## BYk 'Mcf\_Yf'5ffYghYX'Zcf'A Uf]'i UbU 8i f]b['HfUZZ]WGhcd']b'Cl ZcfX

5 BYk 'Mcf\_Yf'k Ug'UffYghYX'Zcf'a Uf]'\(^1\) UbU'dcggYgg]cb'Xi f]b[U'hfUZZ]Wghcd']b'Gi a hYf'7ci bhm"'@YUfb'a cfY'UVci h'h\Y]bW]XYbh\(^2\) \(^1\) \(^1\) \(^2\) \(^1\) \(^



7ci bhm FcUX (+&  $\sharp$  CI ZcfX  $\sharp$  Gi a hYf 7ci bhm  $\sharp$  I G5 '! Cb'h\Y Yj Yb]b[ 'cZ'  $\sharp$  `m'%)  $\sharp$  &\$ &\$ )  $\sharp$  U'hfUZZ]Wghcd cb' I "G"'' \$% `YX'hc'h\Y UffYgh'cZ'U'BYk 'Mcf\_Yf'Zcf'a Uf]  $\sharp$  UbU'dcggYgg]cb"'A Y`Ub]Y DU'a ]Yf]  $\sharp$  'U'a, !mYUf!c`X'Zfca 'GhUhYb'= $\mathfrak{g}$ `UbX $\sharp$ 'k Ug'Xf]j ]b[ '\Yf'g]`j Yf &\$ \% \\* < cbXU'5 \WcfX'k \Yb'`Uk 'YbZcfWa Ybh'cZZ]\W]U`g'bch]\WYX'\Yf j Y\]\WY'\UX'U'bcb!Z b\Wh]cb]b[ 'hU[ '`][ \h"'H\Y'XYdi hm'cb'Xi hm a UXY'h\Y'ghcd'Ufci bX'- 'd"a "'Uh'h\Y']bhYfgY\Wh]cb'k ]h\'7ci bhm FcUX'(+&']b'CI ZcfX"

5g'h\Y'XYdi hm'UddfcUW\YX'h\Y'WUfž'U'X]gh]bWh'cXcf'cZ'a Uf]'\UbUZ]``YX'h\Y'U]fž'dfca dh]b['Zi fh\Yf']bj Ygh][Uh]cb"'8 Ygd]hY'Vch\DU`a ]Yf]'UbX'\Yf'g]ghYfž'k \c'k Ug'U'dUggYb[Yf']b'h\Y'j Y\]WYžXYbm]b['Ubm'\_bck `YX[Y'cZ'WUbbUV]gž'h\Y'gYUfW\'cZ'h\Y'WUf

m]Y`XYX`U`a Uf]^\ UbU`W][ UfYhhY`UbX`U`ga U```dUW\_U[Y``UVY`YX` H<7 YX]V`Yg" `H\]g`X]gWcj Yfm``YX`hc`\Yf`UffYgh`Zcf`dcggYgg]cb`cZ a Uf]^\ UbU": c``ck ]b[ `h\Y`]bW]XYbhž`g\Y`k Ug`Vcc\_YX`Uh`h\Y`Gi a hYf 7 ci bhm`8YhYbh]cb`7YbhYf`UbX``UhYf`fY`YUgYX`UZhYf`dcgh]b[ `U ` %\\$\$\$\VcbX\z`Ug`fYdcfhYX`Vm`J ]``U[Yg!BYk g"

## A Uf]'i UbUI gY ]b h\Y I b]hYX GhUhYg

 $\label{thm:continuous} H\Y'UffYgh'cZ'DU'a\ ]Yf]']g'U'ghUf_'fYa\ ]bXYf'cZ'h\Y'cb[c]b[ Wcbj YfgUh]cbg'gi ffci bX]b[ 'WUbbUV]g'i gY'UWfcgg'h\Y'I b]hYX GhUhYg'''5\WcfX]b[ 'hc'XUhU'Zfca 'h\Y'787ž'a Uf]'i UbU'i gU[Y'\Ug VY\Wca Y']b\WfYUg]b[ 'm'\Wca a cbž'YgdY\W]U``m'Ua cb[ 'UXi `hg'UbX mci h\''Gi fj Ymg'gi \W\'Ug'h\Y'6Y\Uj ]cfU'`F]g_': U\Wcf'Gi fj Y]``Ub\W GmghYa 'f\GF': GG\E'UbX'h\Y'\Mci h\'F]g_'6Y\Uj ]cf'Gi fj Y]``Ub\W cZ'\WUbbUV]g'\Wcbgi a dh]cb''$ 

H\Y'787'Ya d\Ug]nYg'h\Uh'cb[c]b['gi fj Ymg'a cb]hcf'j Uf]ci g
UgdYWhgž']bWi X]b['\YU'h\'VY\Uj]cfg'UbX'f]g\_g'UggcW]UhYX'k]h\
WUbbUV]g'i gY'': cf']bghUbW'ž'h\Y'BUh]cbU`'<YU`h\'UbX'Bi hf]h]cb
9I Ua]bUh]cb'Gi fj Ym'fB < 5B9GŁ'Wc``YWhg'Wca dfY\Ybg]j Y'XUhU'cb
Xfi ['i gY'UWfcgg'X]ZZYfYbh'XYa c[fUd\]Wg'''H\]g']bZcfa Uh]cb']g
Wfi W]U`'Zcf'dc`]Wha U\_Yfgž'\YU`h\'cZZ]W]U`gž'UbX'h\Y'Wca a i b]hm'Ug
h\Ym'bUj][UhY'h\Y'Wca d`YI]h]Yg'cZ'WUbbUV]g'`Y[]g`Uh]cb'UbX
\YU`h\']a dUWhg"

## I bXYfghUbX]b[ 'h\Y'@UbXgWUdY'cZ'7UbbUV]g I gY

5g'Uhh]hi XYg'hck UfX'WUbbUV]g'Wcbh]bi Y'hc'Yj c'j Yž']h g']a dcfhUbh hc'Wcbg]XYf'\ck 'h\YgY'W\Ub[Yg'UZZYWhj Uf]ci g'Wca a i b]h]Yg"'H\Y 5XX]Wh]cb'; fci d'dc]bhg'ci h'h\Uh'h\Ym'dfcj ]XY'gi ddcfh'Zcf ]bX]j ]Xi U'g'[fUdd']b['k]h\'WUbbUV]g'XYdYbXYbWhž'\][\'][\h]b['h\Y bYWYgg]hm'cZfYgci fWYg'h\Uh'Ugg]gh'k]h\'hfYUha Ybh'cdh]cbg"'H\Y]f\\Y'd`]bY']g'Uj U]'UV'Y'&(#+'Zcf'h\cgY'gYY\_]b['\Y'dž'Ya d\Ug]n]b[h\Uh'X]gW' gg]b['hfYUha Ybh']g'ZfYY'cZ'cV`][Uh]cb'hc'YbhYf'Ubm dfc[fUa"

: ][ifYg']bX]WUhY'h\Uh'WUbbUV]g'\Ug'VYWca Y'cbY'cZh\Y'a cghiigYX gi VghUbW'g'Ua cb['mci b['UXi `hgž'UbX'h\Y'bi a VYfg'\_YYd W]a V]b['"H\Y']bg][\hg'dfcj]XYX'Vm'h\Y'5XX]Wh]cb'; fci d']``i ghfUhY h\Y'gcW]YhU``g\]Zh'UbX'h\Y']bWfYUg]b['bYYX'Zcf'UVWYgg]V`Y fYgci fWYg'Zcf'h\cgY'YI d`cf]b['h\Y]f'fY`Uh]cbg\]d'k]h\'a Uf]'\UbU" 5g'gYYb']b'h\Y'WUgY'cZ'DU`a]Yf]ž'Yj Yb'WUgi U``YbWci bhYfg'WUb YgWU`UhYž``YUX]b['hc'gYf]ci g'`Y[U``fYdYfW'gg]cbg"

±b`WcbWig]cbžk\Yh\Yf']hg`U`hfUZZ]Wghcd`cf`diV`]Wdc`]Wm
X]gWigg]cbgžh\Y`hcd]WcZa Uf]¹\UbU`]g`Yj Yf!dfYgYbh`UbX
XYgYfj]b[`cZ`WUfYZi``Wcbg]XYfUh]cb"`H\Y`g]hi Uh]cb`k]h\`DU`a]Yf]
gYfj Yg`Ug`U`a]WfcWcga `cZ`h\Y``Uf[Yf`XYVUhYg`Ufci bX`WUbbUV]g`]b
h\Y`I b]hYX`GhUhYgž`Yb[U[]b[`ig`]b`U`bYYXYX`X]U`c[iY`UVci h`igYž
`Y[U`]hmž`UbX`\YU`h\"

8 Y hU]`g	
Cfh	7 ci b hm F c U X (+ & ž C   Zc f X ž G i a h Y f 7 c i b hm ž   G5
EiY``Yb	<ul> <li>k k k "j ]``U[ Yg!bYk g"Wca</li> <li>k k k "WX W'[ cj</li> <li>k k k "UXX]Wh]cb[ fci d"cf[</li> </ul>

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