g`g]bX`X]Y`À[À]gW\Yb`GhfÀbXY`b]W\h'bi f`hU[gØVYf Y]b`9f`YVb]g"`8]Y`5VYbXY`j Yfk UbXY`b`g]W\`cZh`]b`a U[]gW\Y 9f`YVb]ggYž'k Ybb`X]Y`GcbbY`i bhYf[Y\h'i bX`X]Y`GhfÀbXY`]b k Ufa Yg`@]W\h`[YhUi W\h'k YfXYb"`@c_U`Y`6Ufg`i bX`FYghUi fUbhg V]YhYb`Zf]gW\Y`GdY]gYb`i bX`; YhfÀb_Yž'gcXUgg`G]Y`XYb`5VYbX`a]h Y]bYa`\Yff`]W\Yb`6`]W_`Ui Z`XUg`A YYf`Ui g_`]b[Yb``UggYb`_ObbYb"

9]b'k Y]hYfYg'<][\`][\h'XYf'Ÿ[À]g']gh'X]Y'AÒ[`]WX_Y]hž'Ui g[YXY\bhY6cchghci fYb'ni ii bhYfbY\a Yb"'CV'G]Y'Y]bY'df]j UhY'MUW\h'a]YhYbcXYf'Ub'Y]bYf'[YZØ\fhYb'Hci f'hY]`bY\a Yb'a ÒW\hYb'' X]Y
9f_i bXi b['XYf'j YfghYW_hYb'6i W\hYb'i bX'_`Y]bYb'\DgY`b'fi bX'i a X]Y'?ØghY']gh'Y]bY'9fZU\fi b[ž'X]Y'G]Y'b]W\h'j YfdUggYb'gc``hYb"'CZh_\ObbYb'G]Y'XUVY]'Ui W\gW\bcfW\Y`b'cXYf'gc[Uf'hUi W\Ybž'i a 'X]Y\YY]bXfi W_YbXY'I bhYfk UggYfk Y`h'XYf'FY[]cb'ni 'YbhXYW_Yb"

: Øf'X]Y'5_h]j YfYb'i bhYf'⇒bYb'[]Vh'Yg'Ui W\'nU\`fY]W\Y
A Ò[`]W_Y]hYbž'g]W\']b'K UggYfgdcfhUfhYb'ni 'j Yfgi W\Yb"'Jcb
K]bXgi fZYb'i bX'?]hYgi fZYb'V]g'\]b'ni '? U'U_ZU\fYb'i bX'GhUbX!I d!
DUXX`]b['''X]Y'Ÿ[A]g'V]YhYh'ZØf'YXYb'; YgW\a UW_'Yhk Ug"
Gdcfh`]W\Y'6Ygi W\Yf'_ObbYb'g]W\'Ui W\'XYa 'HfY__]b['Ui Z'XYb
i a `]Y[YbXYb'K UbXYfk Y[Yb'k]Xa Yb/XYf'VYfØ\a hY'@m_Ybk Y[
]gh'bi f'Y]bY'XYf'j]Y`Yb'A Ò[`]W_Y]hYbž'X]Y'BUhi f'\Ui hbU\'ni
Yf`YVYb"

K Ybb'G]Y'd`UbYbž'X]Y'GhfÀbXY'XYf'HØf_]gWXYb'Ÿ[À]g'ni 'Yf_i bXYbž []Vh'Yg'j]Y`Y'Cdh]cbYb'ZØf'I bhYf_ØbZhY"'Jcb'`i lif]ÒgYb'FYgcfhg V]g'\]b'ni'[Ya Øh`]WXYb'DYbg]cbYb'cXYf'gc[Uf'7Uad]b[d`ÀhnYb'X]YgY'FY[]cb'V]YhYh'ZØf'YXYg'6i X[Yh'Yhk Ug"'6Y`]YVhY'GhÀXhY'k]Y

6cXfi a 'i bX': Yh\]mY'\UVYb'Y]b'fY]W\Yg'5b[YVch'Ub I bhYf_ØbZhYbž'k À\fYbX'_`Y]bYfY'8 ÒfZYf'k]Y'5_mU_U'Y]bY Zf]YX`]W\Y'5i qnY]h'V]YhYb'_ÒbbYb"

Ni gUa a Yb[YZUgghi]ghiX]YiŸ[À]gib]Wkhibi fiZØfi]\fYb
UhYa VYfUi VYbXYbibUhØfi]WkYbi7\Ufa YiVY_UbbhžigcbXYfbiUi Wk
ZØfi]\fYifY]WkYi?i `hi fii bXi; YgWk]WkhY"i6Y]Y]bYa i6Ygi WkiXYf
FY[]cbigc``hYbiG]YiUi WkiX]Yi`c_U`YbiA Àf_hYii bXi_i `hi fY``Yb
J YfUbghU`hi b[Ybib]Wkhij YfdUggYbžiX]YiG]Yi]biX]YihfUX]h]cbY``
hØf_]gWkYi@YVYbgkY]gYiY]bhUi WkYbi`UggYb"

5 V Y b h Y i Y f '] a 'HUi fi g[YV] f[Y'i b X'C i h X c c f! 5 _ h] j] h À h Y b

8 UgʻHUi fi g[YV]f[YžY]bYʻXYfʻVYY]bXfi W_YbXghYbʻ6Yf[_YhhYbʻXYf
HØf_Y]žYfghfYW_hʻg]W\ʻXi fW\ʻX]YʻGØXhØf_Y]ʻi bXʻ]ghʻY]bʻk U\fYg
DUfUX]YgʻZØfʻCi hXccf!9bh\i g]UghYbʻi bXʻ5VYbhYi YffY]gYbXY"`A]h
gY]bYbʻgW\bYYVYXYW_hYbʻ;]dZY`bžʻh]YZYbʻHÀ`Yfbʻi bXʻ_`UfYa
K UggYfʻ\UhʻX]YgYʻFY[]cbʻZØfʻYXYbʻYhk Ugʻni 'V]YhYbʻ'j cb
K UbXYfbʻØVYfʻ? 'YhhYfbʻV]gʻ\]bʻni 'UhYa VYfUi VYbXYbʻ¾Yd!
GUZUf]g"

K Yf'X]Y'B Uhi f']b']\fYf'fY]bghYb': cfa 'Yf`YVYb'a ÒW\hYž'gc``hY'X]Y $nU\fY$]W\Yb'K UbXYfk Y[Y'XYg'HUi fi g[YV]f[Yg'Yf_i bXYb"'8]Y VY`]YVhYghYb'K $UbXYfghfYW_Yb'g]bX$.

- 8]Y'@]_mU'Mc`i 'fl@m_]gWXY'GhfU»YŁ.'8]YgY'VYfØ\a hY
 K UbXYffci hY'ZØ\fh'Ybh`Ub['XYf'?ØghY'i bX'Xi fWX'XUg
 HUi fi g[YV]f[Y"'G]Y'V]YhYh'gdY_hU_i `ÀfY'5i gV`]W_Y'Ui Z'XUg
 A YYf'i bX'X]Y'i a `]Y[YbXYb'@UbXgWXUZhYb"
- 8 Y f '5 `UXU[`Uf! B Uh]c b U`d Uf_. "=XYU`Yf' C fh' ZØf B Uhi f`]YV\UVYfž'a]h'Yb X`cgYb'A Ò[`]WX_Y]hYb'ni a HfY__]b['i b X'?`YhhYfb"

8Yf'? n_U`Yg]!DUf_.'9]b'gW\ObYf'K UbXYfk Y[ž'XYf'Ub\]ghcf]gW\Yb'Fi]bYb'i bX'ZYggY`bXYb'5i gV`]W_Yb
j cfVY]ZØ\fh"

: Øf'j]Y`Y`K UbXYfYf']gh'X]Y`< YfUi gZcfXYfi b[ž'X]Y`;]dZY``XYg
HUi fi g[YV]f[Yg'ni 'Yf_`]a a Ybž'Y]b`UVgc`i hYg'<][\`][\h"
6YgcbXYfg'X]Y`6YghY][i b['XYg'\OWXghYb';]dZY`gž'XYg'A ci bh
8Ya]f_Un _ž']gh'Y]b'i bj Yf[Ygg`]WXYg'9f`YVb]g"'8]YgY
Ubgdfi WXgj c``Y'Hci f'VY`c\bh'X]Y'5VYbhYi fYf'a]h'Y]bYa
UhYa VYfUi VYbXYb'5i gV`]W_'ØVYf'XUg'[YgUa hY'; YV]f[Y'i bX'X]Y
i a `]Y[YbXYb'@UbXgWXUZhYb"</pre>

 $8 \ Ug'HUi \ fi \ g[\ YV]f[\ Y']gh'Ui \ WX'Y]b'? `YhhYfdUfUX]Yg'''6Y`]YVhY? ? `YhhYfY `K]Y'C m`Uh'i bX'MYX][`O``Yf'n]Y\Yb'? `YhhYfYf'Ui g U``Yf'K Y`h'Ub'''<]Yf'Z]bXYh'a Ub'U``Yg'j cb'Y]bZUWXYb'F ci hYb'ZØf <math display="block">5 \ bZ Ab[\ Yf'V]g'ni \ `\YfUi \ gZcfXYfbXYb'A \ Y\ fgY]``Ab[\ Yb!F ci hYb'ZØf YfZU\ fYbY'? `YhhYfYf'''8]Y'`c_U`Y'? `YhhYf[Ya Y]bgWX UZh']gh'ZfYi bX`]WX i bX'VYfY]hž']\f'K]ggYb'ni 'hY]`Yb''$

9]b'k Y]hYfYg'gdUbbYbXYg'5VYbhYi Yf'V]YhYh'XUg'
A ci bhU]bV]_]b["'8]Y'j Yfk i a a Y`hYb'DZUXY'i bX'ghY]`Yb
5VZU\fhYb']a 'HUi fi g[YV]f[Y'g]bX'Y]b'A i gg'ZØf'FUX!9bh\i g]UghYb"
8]Y'FY[]cb']gh'VY_Ubbh'ZØf']\fY'gdY_hU_i `ÀfYb'HfU]`gž'X]Y'gck c\`
ZØf'5bZÀb[Yf'U`g'Ui W\'ZØf': cfh[YgW\f]hhYbY'[YY][bYh'g]bX"
; YZØ\fhY'Hci fYb'k YfXYb'j cb'`c_U`Yb'5bV]YhYfb'Ub[YVchYbž'X]Y
XUg'bÒh][Y'9ei]da Ybh'ni f'JYfZØ[i b['ghY``Yb"

: Øf`X]Y^b][Ybž`X]Y`XYb`BYfjYb_]hnY``giW\Ybž`g]bX`>\Y\d!GUZUf]g
Y]bY`\YfjcffU[YbXY`A Ò[`]W_Y]hž`X]Y`GW\Òb\Y]h`XYg
HUi fig[YV]f[Yg`ni `Yf_i bXYb"`6Y]`X]YgYb`Hci fYb`[Y\h`Yg`Xi fW\
i bVYfØ\fhY`BUhi fž`UV[Y`Y[YbY`8 ÒfZYf`i bX`VYY]bXfi W_YbXY
GW\`i W\hYbž`X]Y`ni `cZh`ØVYfgY\YbYb`GW\ÀhnYb`XYf`HØf_Y]`ZØ\fYb"
8]Y`: U\fYf`g]bX`a Y]gh`YfZU\fYb`i bX`_YbbYb`X]Y`VYghYb`D`ÀhnYž`Ub
XYbYb`a Ub`Ub\U`hYb`i bX`: chcq`a UW\Yb`_Ubb"

5_h]j]hÀh	6YgWkfY]Vib[
K UbXYfb	9bhXYW_Yb^G]Y^YbX`cgY
	K UbXYfk Y[Y'a]h

5_h]j]hÀh	6YgWxfY]Vi b[
	UhYa VYfUi VYbXYf [.] 5i gg]W\h"	
?`YhhYfb	< YfUigZcfXYfbXY FcihYb ZØf	
	U``Y'GW\k]Yf][_Y]hg[fUXY"	
AcibhU]bV]_]b[9f`YVYb'G]Y'gdUbbYbXY'HfU]`g']b	
	Y]bYf'kibXYfgWXÒbYb	
	la[YVib["	
≯Yd!GUZUf]	9bhXYW_Yb^G]Y^UV[Y`Y[YbY	
	8 ÒfZYf'i bX'gdY_hU_i `ÀfY	
	@UbXgWXUZhYb"	

9]b'k Y]hYfYg'Ya dZY\`Ybgk YfhYg'5VYbhYi Yf']gh'XUg'7Ubmcb]b["8]Y'GW\`i W\hYb'XYg'HUi fi g[YV]f[Ygž'k]Y'X]Y'; Ò`WØ_!GW\`i W\hž V]YhYb'Y]bY'Ui ZfY[YbXY'?i`]ggY'ZØf'X]YgYb'Gdcfh"'HY]`bY\a Yf _\ObbYb'X]Y'<YfUi gZcfXYfi b[Yb'XYg'K UggYfg'i bX'@UbXYg']b j c``Yb'NØ[Yb'[Yb]Y»Ybž'k À\fYbX'g]Y'g]W\'Ub'hØf_]gV`Ui Yb'6ÀW\Yb i bX'_U`hYb'K UggYfZÀ``Yb'UVgY]`Yb"

I a 'a Y\f'ØVYf'X]Y'5_h]j]hÀhYb'i bX'FY]gYa $O[`]W_Y]hYb']a$ HUi fi g[YV]f[Y'ni 'YfZU\fYbž'VYgi W\Yb'G]Y'X]Y'c ZZ]n]Y``Y'K YVg]hY XYf'HØf_Y]"'8 cfh'Z]bXYb'G]Y'nU\`fY]W\Y'DZcfa Uh]cbYb'i bX U_hi Y``Y'5b[YVchYž'X]Y'DAfY'FY]gYd`Ubi b['Yf`Y]W\hYfb'k YfXYb"

8]Y'ZUgn]b]YfYbXY'?i`hif'ibX'HfUX]h]cbYb XYf'HØf_Y]

8]Y'HØf_Y]']gh'Y]b'Y]bn][Ufh][Yg'@UbXž'XUg'6fØW_Yb'nk]gWXYb'Cgh i bX'K Ygh'gW\'À[h"'=\fY'?i `hi f']gh'Y]b'Vi bhYg'Ni gUa a Ybgd]Y`'Ui g j]Y`ZÀ`h][Yb'HfUX]h]cbYbž'<]ghcf]Y'i bX'nY]h[YbÒgg]gWXYb 9]bZØggYb"'6Ygi WXYf'_ÒbbYb']b'X]YgYa '@UbX'Y]b'fY]WX\U`h][Yg 9fVY'YbhXYW_Ybž'XUg'j cb'XYf'Chhca Ub]gWXYb'9a d]fYž'XYa 6mnUbh]b]gWXYb'FY]WX'V]g'\]b'ni ']bX][YbYb'GhÀa a Yb'i bX

9]b 'nYbhfU`Yf'5gdY_h'XYf'hØf_]gWXYb'?i `hi f'g]bX'X]Y'HfUX]h]cbYbž X]Y'c Zh'j cb'fY[]cbU`Yb'; Y[YVYb\Y]hYb'UV\Àb[Yb"'8]Y i bhYfgWX]YX`]WXYb'6Yj Ò`_Yfi b[g[fi ddYb'i bX'Yh\b]gWXYb A]gWXi b[Yb'XYf'HØf_Y]'gWXUZZYb'Y]bY'J]Y`ZU`hž'X]Y'g]WX']b': YghYbž 6fÀi WXYb'i bX'U``hÀ[`]WXYb'F]hi U`Yb'k]XYfgd]Y[Y`h'': c`_`cfYž Aig]_'i bX'HUbn'gd]Y`Yb'XUVY]'Y]bY'VYXYi hYbXY'Fc``Y'i bX'g]bX b]WXh'bi f'Y]bY': cfa 'XYf'I bhYf\U`hi b[ž'gcbXYfb'Ui WX'Y]b 5i qXfi \underline{W} 'XYf'=\XYbh]h\h'ni bX'; Ya Y]bqWXUZh''

- : c`_`cfY.'8]Y'hØf_]gW\Y': c`_`cfY']gh'fY]W\'Ub
 9fnÀ\`i b[Ybž'X]Y'j cb'; YbYfUh]cb'ni'; YbYfUh]cb
 k Y]hYf[Y[YVYb'k YfXYb"'A mh\Ybž'@Y[YbXYb'i bX'A ÀfW\Ybg]bX'h]YZ']b'XYf'?i `hi f'j Yfk i fnY`h"
- ? i bgh'i bX' < UbXk Yf_. '8]Y'HØf_Y]']gh'VYfØ\a h'ZØf']\fY ? i bghk Yf_Y'k]Y'HYdd]W\Yž'?YfUa]_Yb'i bX'8Ua UgnYbYf GhU\`"'8]YgY' < UbXk Yf_g_ØbghY'g]bX'cZh'fY[]cbU`Y GdYn]U`]hÀhYbž'X]Y'; YgW\]W\hYb'i bX'HfUX]h]cbYb'gd]Y[Y`b"
- A i g]_i b X 'HUbn. '8]Y 'A i g]_gnYbY ']b 'XYf'HØf_Y]'fY]W h
 j cb 'hfUX]h]cbY``Yf'J c`_ghÀbnYb'V]g'\]b 'ni 'a cXYfbYf
 Dcda i g]_"'=bghfi a YbhY'k]Y 'X]Y '6Uû`Ua U'i bX'X]Y 'bYm'g]bX
 hmd]gWXY'JYfhfYhYf'XYf'hØf_]gWXYb'A i g]_"

8]Y 'hØf_]gW\Y'? ØW\Y']gh'Y]b'k Y]hYfYg'GW\`ØggY`Y`Ya Ybh'XYf
_i `hi fY``Yb'=XYbh]hÀh''G]Y']gh'b]W\h'bi f'Y]b'; Ybi ggž'gcbXYfb'Ui W\
Y]bY'5i gXfi W_gZcfa 'XYf'?i `hi fž'X]Y'9]bZ'ØggY'Ui g'5g]Ybž'XYa
BU\Yb'CghYb'i bX'XYa 'A]hhY`a YYffUi a ']bhY[f]Yfh''; Yf]W\hY'k]Y
?YVUVŽ'A YnYž'D]XY'i bX'6U_`Uj U'g]bX']bhYfbUh]cbU``VY_Ubbh'i bX
k YfXYb'a]h'j]Y`'@]YVY'i bX'<]b[UVY'ni VYfY]hYh''5b
9ggYbg[Yk c\b\Y]hYb'_Ubb'Ui W\'X]Y'; UghZfYi bXgW\UZh'XYf'HØf_Yb
Yf_Ubbh'k YfXYb/cZh'k]fX'XUg'9ggYb'U`g'gcn]U`Yf'H]gW\'dfÀgYbh]Yfhž
Ub'XYa 'a Ub'[Ya Y]bqUa 'qdY]gh'i bX'q]W\'Ui qhUi qW\h''

9]b'k]Wkh][Yf'6YghUbXhY]`XYf'?i `hi f'g]bX'Ui Wk'X]Y': YghY''8]Y HØf_Yb'ZY]Yfb'nU\`fY]WkY': Y]YfhU[Yž'X]Y'cZh'fY`][]ÒgY'cXYf gU]gcbU`Y'6YXYi hi b['\UVYb''8]YgY': YghY'Vf]b[Yb'A YbgWkYb ni gUa a Yb'i bX'ghÀf_Yb'X]Y'; Ya Y]bgWkUZh''<]Yf'g]bX'Y]b][Y'XYf

: Ygh	8 Uhi a	6YgWkfY]Vib[
BYi U\f'fM`VU Ł	%"`*Jbi Uf	8UgʻbYi YʻIJ\f'k]fX
		a]h∵Y]Yfbž
		ZYgh`]W\Yb
		5VYbXYggYb i bX
		: Yi Yfk Yf_'VY[fػh"
FUa UnUb 6UmfUa	J Uf]UVY``fbUW	8 Ugʻ: YghʻXYg
	∍g`Ua]gW\Ya	: UghYbVfYWXYbgž
	?U`YbXYfŁ	[YdfÀ[hˈjcb
		: Ua]`]YbVYgi WXYb
		i bX [*] [fc»Ya
		: Ygha U\`"
?ifVUb~6UmfUa	J Uf]UVY``fbUW\	8 UgʻC d ZY f ZY ghžʻX Ug
	∍g`Ua]gW\Ya	X]Y'CdZYf[YgWX]WXhY
	?U`YbXYfŁ	5VfU\Ua gʻZY]Yfhžʻa]h
		XYf`HfUX]h]cb`XYf
		H]YfcdZYf"
BUh]cbU`ZY]YfhU[&' "'5df]`	9]b:Y]YfhU[ini
		9\fYb [·] XYg
		HØf_]gW\Yb
		BUh]cbU`dUf`Ua Ybhgž
		a]hˈDUfUXYbˈi bX
		JYfUbghU`hib[Yb"

9]b'k Y]hYfYf'VYXYi hYbXYf'_i `hi fY``Yf'5gdY_h']gh'X]Y
: Ua]`]Ybghfi _hi f"' \(\text{\t

5dfcdcg'HfUX]h]cbYb.'8]Y'<cW.nY]hgf]hi U`Y']b'XYf'HØf_Y]'g]bX ZUgn]b]YfYbX'i bX'j Uf]]YfYb'ghUf_'nk]gWXYb'XYb'FY[]cbYb"'Jcb Y]bYa 'ZYgh`]WXYb'<YbbU!5VYbX'V]g'\]b'ni f'Y][Ybh`]WXYb'HfUi i b[[]Vh'Yg'nU\`fY]WXY'_i `hi fY``Y'6fÀi WXYž'X]Y'YXY'<cW.nY]h'ni 'Y]bYa Y]ba U`][Yb'9f`YVb]g'a UW\Yb"'8]Y'6fUi h_`Y]XYf'g]bX'cZh'Vi bh'i bX Ui Zk YbX][ž'k À\fYbX'X]Y'<cW\nY]hgZY]Yfb'cZh'a Y\fYfY'HU[Y XUi Yfb"

8]Y'hØf_]gW\Y'?i`hif']gh'gW\`]Y»`]W\'UiW\'Yb['a]h'XYf'FY`][]cb
j YfVibXYbž'kcVY]'XYf'=g`Ua'X]Y'Xca]b]YfYbXY'FY`][]cb']gh"'8]Y
fY`][]ÒgYb'DfU_h]_Yb'ibX':Y]YfhU[Y'gd]Y`Yb'Y]bY'kYgYbh`]W\Y'Fc``Y
]a'_i`hifY``Yb'@YVYb"'AcgW\YYb'g]bX'b]W\h'bif'CfhY'XYf
5bVYhib[ž'gcbXYfb'UiW\'NYbhfYb'XYg';YaY]bgW\UZhg`YVYbgž'kc
6]`Xib[ž'gcn]U`Y'IbhYfghØhnib['ibX'NigUaaYb_ØbZhY
ghUhhZ]bXYb"

±b 'XYf'HØf_Y]'hfYZZYb'J Yf[Ub[Yb\Y]h'i bX'; Y[Ybk Ufh'Ui ZY]bUbXYf i bX'gW\UZZYb'gc'Y]bYb'ZUgn]b]YfYbXYb'_i `hi fY``Yb'F Ui a "'¾XYf 6Ygi W\'V]YhYh'bYi Y'A Ò[`]W_Y]hYbž']b'X]YgY'fY]W\Y'?i `hi f Y]bni hUi W\Ybž'gY]'Yg'Xi fW\'XUg'9f_i bXYb'\]ghcf]gW\Yf'GhÀhhYbž XYb'; Ybi gg'hfUX]h]cbY``Yf'HUbnUi ZZØ\fi b[Yb'cXYf'XUg'9bhXYW_Yb_i`]bUf]gW\Yf'?Ògh`]W_Y]hYb"'9g']gh'Y]b'@UbXž'XUg'; YgW\]W\hYb'ni YfnÀ\`Yb'\Uh'i bX'XYb'6Ygi W\Yfb'j]Y`Y'i bj Yf[Ygg`]W\Y'9]bXfØW_Y V]YhYh"

I bj Yf[Ygg`]W\ Y '9f`YVb]ggY]b 'XYb 7UddUXcW]U '6U``cbZU\ fhYb

7 UddUXcW]Uža]hi]\fyb'Y]bn][Ufh][Yb': Y`gZcfa Uh]cbYb'i bX'XYa HfUi a `UbX'Ui g': YYb_Ua]bYbž']gh'b]W\h'bi f'Y]b'Cfh'ZØf; YgW\]W\hg`]YV\UVYf'i bX'K UbXYfYfž'gcbXYfb'Ui W\'ZØf 5VYbhYi Yf`i gh][Yž'X]Y'Y]b'i bj Yf[Ygg`]W\Yg'9f`YVb]g'gi W\Yb''`6U``cbZU\fhYb'ØVYf'X]YgY'VYY]bXfi W_YbXY'@UbXgW\UZh'n]Y\Yb'\A\f`]W\'hUi gYbXY'j cb'Hci f]ghYb'Ub'i bX'[Y\ÒfYb'ni 'XYb Ui ZfY[YbXghYb'5_h]j]hÀhYbž'X]Y'a Ub']b'XYf'HØf_Y]'i bhYfbY\a Yb_Ub'"

8]Y 'J cfghY``i b[ž'gUbZh'Xi fW\ 'X]Y '@\ZhY'ni '[`Y]hYb'i bX'XUVY]'Y]bY UhYa VYfUi VYbXY'5i gg]W\h'Ui Z'XUg'i bbUW\U\a `]W\Y @UbXgW\UZhgV]'X'7UddUXcW]Ybg'ni '[Yb]Y» Ybž'`Àggh'XUg' < Yfn'\Ò\Yf gW\`U[Yb"'\XXYf': `i ['VY[]bbh']b'XYb'Zf\O\Yb'A cf[Ybghi bXYbž k cVY]'X]Y'DUggU[]YfY'cZh'[Y[Yb'(. \$\$`I \f'[Yk YW_h'k YfXYbž'i a

fYWkhnY]h]['ni a 'GhUfhd`Uhn'ni '[Y`Ub[Yb"'8cfh'k]fX'XYf'6U``cb j cfVYfY]hYhž'i bX'k À\fYbX'X]Y'YfghYb'GcbbYbghfU\`Yb'XUg'HU` VY`Yi WkhYbž'_ÒbbYb'X]Y'DUggU[]YfY'X]Y'`YV\UZhYb': UfVYb VYcVUWkhYbž'X]Y'XYb'<]a a Y``Yf\Y``Yb"

9]b hmd]gW\Yfr6U``cbZi [']b '7 UddUXcW]U 'XUi Yfh'Yhk U '* \$ 'A]bi hYb i bX 'VYhfÀ[h'cZh'nk]gW\Yb'('i bX'%&'_a ']b 'XYf'< Ò\Yž'UV\Àb[][j cb 'XYb'K YhhYfVYX]b[i b[Yb"'8]Y': `i [[YgY``gW\UZhYbž'X]Y'X]YgYb GYfj]WY'UbV]YhYbž'g]bX 'YfZU\fYb'i bX'[i h'Ui g[YV]`XYh"'G]Y _Øa a Yfb'g]W\ i a 'U``Y'G]W\Yf\Y]hga U» bU\a Yb'i bX'V]YhYb'a Y]gh Ui W\'Y]bY'i a ZUggYbXY'9]bk Y]gi b['j cf'XYa 'GhUfh'Ub''

K Ufi a 'Y]bY'6U``cbZU\fh']b'7UddUXcW]U3

8]Y'5bhk cfh'Ui Z'X]YgY': fU[Y']gh'Y]bZUWX.'7UddUXcW]U'V]YhYh'a]h]\fYa 'Y]bn][Ufh][Yb'; YcdUf_'Y]bY'@UbXgWXUZhž'X]Y'a UbUa 'VYghYb'Ui g'XYf'@i Zh'VYhfUWXhYh''<]Yf'g]bX'Y]b][Y'; fØbXYžk Ufi a 'Xi 'i bVYX]b[h'Y]bY'6U``cbZU\fh']b'XY]b'FY]gYdfc[fUa a Ui ZbY\a Yb'gc``hYgh

- 5 hYa VYfUi VYbXY '5 i gg]W hYb. '8 Yf '6`]W_'Ui Z'X]Y k Y]W Yb' < Ø[Y'ž'X]Y']b'XYf'A cf[YbXÀa a Yfi b[''Yi W hYbž]gh'Y]bZUW 'i bj Yf[Ygg`]W "
- D\chca Ò[`]WX_Y]hYb. '8]YgY '@UbXgWX UZh']gh'Y]b 'HfUi a ZØf': chc[fUZYb'i bX'UVYbhYi Yf`]WXY '±bghU[fUa a Yf"'8]Y dYfZY_hY'; Y`Y[Yb\Y]hž'i a 'Y]bn][Ufh][Y'5i ZbU\a Yb'ni a UWXYb"
- 9]bV`]W_Y`]b'X]Y``c_U`Y'?i `hi f. `J]Y`Y`6U``cbZU\fYf
 hY]`Yb'; YgWX]WX hYb'ØVYf'X]Y`FY[]cbž']\fY'; YgWX]WX hY'i bX
 ; Yc`c[]Yž'k À\fYbX'g]Y'X]Y'DUggU[]YfY'Xi fWX'X]Y'@ØZhY
 _i hgWX]YfYb"
- 9]b'; YZØ\`XYf': fY]\Y]h.'GW\kYVYbX'Xi fW\'X]Y'@ØZhY Yf`YVgh'Xi 'Y]b'i bj Yf[`Y]W\`]W\Yg'; YZØ\`XYf': fY]\Y]h"

$8]YVYghYbNY]hYbZØfY]bY6U``cbZU\fh$

8]Y'<Ui dhgU]gcb'ZØf'6U``cbZU\fhYb']b'7UddUXcW]U']gh'j cb'5df]` V]g'Bcj Ya VYf"'Ni 'X]YgYf'NY]h'g]bX'X]Y'K YhhYfVYX]b[i b[Yb

cdh]a U`ži bX'X]Y'7\UbW'b'ZØfY]bYb'[Y`i b[YbYb': `i ['g]bX'\cW\"9g'[]Vh'YXcW\'Ui W\'K]bhYfZØ[YŽX]Y'Y]bY'[Ubn'UbXYfY
DYfgdY_h]j Y'V]YhYbž'k À\fYbX'Y]b'gUbZhYf'GW\bYY'X]Y': Y`gYb
VYXYW_h"'8YbbcW\'a i gg'a Ub'XUZØf'Ui Z'[YY][bYhY
K YhhYfj Yf\À`hb]ggY'UW\hYbž'XU'G]W\Yf\Y]h'\]Yf'Ub'cVYfghYf'GhY``Y

6Y] XYf 6i Wi b[Y]bYf 6U ``cbZU\fh"[]Vh'Yg'a Y\fYfY'I bhYfbY\a Yb ni f'5i gk U\ `ž'i bX'X]Y'DfY]gY'_ \dot{O} bbYb''Y'bUW\ GU]gcb'i bX'5bV]YhYf j Uf]]YfYb"'; YbYfY```]Y[h'XYf'DfY]g'ZØf'Y]bY'GhUbXUfX!6U``cbZU\fh nk]gW\Yb'%) \$'i bX'' \$\$'9i fc'dfc'DYfgcb"'9g'`c\bh'g]W\ž']a J cfUi g'ni 'Vi W\Ybž'XU'X]Y'D'ÀhnY'gW\bY``'Ui g[YVi W\h'g]bXž'j cf U``Ya ']b'XYf' < cW\qU]qcb"

K Ug a Ub j cf Y]bYf 6U``cbZU\fh k]ggYb gc``hY

6Yj cf'Xi ']b'XY]bYb'?cfV'ghY][ghž'[]Vh'Yg'Y]b'dUUf'8]b[Yž'X]Y'Xi k]ggYb'gc``hYgh

- : fØ\ghØW_. 'C Zhig]bXiX]Yi6U``cbZU\fh!5bV]YhYfigcibYhhž XYbiDUggU[]YfYbiY]bi`Y]WXhYgi: fØ\ghØW_iUbniV]YhYbž VYj cfiXYfi: `i [ighUfhYh"iDfcZ]h]YfYij cbiX]YgYfi; Y`Y[Yb\Y]hž i a igbYf[]Yini ihUb_Yb°
- ; Ygi bX\Y]hgni ghUbX. K Ybb Xi 'i bhYf' < Ò\YbUb[gh 'Y]XYgh cXYf'[Ygi bX\Y]h`]W\Y DfcV`Ya Y '\Ughž']gh Yg fUhgUa ž'X[Yg']a 'J cfZY`X a]h XYa '5bV]YhYf ni 'VYgdfYW\Yb"

8]Y @UbXib[

8]Y @UbXi b['_Ubb'a UbW\a U``Y]b'k Yb]['\c`df]['gY]bž'UVYf'X]Y
D]`chYb'g]bX'gY\f'YfZU\fYb'i bX'k]ggYbž'k]Y'g]Y'g]W\Yf'`UbXYb
\ObbYb'''\delta'j]Y`Yb': \A``Yb'k]fX'bUW\'XYf'@UbXi b['Y]bY'\Y]bY': Y]Yf
a]h'Y]bYa '; `Ug'GY_h'i bX'Y]bYf'I f_i bXY'j YfUbghU`hYh''8]Yg'a UW\h
XUg'9f`YVb]g'bcW\'ZYgh`]W\Yf'i bX']gh'Y]bY'[fc\strum Ufh][Y'A O[`]W_Y]hž

$9a dZc \ YbY 5bV]YhYf$

 $<]Yf^{\cdot}]gh^{\cdot}Y]bY^{\cdot}_Y^{\cdot}]bY^{\cdot}_VYfg]W\lambda h^{\cdot}j \ cb^{\cdot}fYbca \ a \]YfhYb^{\cdot}5bV]YhYfb^{\cdot}Z0f \ 6U^{\cdot}CbZU\lambda fhYb^{\cdot}]b^{\cdot}7UddUXcW]U.$

5bV]YhYf	DfY]ggdUbbY	6YgcbXYf\Y]hYb
6i hhYfZm~6U``ccbg	&\$\$!&) \$ [*]	@ l i f]ÒgY 6U``cbgž
		_`Y]bY'; fi ddYb
FcmU`6U`ccb	&) \$!' \$\$"	9fZU\fYbYf^D]`chž^7\U
		a dU[bY!NYfYa cb]Y
7UddUXcW]U'JcmU[Yf	%) \$!&\$\$`	K YhhVYk YfVgZÀ\][Y
6U``ccbg		DfY]gYž'[i hY
		G]WXYf\Y]hgghUbXUfX
		g

7 UddUXcW]U'Yf\YVh'XYb'5bgdfi W\ž'Y]bY'XYf'VYghYb'CfhY'k Y`hk Y]h ZØf'6U``cbZU\fhYb'ni 'gY]bž'i bX'XUg'Ui g'[i hYa '; fi bX"'9g']gh'b]W\h bi f'Y]b': `i [/'Yg']gh'Y]b'i bj Yf[Ygg`]W\Yg'9f`YVb]gž'XUg'X]W\'a]h'XYf GW\Ob\Y]h'i bX'XYf'A U[]Y'XYf'B Uhi f'j YfV]bXYh''K Ybb'Xi 'XY]b 5VYbhYi Yf']b'XYf'HØf_Y]'d`Ubghž'd`UbY'i bVYX]b[h'Y]bY'6U``cbZU\fh]b'7UddUXcW]U'Y]bž'i a 'Y]b'GhØW_X]YgYg'DUfUX]YgYg'Ui g'XYf'@ Zh ni 'Yf`YVYb'

8 Y hU]`c

6Ygi WXYb G]Y i bg Ui Z Y]bY!fY]gY "XY