## 



: `cf]XU g'Vi X[Yh'Wcbj YfgUh]cb']g'\YUh]b['i d'Ug'<ci gY'UbX'GYbUhY `YUXYfg'ghf]j Y'hc'Z]bU`]nY'U'bYk 'ghUhY'gdYbX]b['d`Ub'VYZcfY'h\Y \$\in\%'ghUfh'cZ'h\Y'Z]g\\\U'mYUf'''K ]h\'d]j chU`']ggi Yg'gh]``'cb'h\Y hUV`Yž'Vi X[Yh'bY[ch]Uh]cbg'UfY'a cfY'h\Ub''A gh'U'XUb\\Y'Ufci bX bi a VYfg h\Ym'\\ci `X']a dU\\h'Yj YfmXUm': `cf]X]Ubg'g][b]Z\\Ubh`m'

  $\label{thm:ckbyfg} $$ \ca YghYUX'dfcdYfhm'ckbYfg'''+b'U'fYWbh'a YYh]b[ \check{z}'GYbUhY 5ddfcdf]Uh]cbg'7 \U]fa Ub'9X'<ccdYf'UbX'<cigY'6i X[Yh 7\U]fa Ub'@Uk fYbW'A W7'i fY'YI W\Ub[YX'Vi X[Yh'c\ZZYfg\z'g\ck]b[U'k]'`]b[bYgg'hc'Wc'``UVcfUhY']b'h\YgY'W\U``Yb[]b['h]a Yg'''MYh\z'hYbg]cb'fYa U]bg'Ug'h\Ym'hUW_`Y'i bfYgc`j YX']ggi Yg\z'k]h\'<ccdYf jc]\Wb['Wcb\Wfbg'cj Yf'fYXi \WX'\ZYXYfU''\Z'\bX]b[']b'h\Y'dcgh!7CJ+8 \UbXg\WdY''+\g'U'\XY`]\WhY'\VU`\Ub\Wb[b['U\h\z'\k\YfY'Yj Yfm'XYhU]` a UhhYfg''$ 

## DfcdYfhmlHUI FY`]YZ =b]h]Uh]j Yg

 $5 \text{ `a U'cf'dc]} b \text{ `hc Z'WcbhYbh]} cb'fYj c'j Yg'Ufci b X'dfcdYfhm'hUl ghfi Whi fY" 5 WWcfX] b ['hc'HUl': ci b X Uh] cb ž'dfcdYfhm'hUl'] g'bch' 4 gh U'Z] g WU'hcc'/] h g'h\Y'Uf[Ygh'gci f WY'cZ'ghUhY'Ub X''c WU''fYj Ybi Y'] b h\Y'L "G" ž'Zi b X] b ['Wf] h] WU''g Yfj ] WYg''\]_Y'g W\\cc'\g'Ub X'fc U Xg'' 5 \h\ci [\':`cf] X U'Vc Ughg''ck 'Uj Yf U[Y'dfcdYfhm'hUl f UhYg fYdcfhY X'Uh' 4 gh'$"+(i 'Zcf'ck b Yf!c WW'd] Y X \ci g] b [ b Y k'm'di f W Ug Y X'\ca Yg' Uf Y'Z YY'] b ['h\Y'd] b W 'Ug \ci g] b ['j U'i Yg' Wcbh] bi Y'hc'f] g Y'' $ \ci g] b ['j U'i Yg' Wcbh] bi Y'hc'f] g Y''' $ \ci g] b ['j U'i Yg' Wcbh] bi Y'hc'f] g Y''' $ \ci g \ci g \ci g \ci g' Uf Y' Z YY' \ci g Yg' Uf Y' Z YY'' \ci g' Wcbh] bi Y'hc'f] g Y'''' $ \ci g' Y f'' Y f''$ 

8 YGUbh]gʻWcbj YbYXʻUʻfci bXhUVʻYʻhcʻX]gWʻggʻ\]gʻj ]g]cbʻZcf dfcdYfhmʻhUlʻfY`]YZžk \]W\ʻX]j Yf[YgʻZfca ʻh\Yʻ<ci gY gʻZcWʻgʻcb gUʻYgʻhUlʻWʻhgʻdf\] ygʻgʻdʻUbʻfk 6·+\$' 'ŁdfcdcgYXʻUʻk \cdd]b[ `("- 'V]``]cbʻ]bʻhUlʻWʻhgʻdf]a Uf]`mʻh\fci [\gu`YgʻhUlʻfYXi Wh]cb'' <ck Yj Yfž'8 YGUbh]gʻ]gʻU]a ]b[ʻZcfʻa cfYʻhUf[YhYXʻfY`]YZʻk]h\ gi [[Ygh]cbgʻ`]\_YʻUʻ`%ž\$\$\$'\ca YghYUXʻdfcdYfhmʻhUlʻfYVUhYʻZcfʻh\YbYl hʻhk cʻmYUfgžʻk \]W\ʻWci `XʻWcghʻUbʻYgh]a UhYXʻ`) "%ʻV]``]cbʻʻH\]g ghUbXcZZʻVYhk YYbʻh\Yʻ[cj YfbcfʻUbXʻh\Yʻ`Y[]gʻUhi fYʻi bXYf`]bYgʻU a UʻcfʻW\U`Yb[Y']bʻUʻ][b]b[ˈdf]cf]h]Yg.ʻ]a a YX]UhYʻfY`]YZʻj Yfgi g `cb[!hYfa 'Z]gWU`gi ghU]bUV]`]hm'

## : i hi fY HUI @cj Y`]Yg

H\Y'Vi X[Yh'hU`\_g'U`gc']bWi XY'dfcdcgU`g'hc'Y`]a ]bUhY'j UWUbh dcg]h]cbg'k ]h\]b'ghUhY'XYdUfha Ybhg ''' ('j UWUbW]Yg'dYf'h\Y GYbUhY g'gi [ [Ygh]cbž'j Yfgi g') %' 'dfcdcgYX'Vm'h\Y'< ci gY"'Gi W\XYW]g]cbg'WUb'[ fYUh`m']bZi YbWY'h\Y'YZZ]W]YbWm'cZ'ghUhY'gYfj ]WYg" A YUbk \]'Yž'8YGUbh]q'U]a g'hc'k cc'j chYfg'k ]h\'dchYbh]U`

 $\label{lem:webgh} \begin{tabular}{ll} $W$ bgh] hi h] cbu``Ua YbXa Ybhg`Zcf`dfcdYfhm`hUl `W`hg`h\Uh`a ][ \h`VY d`UWX`cb`VU``chg`]b`h\Y`i dWca ]b[ ``Y[ ]g`Uh]j Y`gYgg]cbg'' \end{tabular}$ 

± hYfYgh]b[`mž'Ubm'W hg'a ][\h'g\]Zh'Z]bUbW]U`'fYgdcbg]V]`]h]Yg'Zfca `cWU`'fYj Ybi Yg'hc'h\Y'ghUhYž'dcg]b['f]g\_g"'8 YGUbh]g'\Ug']bX]WUhYX h\Uh'UVci h'' \$'fi fU`'Wci bh]Yg'a ][\h'gYY\_'Ugg]ghUbW']Z'h\YgY dfcdYfhm'hUl 'W\Ub[Yg'[U]b'hfUWh]cb'Ua cb['j chYfg"'H\Y'WcbW'fb']g dU'dUV`Y.'\ck 'hc'a U]bhU]b'`cWU`'gYfj ]WYg'k \]`Y'YUg]b['h\Y'hUl Vi fXYbg'cb'fYg]XYbhg"

⇒ 'gi a a Ufmž' Ug': `cf]XU'\ Ug\ Yg'ci h']hg'Vi X[Yhž'U``'YmYg'k]``'VY
dYY`YX'Zcf'fYgc`i h]cbg'h\ Uh'VU`UbWY'bYWYggUfm'`cWU`'Zi bX]b['k]h\
fY`]YZ'YZZcfhg'U]a YX'Uh'fYg]XYbhg"'H\]g'Vi X[Yh'gYUgcb'Wci `X'VY
cbY'Zcf'h\Y'Vcc\_gž'UbX'k]h\ '`Uk a U\_Yfg'\ Ua a Yf]b['Uk Umž'h\YfY g
\cdY'h\ Uh'Wca dfca]gYg'WUb'VY'fYUW\YX'UbX'h\Y'bYYXg'cZ'U``
: `cf]X]Ubg'UfY'a Yh"

8 YhU]`g	
EiY``Yb	<ul><li>k k k "Ufci bXcgWYc`U"Wca</li></ul>
	<ul><li>hUI Zci bXUh]cb"cf[</li></ul>

6Ygi WXYb G]Y i bg Ui Z a Y]b!k ]Yb bYh