5 hhY b X U b WY '7 f]g]g. 'B Y U f`m'C b Y 'A]``]c b : `cf]X U 'G hi X Y b hg 'A]gg 'G W cc`°

9gWJa V]U'7ci bhm'ZUWYg'f]g]b['UVgYbhYY]ga ']b'gWkcc`g'dcgh!dUbXYa]Wz'dfca dh]b['YZZcfhg'hc']a dfcj Y'UhhYbXUbWY'UbX gi ddcfh'ZJa]`]Yg"



9gWUa V]U·7ci b hmž: `cf]XUžI G5 !: `cf]XU·gWkcc`g·UfY·ZUW]b[`Ubid\]```VUhhYik\Ybi]hiWca Ygʻhcʻghi XYbhiUVgYbhYY]ga "FYdcfhg]bX]WUhYih\]gʻ]ggi YʻfYa U]bgʻUʻg][b]Z]WUbhiWcbWfbʻ]bʻh\Yik U_YʻcZh\YidUbXYa]Wik]h\`bYUf`mcbYa]``]cbʻghi XYbhgʻ]bʻ: `cf]XUa jgg]b[`a cfYʻh\Ubʻh\fYYʻk YY_gʻcZʻgWkcc```UghʻmYUf"·H\]gʻhfYbX\Ugʻbch'UVUhYXžʻUgʻUVgYbhYY]ga fUhYgʻWcbh]bi Yʻhcʻ\cj YfʻUVcj YdfY!dUbXYa]WʻYj YʻgžʻdUfh]Wi`Uf`m`]bʻ9gWJa V]UžʻGUbhUʻFcgUžʻUbXC_UʻccgUʻWci bh]Ygžk\]Wkʻ\Uj YʻU```fYdcfhYXʻUʻk cffm]b[`f]gYʻ]ba]ggYXʻgWkcc``h]a YʻZfca &\$%-`hc`&\$&%"`K\]`YʻBcfh\kYgh: `cf]XU gʻcj YfU```UVgYbhYY]ga `fUhYgʻUfYʻ`ck Yfʻh\Ubʻh\YʻghUhYUj YfU[Yž']hgʻWYUfʻh\UhʻGUbhUʻFcgUʻUbX`C_U`ccgUʻWci bh]YgʻUfY

K 95F 'HJ '\][\'][\hg'h\Uh'GUbhU'FcgU'7cibhm'\Ug'a UXY'ghf]XYgžUW\]Yj]b['U'cbY!h\]fX'fYXi Wh]cb']b'UVgYbhYY]ga 'g]bW'&\$&\"GidYf]bhYbXYbh'8f"'?UfYb'6UfVYf']g'_YYb'cb'ZcghYf]b[
Wc'`UVcfUh]cb'k]h\'ZUa]`]Yg'hc']a dfcj Y'ghi XYbh'UhhYbXUbW'''=b
WcbhfUghž'9gWUa V]U'7cibhmg'UVgYbhYY]ga 'fUhY'fYa U]bg'UVcj Y
h\Y'ghUhY'Uj YfU[Yž'k]h\'5gg]ghUbh'GidYf]bhYbXYbh'8Ybbm'K]`gcbbch]b['h\Uh'UVcih'\%1 'cZ'h\Y'X]ghf]Whg''+ž)\$\$'ghi XYbhg'UfY
Y]h\Yf'a]gg]b['gW\cc`'cf'hUfXm YeiUh]b['hc'bYUf`m'(ž\$\$\$
W\]`XfYb"'9ZZYWh]j Y'ghfUhY[]Yg'gi W\'Ug'cbY!cb!cbY'a YYh]b[g'k]h\
ZUa]`]Yg'UfY'VY]b['Udd`]YX']b'Vch\'Wcibh]Yg'hc'hUW_`Y

$7 \cdot fcb]W5VgYbhYY]ga cbhYYF]gY$

H\Y`g]hi Uh]cb`]g`bchi b]ei Y`hc`h\YgY`Wci bh]Yg"`5\W\cfX]b[`hc`; cj Yfb]b[ž`UVgYbhYY]ga `]b`: `cf]XU`\Ug`gcUfYX`Vmcj Yf`) \$i g]b\W`h\Y`dUbXYa]\WUbX`ghUbXg`Uh`U`Ufa]b[``Yj Y`g`U\fcgg`h\Y ghUhY"'\dotb\Y`&\$\%, !\%- `g\W\cc``m\YUfž`Uddfcl]a UhY`m`&\$i ``cZ': `cf]XU di V`]\Wg\W\cc``ghi XYbhg`k YfY`\WUgg]Z]YX`Ug`\W\fcb]\\U``m`UVgYbh"`H\]g\Z][i fY`g_mfc\W_YhYX`hc`cj Yf'' &i `dcgh!7CJ\dotb\Y`\Ug`fYa U]bYX\U\cj Y`'\% \] `]bhc`h\Y`\W`ffYbh`g\W\cc``m\YUf"`7YbhfU``: `cf]XU`\Ug`ZY`h\\]g\]a dU\\h`U\W\hY`m\z`k]h\`cj Yf`\%() \z\\$\$\$ ghi XYbhg`fYdcfhYX`Ug\\M\fcb]\\U\``m`U\gYbh\h\cgY`k\c`a]gg`\%, `cf`a cfY`XUmg`]b`h\Y\U\UXYa]\\mY\Uf"

 $\label{thm:condition} $$H\Y'dUbXYa]W\Ug'X]gfi\ dhYX'h\Y'VcbXg'h\Uh'ZUa]`]Yg'cbW''\UX k]h\h' h\Y]f'gW\cc`gž'dUfh]W'`Uf`m'UZZYWh]b['h\cgY']b'dcj Yfhm''5g'U fYgi `hž'W\fcb]WUVgYbhYY]ga '\Ug'VYWca Y'h][\h`m`]b_YX'hc'dccf UWUXYa]WdYfZcfa UbW'ž'k]h\'a]XX`Y'gW\cc`Yfg'g`]X]b['hc'h\Y]f`ck Ygh'hYgh'gWcfYg']b'cj Yf'hk c'XYWUXYg'''BchUV`mž': `cf]XU'fUb_g ($h\'bUh]cbU``m'Zcf'W\fcb]WUVgYbhYY]ga ž'U'WcbW'fb]b['ghUh]gh]W VYhhYf'h\Ub'cb`m'hYb'ghUhYg''$

GhfUhY[]Yg'UbX'7\U``Yb[Yg'; c]b[': cfk UfX

±b``][\h`cZ`h\YgY`W\U``Yb[Ygž``cWU``YXi WUhcfg`\Uj Y`ghUfhYX]ad`YaYbh]b['U`fUb[Y`cZ`ghfUhY[]Yg`hc`WcaVUh`h\]g`dYfg]ghYbhdfcV`Ya"'H\YgY`ghfUhY[]Yg`fUb[Y`Zfca`\caY`j]g]hg`UbX`hfi UbWh

Wci fhg hc j Uf]ci g WUhW !i d dfc[fUa g" 7ca a i b]hm Yb[U[Ya Ybh YZCfhg \ Uj Y VYYb fUa dYX i dž hUf[Yh]b[ZUa] \]Yg X]f Y Wh m k \] Y dfcj]X]b[gc W]U g Yfj]W g Ygg Ybh]U Zcf gi ddcfh]b[UhhYb X Ub W " < ck Yj Yf Z X Ygd]h Y h Yg Y Y Z Cfhg Z Y[]g Uh]j Y UWh]cbg hc UXXf Ygg UVg Ybh Y Y]ga cb U Vfc UXYf g W Y \ Uj Y gh U Y X Z k]h dfcdcg Y X V] g ZU] b[hc [U]b h f U Wh]cb]b h Y G Yb Uh "

BchUV`mžghi XYbhg``]_Y j Ub: `cfYg`cZZYf`U`[`]a a Yf`cZ`\cdY"5ZhYf ghfi [[`]b[`k]h\`UhhYbXUbW\žYgdYW]U``m`Xi f]b[`fYa chY``YUfb]b[`]b b]bh\`[fUXYž: `cfYg`]a dfcj YX`\]g`gW\cc``dUfh]W]dUh]cb`UZhYf Ybfc``]b[`]b`U`bccb!hc!) `dfc[fUa `Uh`9j Ubg`<][\`GW\cc`"`<Y`]g bck `di fgi]b[`U`k Y`X]b[`hYW\bc`c[m`dfc[fUa `Uh`J U`YbW]U`7c``Y[Yž XYa cbghfUh]b[`h\Uh`hUf[YhYX`gi ddcfh`WUb`a U_Y`U`X]ZZYfYbWY`]b`U ghi XYbhg`YXi WUh]cbU``^ci fbYm"

H\Y'bi a VYfg'UfY'hfci V`]b[ž'Vi h'h\YfY g'gca Yh\]b['hc'VY'gU]X'Zcf h\Y'fYg]`]YbW'cZ': `cf]XU g'gW\cc`g"'5g'X]ghf]Whg'ghf]j Y'Zcf gc`i h]cbgž'h\Y'[cU`'fYa U]bg'WYUf.'hc']a dfcj Y'UhhYbXUbW''fUhYg k YY_'UZhYf'k YY_"'=h g'U'W\U``Yb[]b['fcUXž'Vi h'k]h\'Wca a]ha Ybh UbX'Wc``UVcfUh]cbž'dfc[fYgg']g'k]h\]b'fYUW\"

8 Y hU]`g	
Cfh	9gWUa V]U'7ci bhmž': `cf]XUž'I G5
EiY``Yb	• k YUfhj "Wca
	• k k k "[cj Yfb]b["Wca

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