

J Yf_Y\fgi bZU```]b GcbXYfg\Ui gYb. D_k! ?c``]g]cb']b XYf'K]`\Y`a!?Ø`n!GhfU»Y

5a '8]YbghU['_Ua 'Yg']b'XYf'K]`\Y`a !?Ø`n!GhfU»Y'ni 'Y]bYa D_k!I bZU```a]h'Y]bYa 'JYf`YhnhYb"'Dc`]nY]'Yfa]hhY`h'k Y[Yb ZU\f`Àgg][Yf'? ÒfdYfj Yf`Yhni b["

 $GcbXYfg\ Ui\ gYb\check{z}'Y]bY'GhUXh\check{z}'X]Y'ZØf']\ fY'fi\ \][\ Yb'GhfU\ Yb'VY_Ubbh]gh\check{z}'k\ i\ fXY'Ua''8]YbghU[\ a\ cf[\ Yb'i\ a\ 'Yhk\ U'\$, .'')'I\ f'j\ cb'Y]bYab]Wkh'U``hÅ[`]WkYb'JcfZU```YfgWkØhhYfh'''NkY]'D_k'gh]Y''yb']b'XYfK]'\ Y`a!?Ø`n!GhfU\"Y'ni\ gUa\ a\ Yb\check{z}'k\ Ug'ni\ 'WkUch]gWkYb'GnYbYb\ ZØ\fhY'''5bk\ c\bYf'i\ bX'DUggUbhYb'k\ UfYb'ØVYffUgWkh'j\ cb'XYf\ d`Ohn`]WkYb'GhOfi\ b['XYf'A\ cf[Ybgfci\ h]bYž'X]Y'Xi\ fWk'X]YgYb'I\ bZU``Ui\ g[Y_bc\ W_h'k\ i\ fXY''$

9fghY'6Yf]WkhY'j cb'XYf'I bZU``ghY``Y'nY][Ybž'XUgg'Y]b': U\fnYi [ž XUg'g]Wk'j cf'XYa 'UbXYfYb'VYk Y[hYž'gY]bY'; YgWkk]bX][_Y]h XfcggY`hY"'8]Yg'j YfUb`UgghY'XYb': U\fYf'XYg'\]bhYfYb': U\fnYi [gž XYb', VYf\c`j cf[Ub['Y]bni `Y]hYb"'8cWk'k À\fYbX'g]Y'VY]XY j Yfgi WkhYbž']\fY': U\fnYi [Y'ni 'VYgWk`Yi b][Ybž'_Ua 'Yg'ni f ?c``]g]cb"'8]Y'[YbUi Yb'I a ghÀbXY'g]bX'XYfnY]h'bcWk'; Y[YbghUbX XYf'9fa]hh`i b[Yb'XYf'Dc`]nY]]bgdY_h]cb'?mZ\ài gYf"'9]b' &gUggY Y]bYg'XYf': U\fnYi [Y'nc['g]Wk'VY]'XYa 'JcfZU``'JYf`Yhni b[Yb'ni ž k Ug'XYb'9fbgh'XYf'@U[Y'i bhYfghfY]Wkh"

、VYfV`]W_'ØVYf'XYb'JcfZU``

 $8\ Yf'5i\ ZdfU```k\ Uf'gc\ `\YZh][\ \check{z}'XUgg'VY]XY'5i\ hcg'UbgW\`]Y\ YbX'b]W\ h$ $a\ Y\ f'ZU\ fVYfY]h'k\ UfYb'''8\]Y'Bchk\ YbX][\ _Y]h\check{z}'X]Y':\ U\ fnYi\ [\ Y\ UVgW\ `YddYb'ni\ ``UggYb\check{z}'nY][\ h\check{z}'k\]Y'Yfbgh'XYf'I\ bZU```k\ Uf'''Dc`]nY] i bX'FYhhi\ b[\ g_fÅZhY'k\ UfYb'gW\ bY``'ni\ f'GhY``Yž'i\ a\ 'X]Y'J\ Yf`YhnhYb\ ni\ 'j\ Yfgcf[\ Yb'i\ bX'X]Y'G]hi\ Uh]cb'ni\ 'YbhgW\ ÅfZYb'''8\]Y'9fa\]hh`Yf$

 $\label{lem:condition} $$ \UVYb^b bi b^X]Y^5i Z[UVY\check{z}^XYb^c[YbUiYb^c< Yf[Ub[^XYg^l]bZU^*g^nifY_cbghfi]YfYb"$

 $8]Y `9b hg W Y] Xi b [`XYf `Dc`]nY] \check{z} k Y [Yb `XYg `J Yf X U W kg `XYf Z U \ f` Å g g] [Yb `? Ofd Y fj Yf` Yhni b [`ni `Yfa]hh Y`b \check{z}]gh Y] b `k] W kh] [Yf G W K f] hh `]b `X] Y g Ya `Df c n Y g g " : U \ f` Å g g] [Y `? Ofd Y fj Yf` Yhni b [`]gh Y] b f Y W kh`] W Y f `6 Y [f] Z Z X Y f `j Y fk Y b X Y h `k] f X ž k Y b b `Ya U b X `Xi f W W B U W `A g g] [_Y] h `c X Y f `i b Ø V Y f` Y [h Y g ' < U b X Y` b `Y] b Y f `U b X Y f Y b `D Y f g c b G W U X Y b `ni Z Ø [h " \ \D X] Y g Y a `: U `` _Obb h Y `X Y f ` <] b h Y f [fi b X `X Y g , V Y f \ c`a U b Oj Y f g `Y] b Y `n Y b h f U `Y `F c`` Y `g d] Y `Y b "$

8 Y hU]``]Y f hY '=b Zcg'i b X 'a Ò[`]W\ Y ? cbgYei Y b n Y b

8]Y'K]`\Y`a !?Ø`n!GhfU»Y']gh'b]W\h'[YfUXY'XUZØf'VY_Ubbhž GW\Ui d`Uhn'j cb'gW\k YfYb'JYf_Y\fgi bZ\`Yb'ni 'gY]b"'8]YgYf JcfZU``'_ÒbbhY''YXcW\'U'g'K Ufbg][bU`'ZØf'UbXYfY JYf_Y\fghY]`bY\a Yf'X]YbYb"'9g']gh'b]Y'fUhgUa ž']b'Y]bYf'G]hi Uh]cb ni 'ØVYf\c`Ybž']b'XYf'X]Y'; YgW\k]bX][_Y]h'XYg'j cfXYfYb : U\fnYi [g'g]b_h''Gc`W\Y'i bØVYf`Y[hYb'9bhgW\Y]Xi b[Yb'_ÒbbYb ZUhU'Y': c`[Yb'\UVYbž'gck c\`'ZØf'X]Y': U\fYf'U`g'Ui W\'ZØf'X]Y 6Y]ZU\fYf"

JYf_Y\fgi bZÀ``Y`\UVYb`cZh`b]W\h`bi f`i ba]hhY`VUfY`d\mg]gW\Y
5i gk]f_i b[Yb`Ui Z`X]Y`6YhY]`][hYbž`gcbXYfb`Ui W\`Ya ch]cbU`Y`i bX
fYW\h`]W\Y`: c`[Yb"'\XXYfž`XYf`]b`Y]bYb`gc`W\Yb`JcfZU```j Yfk]_Y`h
]ghž`a i gg`g]W\`a]h`XYb`: c`[Yb`Ui gY]bUbXYfgYhnYbž`X]Y`j cb
a YX]n]b]gW\Yb`?cghYb`V]g`ni 'dchYbn]Y``Yb`fYW\h`]W\Yb`GW\f]hhYb
fY]\\\Yb`_ObbYb"'6YgcbXYfg`]b`: À``Ybž`]b`XYbYb`Ya UbX`j Yf`Yhnh
k]fXž'_ObbYb'X]Y`, VYf`Y[i b[Yb`ZØf`U``Y`6YhY]`][hYb`_ca d`Yl
k YfXYb"

8]Y'9fa]hhii b[Yb'XYf'Dc`]nY]'k YfXYb'Ui W 'XUfUi Z'UVn]Y`Ybž'cV'Yg k Y]hYfY': U_hcfYb'[UVž'X]Y'ni 'X]YgYa 'I bZU``'VY][YhfU[Yb'\UVYb_\ObbhYbž'k]Y'Yhk U'X]Y'K YhhYfVYX]b[i b[Yb'cXYf'UbXYfY 5V`Yb_i b[Yb'''\delta' XYf'\Yi h][Yb'NY]hž']b'XYf'5V`Yb_i b[Yb'Xi fW\ < UbXmg'i bX'UbXYfY'HYW\bc`c[]Yb'ni bY\a Ybž']gh'Yg'k]W\h][Yf XYbb'Yž'Ui Za Yf_qUa 'ni 'gY]bž'k Ybb'a Ub'q]W\`\]bhYf'XYa 'GhYi Yf

9]b 6`]W Ui Z'X]Y U_hi Y``Y J Yf_Y\fgg]hi Uh]cb

8]YgYfJcfZU```]b`GcbXYfg\Ui gYb`_ObbhY`Ui W\`Y]bYb`[fO`>YfYbHfYbX`]a `GhfU>YbjYf_Y\f`k]XYfgd]Y[Y`b"'=a a Yf`a Y\f`A YbgW\Ybg]bX`hÀ[`]W\`Ui Z`XYb`GhfU>Yb`i bhYfk Y[gži bX`X]Y

K U\fgW\Y]b`]W_Y]h'j cb`I bZÀ``Yb`ghY][h"'8]Y`6Y\OfXYb`g]bX
[YZcfXYfhž`Xi fW\`5i Z_`Àfi b[ž`G]W\Yf\Y]hggW\i`i b[Yb'i bX
j YfghÀf_hY`Dc`]nY]dfÀgYbn`XUg`: U\fjYf\U`hYb`XYf`A YbgW\Yb`ni
VYY]bZ`i ggYb"'8i fW\`XUg`JYfghÀbXb]g`i bX`X]Y`I a gYhni b['j cbdfÀjYbh]j Yb`A U>bU\a Yb`_ObbYb`Yfbgh\UZhY`I bZÀ``Y'j Yf\]bXYfhkYfXYb"

CVXYfil bZU```]b'XYf'K]`\Y`a!?Ø`n!GhfU»Y'XUni 'ZØ\fYb'k]fXž'XUgg X]Y'JYf_Y\fgg]W\Yf\Y]h'Yfbgh\UZh']b'XYb': c_i g'fØW_hž'V`Y]Vh UVni k UfhYb"'=b'XYf'Nk]gW\YbnY]h'\cZZYb'U``Y'6YhY]`][hYbž'XUgg g]W\X]Y'j Yf`YhnhY'DYfgcb'gW\bY``'Yf\c`Yb'_Ubb'i bX'XUgg'gc`W\Y JcfZÀ``Y']b'Ni_i bZh'j Yfa]YXYb'k YfXYb'_ÒbbYb"

I b ZU``ghUh]gh]_]b 8 Yi hgW\`Ub X

8]Y'I bZU``nU\`Yb']b'8Yi hgW\`UbX'g]bX']b'XYb'`YhnhYb'\J\fYbgW\k Ub_YbX'[YV`]YVYb"'@Ui h'XYb'U_hi Y``Yb'GhUh]gh]_Yb'XYg'GhUh]gh]gW\Yb'6i bXYgUa hYg'[UV'Yg']a '\J\f'&\&\\]bg[YgUa hYhk U'\&\Z' 'A]``]cbYb'dc`]nY]`]W\'YfZUgghY'JYf_Y\fgi bZ\A``Y''8UVY]g]bX'fi bX'\&")\\$\AYbgW\Yb'h\OX`]W\'j\fi b[`\Ø\\h\Z'\k\\A\fYbX'Yhk U'\\$\S\"\\$\DYfgcbYb'j\Yf`Yhnh'k i fXYb"'8]Y'\\Ai\Z][ghYbIbZU``i fgUW\Yb'g]bX'5V`Yb_i b[\Z'; YgW\k]bX][_Y]hgØVYfhfYhi b[Ybi bX', VYfa ØXi b["

a JYf[`Y]W\`ni `XYb`Jcf′U\fYb`]gh'X]Y`NU\``gW\k YfYf

JYf_Y\fgi bZÀ``Y`\]Yfni `UbXY`[Ygi b_Ybž'k Ug`Ui Z'j YfVYggYfhY

JYf_Y\fga U» bU\a Yb`i bX`Y]bY`j YfghÀf_hY`, VYfk UW\i b[

ni fØW_ni ZØ\fYb`gY]b`_ÒbbhY"'8]Yg`ZØ\fh`YXcW\`b]W\h`ni `Y]bYf

U``[Ya Y]bYb`9bhk Ufbi b['Ui W\`U``hÀ[`]W\Y`G]hi Uh]cbYbž'k]Y`XYf

I bZU```]b`XYf`K]`\Y`a !?Ø`n!GhfU» Yž'nY][Ybž'XUgg`Ui W\`]b

j Yfa Y]bh`]W\`\Ufa `cgYb`JYf_Y\fgj Yf\À`hb]ggYb`; YZU\fYb``Ui Yfb

$: c'[Yb']cb'JYf_Y\fgibZA``Yb$

JYf_Y\fgi bZÀ``Y'\UVYb'b]W\h'bi f'd\mg]gW\YžgcbXYfb'Ui W\dgmW\]gW\Y'5i gk]f_i b[Yb'Ui Z'X]Y'VYhfcZZYbYb'DYfgcbYb'i bX']\fY 5b[Y\Of][Yb"CZh_ca a h'Yg'ni 'dcghhfUi a Uh]gW\Yb 6Y`Ughi b[gghOfi b[Yb'fDH6GŁŽ'X]Y'XUg'U``hÀ[`]W\Y'@YVYb'Yf\YV`]W\VYY]bhfÀW\h][Yb'_ObbYb"'@Ui h'Y]bYf'Ghi X]Y'XYg'
6i bXYga]b]ghYf]i a g'ZØf'JYf_Y\f'`Y]XYb'Yhk U'%\$i 'XYf A YbgW\Ybž'X]Y']b'Y]bYb'gW\k YfYb'JYf_Y\fgi bZU``'j Yfk]W_Y`h k UfYbž'i bhYf'`Àb[YfZf]gh][Yb'dgmW\]gW\Yb': c`[YYf_fUb_i b[Yb"

8]Y'fYWh]W\Yb': c`[Yb'_ObbYb'ni XYa 'gY\f'_ca d`Yl'gY]bž
]bgVYgcbXYfY'k Ybb'9fa]hhi b[Yb'k Y[Yb'ZU\f`Agg][Yf
? OfdYfj Yf`Yhni b['Ub[YghY``h'k YfXYb"'=b'gc`W\Yb': A``Yb']gh'Yg
k]W\h][Z'X]Y'[YbUi Yb'l a ghAbXY'XYf'?c``]g]cb'i bX'X]Y
J YfUbhk cfhi b['XYf'Yk Y]`][Yb': U\fYf'ni '_`AfYbZ'i a
Ub[Ya YggYbY'fYW\h`]W\Y'GW\f]hhY'Y]b`Y]hYb'ni '_ObbYb"

8 YhU]`g

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z 'b!U["XY