A Ud`Y'@YUZg': UWY'` &(A '8]`Ya a U. HUj UfYg'cf'A UfWX UbX3



 $\label{lem:hcfcbhc} Hcfcbhc `A Ud `Y `@Y UZg `Z]b X `h\ Ya gY `j Yg `Uh U `d]j chU` `Wfcggfc U Xg Z`hUg_Y X `k]h\ `U `g][b]Z] WUbh `XY W]g]cb `h\ Uh Wci `X `g\ Ud Y `h\ Y]f `fcghY f `Zcf `h\ Y `mY Ufg `hc `Wca Y " `5g `h\ Y m [fUdd `Y k]h\ `h\ Y `dfcgd Y Wh `c Z `]bj Ygh]b[`` &(`a]``]cb `cj Yf `h\ fYY `mY Ufg Z`h\ Y XY V UhY `WY bhY fg `Ufci b X `k \ Yh\ Yf `hc `Wca a]h `h\]g `gi a `hc `j YhY fUb \W bhY f `\&\ b `HUj UfYg `cf `hc `h\ Y `ZY]ghm `k]b[Yf `6fUX `A UfW Ub X " `H\ Y]a d`] WUh]cbg `c Z `h\]g `W c] WY `UfY `b ch `f gh `Z]b Ub W] U` / h\ Y m `Yb Wca d Ugg h\ Y `j Yfm `] X Y bh]hm `Ub X `Wca d Yh]h]j Y `Ugd] fUh]cbg `c Z `h\ Y `hY Ua "$

 $5 \ WWcfX]b[\ 'hc'A\ c\ hcfWmWY'Gdcfhgž' $\approx \ b'HUj\ UfYgž'Ub'YI\ dYf]YbWYXWbhYfž'\ Ug'[\ UfbYfYX'U'fYdi\ hUh]cb'Zcf'dfcj\]X]b[\ 'ghUV]`]hmž cfWXYghfUh]b[\ 'd`Umgž'UbX'WfYUh]b[\ 'cddcfhi b]h]Yg'cb'h\Y']WY''5h'' (mYUfg'c`Xž'HUj\ UfYg'\Ug'XYa\ cbghfUhYX'\]g'k\ cfh\'k\]h\'Ub$

]a dfYgg]j Y'hU``mcZ'(-' 'dc]bhg']b') %) '[Ua Yg'g]bW''c]b]b['h\Y @YUZg']b'&\$%, "': i fh\Yfa cfYž'\]g'`YUXYfg\]d'ei U`]h]Yg'a U_Y'\]a Ub']bj U`i UV`Y'UggYhž'YgdYW]U``m'k\Yb'Wcbg]XYf]b['h\Y'hYUa g bYYX'Zcf'XYdh\'Uh'WbhYf"'<]g'Yl dfYggYX'XYg]fY'hc'fYa U]b']b Hcfcbhc'UXXg'Ubch\Yf'`UmYf'hc'\]g'UddYU`ž'Ug'\Y']g'cdh]a]gh]W UVci h'\Ua a Yf]b['ci h'U'bYk' WcbhfUWh"

 $C b 'h \ Y 'Z] d 'g] X Y Z'' + !m Y Uf! c `X '6 f U X 'A Uf W \ Ub X Z' b c k '] b ` \] g '\% 'h \ 'B < @ g Y Ug c b Z' c ZZ Y f g 'U 'X] ZZ Y f Y b h g W f] d h'' '? b c k b 'Z c f ` \] g 'g W c f] b ['d f c k Y g g Ub X 'h Y b U W] hm Z' A Uf W Ub X ` \ Ug 'd f c j Y b ` \] g 'a Y hh `Y '] b ` \] [\ !d f Y g g i f Y g W b Uf] c g Z' b c h U V `m g W c f] b ['-_ Y m [c U 'g 'X i f] b ['d ` Um z Z' f i b g Z] b W i X] b ['U 'X f Ua Uh] W X c i V `Y! c j Y f h] a Y 'k] b b Y f '] b 'h \ Y 'G h Ub `Y m 7 i d :] b U `" 5 b U `mg h g 5 Uf c b '? c f c `b Y _ 'Ub X '7 Uf `c '7 c ` U] U C j c 'V f] b ['Z c f h \ W a d Y ``] b ['Uf [i a Y b h g 'c b 'V c h \ 'g] X Y g Z' g i [[Y g h] b ['h \ Uh 'k \] `Y H U j Uf Y g 'a U m Z] `` 'U 'W f i W J U ` [Ud 'Ug 'U 'W b h Y f Z' A Uf W Ub X g 'U V] `] h m h c U `h Y f 'h \ Y 'h Y Ua g 'g h `Y 'W c i `X 'V Y 'U ` [Ua Y ! W Ub [Y f '' 6 i h 'k \ Uh 'X c Y g h \] g 'a Y Ub 'Z c f 'h \ Y 'Z f Ub W] g Y g `` c b [!h Y f a 'j] g] c b 3 `$

K \ Uh g Uh GhU_Y 3

 $H\Y`XYW]g]cb`h\Y`A\Ud`Y`@YUZg`ZUWY`YI\ hYbXg`VYmcbX`]bX]j\]Xi\U`ghUh]gh]Wg`cf`WcbhfUWhi\U``Z][i\fYg'';\YbYfU``A\UbU[\Yf`6fUX`HfY`]j\]b[\Ug`i\bXYfgWcfYX`h\Y`bYYX`Zcf`U`g\]Zh`]b`hYUa\`]XYbh]hm`UZhYf`h\Y\X]gUddc]bha\Ybh`cZ`mYh`Ubch\Yf`YUf`m`d`UmcZZ'YI\]h''`K\]h\`h\Y`A\Ud`Y\@YUZg`U`fYUXm`\c`X]b[\`g][\b]Z]WUbh`WcbhfUWhg\gi\W\Ug`K\]``]Ua\Bm`UbXYf\g``\-&`a\]``]cb`XYU``UbX`A\]hW\Y```A\UfbYf\g``*)\`a\]``]cb\WcbhfUWh\\h\Y`Z]bUbW]U``]a\d`]WUh]cbg`cZ`U``\&(\`a\]``]cb`Wca\a\]ha\Ybh\`cca\``Uf[\Y']b`h\Y`ZfUbW\]gY\g`Vi\X[\Yh]b[\`UbX`ghfUhY[\]Wd`Ubb]b[\"\]$

HYFCUX5YUX

8 YW]X]b['VYhk YYb 'HUj UfYg'UbX'A UfW\UbX'Yd]hca]nYg'h\Y W\U``Yb[Yg'gdcfhg'ZfUbW\]gYg'WcbZfcbh h\Y'h][\hfcdY'k U`_'cZ VU`UbW]b[']a a YX]UhY'bYYXg'k]h\ '`cb[Yf!hYfa 'Ugd]fUh]cbg"'=\\Z'h\Y @YUZg'W\ccgY'hc'[c'k]h\ 'HUj UfYgž'h\Ym'a Um'j Yfm'k Y``'Zcfh]Zm'h\Y]f W\bhYf'dcg]h]cbž'j]hU``Zcf'Wca dYh]h]j Y'd`Um''7cbj YfgY`mž'cdh]b['Zcf A UfW\UbX'a Um']bgh]``'U'a i W\!bYYXYX'YX[Y'hc'h\Y'hYUa ž YgdYW]U``m'`UhY']b'[Ua Yg'k \YfY'YI dYf]YbWY'VYWca Yg'dUfUa ci bh''

I `h]a UhY`mž'h\Y'ZUhY'cZ'h\]g'XYW]g]cb'k]```]bZi YbWY'bch'cb`m'h\Y @YUZg ``]bYi d'Vi h'U`gc'h\Y]f'W\Ya]ghfm'UbX'Yj Yb'h\Y]f'ZUbVUgY g YI dYWhUh]cbg"'5g'UbU`mghg'k Y][\'h\Y'dfcg'UbX'Wcbgž']h g'Yj]XYbh h\Uh'k\]W\Yj Yf'dUh\'h\Ym'hU_Y'k]```VY'd]j chU``]b'XYZ]b]b['h\Y hYUa g'Zi hi fY"'K\YfY'Xc'mci 'ghUbX'cb'h\]g'Wfi W]U`'W\c]WY3'K]``h\Y'A Ud`Y'@YUZg'Vc`ghYf'h\Y]f'WcfY'ghUV]`]hm'k]h\'HUj UfYgž'cf'f]g_h\Y'[Ua V`Y'UbX'gk]b['Zcf'U'XmbUa]Wg\]Zh'k]h\'A UfW\UbX3

8 Y hU]`g	
Cfh	Hcfcbhcž ⁻ 7UbUXU
EiY``Yb	a chcfWhWYgdcfhg"bYh
	kkk"gdcfhg_YYXU"Wca
	• k k k "gdchfUWWca

6 Ygi W Yb G]Y i bg Ui Z a Y]b!k]Yb "b Yh