

# GhcbYm'7fYY\_': U``g'7U]fbg' 'K UggYfZU`` i bX'GWk]a a `cWk

GhcbYm'7fYY\_': U``g'7U]fbg']gh'Y]b'VY`]YVhYf'K UggYfZU``k UbXYfk Y[i bX'Y]b'6UXY`cW\`z'XUg'j ca 'nYbhfU`Yb'; YgW\`AZhgj ]YfhY`'j cb 7U]fbg'Ui g'`Y]W\`h'ni 'YffY]W\Yb']gh''6Ygi W\Yf'\UVYb'X]Y A Ò[`]W\\_Y]hz'Y]bYb'\_i fnYb'a U`Yf]gW\Yb'GdUn]Yf[Ub['ni 'XYb'C`X K Y]f': U``g'ni 'a UW\Yb'cXYf'Y]b'YfZf]gW\YbXYg'6UX']a GW\k ]a a `cW\']b'XYf'B\`A\Y'XYg'DUf\_d`UhnYg'ni 'bY\a Yb''

Gi WXYb'G]Y'bUWX'Y]bYa 'gWXbY``Ybž'YfZf]gWXYbXYb'GØ» k UggYf!
6UXYd`Uhnž'i a 'XYf'<]hnY'j cb'7U]fbg'ni 'hfchnYb3'→W'\UVY'X]WX
UV[YXYW\_h"'GhcbYm'7fYY\_': U``g'7U]fbg']gh'Y]bYf'XYf
bÀWXgh[Y`Y[YbYb'6UXYcfhY']b'7U]fbg'i bX'Y]bYf'XYf'Ua
Y]bZUWXghYb'ni 'YffY]WXYbXYb"

9[U`žcV`G]Y`Y]b`\_i fnYg`6UX`bY\a Yb`cXYf`Y]bY`\_i fnY`K UbXYfi b[ni `XYb`C`X`K Y]f`: U``g`i bhYfbY\a Yb`a ÒW\hYbž'GhcbYm`7fYY\_`]gh Y]b`\Yfj cffU[YbXYg`BUhi fn]Y``]b`XYf`BÀ\Y`j cb`7U]fbg"

"U'M1 GHCB9M7F99?":  $5@G'75 \neq BG\check{z}'C@8'K9 \neq ": 5@G'K5GG9F: 5@G'IB8'G7 < K <math>\Rightarrow$  A @C7 < 2 U'M1 GHCB9M7F99?" K 5B89FK9;  $9" \Rightarrow "89F'B" < 9" JCB75 \neq BG$  2 U'M1 GHCB9M7F99?":  $5@G'75 \neq BG\check{z}'C@8'K9 \neq ": 5@G'G7 < K \Rightarrow$  A @C7 < 2

# $GhcbYm^{2}7fYY_{:}U^{g}7U]fbg^{g}kc^{g}gh^{2}XUg3^{g}$

GhcbYm'7fYY\_']gh'ØVYf'Y]bY'\_i fnYž'&\$!a ]bØh][Y': U\fh'j cb'7U]fbg 768'ØVYf'X]Y'K YghYfb'5fhYf]U'`FcUX'ni 'YffY]W\Yb"'G]Y'a ØggYb Ui Z'X]Y'GhcbYm'7fYY\_'FcUX'fi? Ua Yfi b[UŁ'UVV]Y[Ybž'X]Y'Xi fW\XYb'FY[Ybk U'X'ni a 'DUf\_d`Uhn'ZØ\fh"

Jcb^\]Yf'Ui g']gh'XYf'K Y['Ui Z'XYf'fYWkhYb'GY]hY'[i h'g]WkhVUf'i bX ZØ\fh'gcZcfh'Ui Z'Y]bY': i » [Àb[YfVfØW\_Y'Ui g'6Yhcbž'k c'G]Y'ni a bU\Y'[Y'Y[YbYb'GWk]a a `cWk'UVnkY][Yb'cXYf'Ui Z'XYa 'GhcbYm 7fYY\_!K UbXYfkY['ni 'XYb'C `X'KY]f': U``g'kY]hYf[Y\Yb'\_ObbYb"

KigghYb'G]YžXUgg'XYf'DUf\_d`Uhn'GhcbYm'7fYY\_'XYf 5ig[Ub[gdib\_h'ZØf'XYb'5igg]WXhgdZUX'; `UW]Yf'FcW\_']gh'ibX'bif %) '5ihca]bihYb'jcb'XYb': U]fm': U``g'ibX'XYb'7fmghU`'7UgWUXYg YbhZYfbh']gh3

 $\texttt{J9FK 5B8H9.`K $\pm 8: ?'@@9'p' < 5FH@9MG'7F99?': ?'@@H}$ 

#### GhcbYm7fYY\_K UggYfZU``ibXGWk]aa`cWk

GhcbYm7fYY\_'GWklaa`cW\'

8 UgʻHc``YʻUbʻGhcbYmʻ7fYY\_:: U``gʻ7U]fbgʻ]ghž'XUggʻYgʻbi fʻk Yb][YA]bi hYbʻj ca ʻDUf\_d`UhnʻYbhZYfbhʻY]bʻh]YZYgʻGW\k |a a `cW\'[]Vh"

la`\]Yf\Yf`ni`[Y`Ub[Ybž'ØVYfeiYfYb`G]Y`X]Y`VYhcb]YfhY

: i » [  $\dot{a}$ b[ YfVfØW\_Y i bX bY\a Yb G]Y i ba ]hhY `VUf XUbUW\ `Ub `XYf ; UVY`i b[ `XYb ``]b\_Yb `K Y[ "'5`hYfbUh]j '\_ $\dot{o}$ bbYb `G]Y `Ui W\ i bhYf `XYf 6fØW\_Y `Xi fW\ei YfYb i bX `XYa 'gY]W\hYb `6UW\ `WU"' 'A ]bi hYb `V]g ni f`K UggYfghY``Y `Zc`[ Yb" U`h1 GHC B 9M7F 99? `G7 < K  $\Rightarrow$  A @C 7 < 2 8 Ug `GW\k ]a a `c \W\ ]gh'VfY]hi bX `Ub `XYf'h]Y ZghYb `GhY``Y `Yhk U`& A YhYf'h]Y Z'

CVk c\``X]Yg'Y]b'[fc» Ufh][Yf'C fh'ni a 'GW\k ]a a Yb'i bX'5V\_ $\emptyset$ \`Yb]ghž'\_Ubb'Yg']a 'Gca a Yfž'VYgcbXYfg'Ua 'K cW\YbYbXYž'gY\f'j c`` k YfXYb"'9fk À[Yb'G]Y'Y]bYb'Zf $\emptyset$ \Yb'6Ygi W\'cXYf'Ub K cW\YbhU[Ybž'i a 'X]Y'A YbgW\Yba UggYb'ni 'j Yfa Y]XYb" U`h1 GHCB9M7F99?'GK  $\Rightarrow$  A  $\Rightarrow$  '< C @9'75  $\neq$  BG 2

# 8 Yf GhcbYm 7 fYY\_ K UbXYfk Y[ 'ni 'XYb 'C `X 'K Y]f : U``g'

K Ybb 'XUg'GW\k ]a a `cW\'ØVYfZØ``h']gh'cXYf'G]Y'Y]bY'\_i fnY K UbXYfi b[ 'ni 'Y]bYa '[ fÒ» YfYbž'UV[ Y`Y[ YbYfYb 'K UggYfZU`` VYj cfni [ Ybž'bY\a Yb'G]Y 'XYb 'K UbXYfk Y[ 'ni 'XYb'C `X'K Y]f': U``g'' 8]YgYb 'YffY]W\Yb 'G]Yž']bXYa 'G]Y 'XYb'[ YfUXYb 'K Y[ 'j cb 'XYf '; UVY`i b[ 'XYf': i » [ Åb[ YfVfØW\_Y 'bY\a Ybž'XYf'Y]bYb 'VfY]hYbž i bVYZYgh][ hYb 'K Y[ '\]bUi ZZØ\fh'' U`h1 GHC B 9M7 F 99? ': 5@@G'K 5B89FK 9; '75  $\neq$  BG 2 8]YgYf'K Y[ ']gh'XYf'GhcbYm'7fYY\_'K U`\_]b[ 'HfUW\_ž'XYf'bUW\'Yhk U &\$'A ]bi hYb'X]Y'C `X'K Y]f': U``g'YffY]W\h''8]YgYf'K Y[ 'Zc`[ h'XYa 6UW\'X]Y'GY]hY'Y]bYg'UV[ Yfi bXYhYb'< Ø[ Y`g'\]bUi Z'i bX'YbXYh X]fY\_hØVYf'XYa 'K UggYfZU``'

9g'[]Vh'Y]bYb'[fc»Yb'i a [YghØfnhYb'6Ui a ž'XYf'X]fY\_h'ØVYf'XYa K UggYfZU``'fi \h'i bX']\b'gW\Òb'i a fU\a h"8Yf'C`X'K Y]f!K UggYfZU`` gY`Vgh'ghØfnh'Yhk U', 'A YhYf'ØVYf'Y]bY': Y`gk UbX'\]bUV'Ui Z'Y]b gUbX[YgÀi a hYg'l ZYf" U`h1 5@H9'K 9 < F: Y @@9'69=GHCB9M7F99? ž'75=BG 2 C`X'K Y]f : U``g

CVkc\``XUg`K UggYf`\]Yf'b]W\h`gc`h]YZ']ghž']gh'Yg`]a a Yf'bcW\`Y]b [fc»Ufh][Yf'Cfhži a 'q]W\`UVni Ø\`Yb'i bX'X]Y'Fi\Y'ni '[Yb]Y»Yb" 9g'[]Vh'Ui W\'Y]b'h]YZYfYg'GW\k]a a `cW\'X]fY\_h'ØVYf'C`X'K Y]f'i bX Y]b'dUUf'k Y]hYfY'GhY``Yb $\check{z}$ X]Y'Ybh`Ub['XYf'GhfY $W_Y$ 'j YfghfYi h'g]bX" U`h1 GHCB9M7F99?':  $\check{y}$ @H'75 $\neq$ BG 2

# $7U]fbg'IbhYf_ibZhgZ\emptyset\fYf''Kc''\emptysetVYfbUWhYb$

D`UbYb`G]Y`Y]bY`FY]gY`bUW\`7U]fbg`i bX`ZfU[Yb`g]W\ž`k c`G]Y`g]W\b]YXYf`UggYb`gc``Yb3`I bhYb`\UVY`]W\`Y]b][Y`XYf`VYghYb`Cdh]cbYb]b`XYf`BÀ\Y`j cb`7U]fbg`9gd`UbUXY`Ui Z[Y`]ghYh"`=W\`\UVY`Ui W\Y]bYb`i a ZUggYbXYb`I bhYf\_i bZhgZØ\fYf`ZØf`7U]fbg`gck]Y`Y]bYbi a ZUggYbXYb`I bhYf\_i bZhgZØ\fYf`ZØf`Dcfh`8ci[`Ug`[YgW\f]YVYb"

7fmghU`Vfcc\_'F]`Ym' 'K Ybb'G]Y'bUW\'@'lig'ibX'@U[Y'giW\Ybž']gh XUg'7fmghU`fVcc\_'F]`Ym'ibgW\`U[VUf"'8]Yg']gh'XUg'VYghY')!GhYfbY! FYgcfh']b'7U]fbg'ibX'V]YhYh'UVgc`ih'U``Ygž'kUg'G]Y'jcb'Y]bYa 7fmghU`Vfcc\_!FYgcfh'YfkUfhYb"

H]dd.; Y\Yb'G]Y'Ui Z'YXYb': U```ni 'FcWWc g'6Uf'Ui Z'XYf'Gd]hnY'XYg 7fmghU`Vfcc\_'F]`Ymž'i a 'Y]bYb'[fc»Ufh][Yb'6`]W\_'ØVYf'7U]fbg'ni [Yb]Y»Yb°

U`h1 A ÀXWXYb`VY]a `GcbbYbVUXYb`]a `7fmghU`Vfcc\_`F]`Ym`FYgcfh]b`7U]fbg 2

U`h1 FM8; 9G`9GD@5B589`F9GCFH`\B`75\FBGž'K C`| BH9F?| B: H NI '6@9\69B 2

: ]hnfcm=g`UbX:FYgcfh: K Ybb:G]Y:`]YVYf:Ui Z:Y]bYf:XYf:a U`Yf]gWXYb =bgY`b:XYg; fYUh:6Uff]Yf:FYYZ:ØVYfbUWXhYb:a ÒWXhYbž:g]bX:G]Y:]a : ]hnfcm=g`UbX:FYgcfh:[YbUi:f]WXh][":K À\fYbX:G]Y:\]Yf:Y]bYb HU[YgUi gZi [ 'i bhYfbY\a Yb:\_ObbYbž:Ya dZY\`Y']WX:Xf]b[YbXž:X]Y BUWXh:ni 'j YfVf]b[Ybž:XUa ]h:G]Y:a Y\f:NY]h:\UVYbž:XUg:F]ZZž:X]Y ?cfU``YbghfÀbXY:i bX:X]Y:K UbXYfk Y[Y:]a 'FY[Ybk U`X:ni Yf\_i bXYb"

U'h1 :  $\pm$ NFCM $\pm$ @5B8'F9GCFH 2

; ]``][ Ub g'6UW\_dUW\_Yfg' '8]Y'VYghY'6UW\_dUW\_Yf!Cdh]cb'ZØf'Y]bY hc``Y'5ha cgd\ÀfY']b'7U]fbg']gh; ]``][ Ub g'6UW\_dUW\_Yfg"'8Ug'`]Y[ h XUfUbž'XUgg'X]YgYg'Y]bYb'Gk ]a a ]b[ dcc`ž'Y]bY'?`]a UUb`U[ Yž'Y]bY \_ca d`YhhY'?ØW\Y'i bX'Y]bYb'[ fc»Ufh][ Yb'; Ya Y]bgW\UZhgVYfY]W\\Uhži a 'UbXYfY'FY]gYbXY'ni 'hfYZZYb"

'U'h1 ; =@= 5BG'657?D57?9F'F9GCFH 2

### $A Y \setminus f \cdot 7U = fbg \cdot K UggY fZU \cdot Z\emptyset \setminus fY f$

K Y]hYfY'\_cghYb`cgY'K UggYfZU``ZØ\fYf']b'7U]fbg'Z]bXYb'G]Y']b'XYf Zc`[ YbXYb'@]ghY"'=\W.'Ya dZY\`Yž'X]YgYb'7U]fbg'K UggYfZU``ZØ\fYf cXYf'X]YgYb'7U]fbg'K UbXYfZØ\fYf'ni '`YgYbž'XUa ]h'G]Y'a Y\f K UggYfZÀ``Y'i bX'BUhi fdZUXY']b'XYf'BÀ\Y'j cb'7U]fbg'Z]bXYb"

6i W. '9d]WK]`X`]ZYžFU]bZcfYghžK UhYfZU``'Hf]d'Zfca '7U]fbg

"U`M GHCB9M7F99? "GK  $\Rightarrow$  A  $\Rightarrow$ ; "< C@9"  $\Rightarrow$  "89F" B\" < 9" J CB 75  $\neq$  BG 2

#### A 9=B 9 ? 5 A 9F 5 I B 8 : C H C 5 I G F G H B;

- Gd]Y[Y``cgY'?Ua YfU.'7Ubcb'F)
- 8 fc \ bY. 8 = A Uj ]WDfc &
- ' \* \$!; fUX!5Wh]cb!?Ua YfU. '=bghU' \* \$ 'CbY'L &
- @UbXgWXUZhgcVY\_h]j . 7 Ubcb F: "%)!') a a 'Z#&", @
- 5``fci bX!CVY\_h]j . '7Ubcb'F: '&( %\$) 'a a 'Z#(@
- $HY Y C V Y_h]j . 7 Ub C b F : '%$$ ) $$ a a Z II II ( ž) + Z % @$
- $\bullet @ Ub [ Y 5_h] c b g g h Ub [ Y 4 b g h U' * $ b j ] g] V Y Dc Y f b i Y h H] a Y k \\$
- $\bullet @ Ub Xg W U Zhg`]bg YbZ]`h Yf.` < c m U`7]f W``Uf`Dc`Uf]n Yf$
- ?Ua YfUfi W\_gUW\_. :: !Ghcd H]`cdU
- $\bullet @] YV`]b[ gZchcni VY\Of. `DYU\_`8Yg][ b`7Udhi fY`7`]d \\$

9]bY'@]ghY'a Y]bYf'Ya dZc\`YbYb': chcUi gfØghi b['fM]bgW\`]Y $_{\rm s}$ `]W\

k Ugʻ]WXʻVYbi hnYʻi bXʻk Ufi a ŁʻZ]bXYghʻXiʻ]bʻa Y]bYaʻ@Y]hZUXYbʻZØf ?Ua YfUUi gfØghi b[ʻZØfʻX]YʻFY]gY"

K Ybb'G]Y'Y]bYg'XYf': chcg'Ui Z'X]YgYf'K YVg]hY'j Yfk YbXYb
a ÒW hYbž'VYgi W Yb'G]Y'V]hhY'a Y]bY'@]nYbn]Yfi b[ggY]hYž'i a
\YfUi gni Z]bXYbž'k ]Y"'=\W 'j Yf\_Ui ZY'Ui W 'dfcZYgg]cbY``Y
?i bghXfi W\_Yž'VYgi W Yb'G]Y'a Y]bYb'Df]bh'GhcfY'cXYf'\_cbhU\_h]YfYb
G]Y'a ]W 'X]fY\_h'ZØf'Nc``UVnØ[Y'j cb'6]`XYfb'Ui Z'K Y'GYY\_'HfUj Y`"
U`h1 GHCB9M7F99?!: Ÿ@@9' 2

## 5i Z'D]bhYfYgh3

K Ufi a 'gdY]W\Yfb'G]Y'X]YgYb'FY]gYZØ\fYf'ni 'XYb'GhcbYm'7fYY\_: U``g'b]W\h'ZØf'gdÀhYf3'K Ybb'G]Y'K Y'GYY\_'HfUj Y``Ui Z'D]bhYfYgh Zc`[Ybž'V`Y]VYb'G]Y'a ]h'U``'XYb'bYi Yb'FY]gYZØ\fYfb'i bX'6`c[g'Ui Z XYa '@Ui ZYbXYb"

D-B '9G': C@ 9'A ∓

п

8 YhU]`q

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