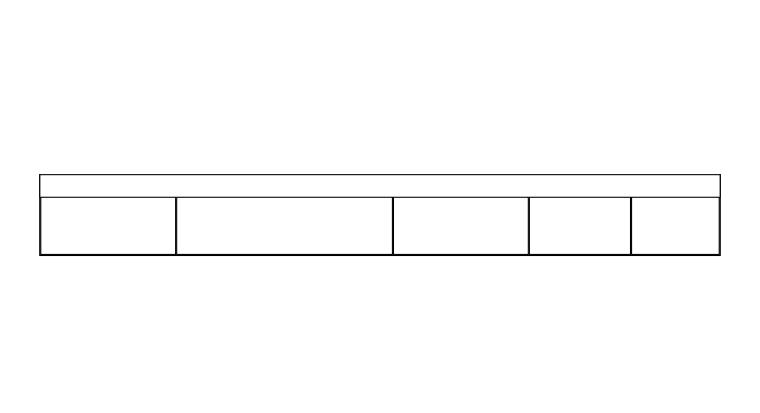


ARTS3061

GWYYb DfcXi Wjcb = fJ]XYc Dfc YWŁ



7ci fgY 8YW] g

7 fYX]hDc]bhg * *

Gi a a UfmcZh\Y 7ci fgY

H\]g'Wci fgY'dfcj]XYg'gca Y'dfUWj\W\"Yl dYf]YbWr']b'j]XYc!a U_]b['UbX'[]j Yg'mci 'Ub'i bXYfgHUbX]b['cZh\Y VUg]WWcbW'dhg'h\Uhi bXYf]Y'U'j]XYc'dfcXi Wfjcbz'Zfca 'gWf]dhhc'Z]bU``W h''J]XYc'DfcXi Wfjcb'U``ck g'mci 'hc di h']bhc'dfUWfjWr'gca Y'cZh\Y'h\Ycf]Yg'UbX'WcbW'dhi U``a UhYf]U'g'h\Uhmci '\Uj Y'Wcj YfYX']b'mci f'dfYWYX]b[ghi X]Yg'''Nci 'k]``\Uj Y'h\Y'cddcfhi b]hmhc'WfYUHY'U'fUb[Y'cZg\cfhi]XYc'k cf_g'k]h\'Ub'Ya d\Ug]g'cb WcbW'dhi U``]bbcj Uhjcb'''Nci 'UfY'YbWci fU[YX'hc'`cc_'Zcf'dfUWfjWJ'`gc'i hjcbg'hc'h\YcfYhjWJ'`dfcV'Ya g WcbWfb]b['Z]`a #]XYc'h\Uhmci 'a Um\Uj Y'YbWci bHYfYX'Xi f]b['mci f'Z]`a 'UbX'a YX]JU'Wci fgYg'''Nci 'k]``VY]bhfcXi WfX'hc'h\Y'VUg]WhYW\b]WJ``g_]``g'cZcdYfUhjb['U'WJa YfUz`][\hjb[z'gWf]dhjb[z'dfY!dfcXi Wfjcb'd`Ubb]b[z' YX]hjb['UbX'dfYgYbHJhjcb'''+\Y'Wci fgY''U]a g'hc']bWfYUgY'mci f'dfUWfjWJ'`_bck `YX[Y'UbX'Uk UfYbYgg'cZZ]`a 'Ub[i U[Yz'ghmYz'dfcWfggz'UbX'hYW\b]ei Y'Vmk UmcZwfUzhVUgYX'Z bWfjcbU'`k cf_g\cd'YI YfWjgYgz']bXYdYbXYbhUggYa V'mUbX'U'gi VghJbhjU''[fci d![YbYfUhYX'dfcXi Wfjcb'dfcWfgg'''+\Y'Wci fgY'YbWci fU[Yg Wc'`UVcfUhj] Y'k cf_]b['dfUWfjWg',c'U'dfcZYgg]cbU'`ghJbXUfX''

7 ci fgY @YUfb]b['Ci hWca Yg

- &" 5 bU`mgY`g\cfh'Z]`a g`!`h\Y]f`ck b`UbX`ch\Yfg`ZcW`g]b[`cb`ghfi WhifYž]XYUgž'hYW\b]ei Yž'ghcfmhY``]b[ž `][\h]b[ž'gci bX`UbX`YX]h]b[
- ' "8Ya cbghfuhY 'Ub 'Ui X]cj]gi U` WfYUh]j]hm'UbX XYj Y`cd 'Wf]h]WU` h\]b_]b['U`cb['k]h\ 'h\Y 'Uddfcdf]UhY q_]`q`cZYl dfYqq]cb
- $("8Yj Y`cd`g_]``g`UbX`glfUlY[]Yg`]b`d`Ubb]b[`UbX`l]a Y`cf[Ub]gUl]cb \\$
-) " 9I dfYggʻUʻXYYdYfʻi bXYfgHJbX]b[ˈcZgWfYYbʻWi`hi fYʻUbXʻ`Ub[i U[Yʻh\fci [\'dfUWf]WJ``UbXʻWfYUh]j Y Udd`]WJh]cb
- *" K cf_'Wc``UVcfUh| Y`mUbX'i bXYftU_Y'U'fUb[Y'cZWfYk 'fc`Yg'tc'U'dfcZYgg]cbU``gtUbXUfX
- +"BY[ch]UhY`YZZYWh]jY`m
- , " 9 | \]V]h'U'fUb[Y'cZg_]``g']b fYgYUfW\]b['UbX'XYj Y`cd]b['Ui X]cj]gi U``WcbWYdhg

HYUWX]b['GhfUhY[]Yg'

K \]`Y`h\Y`]bghfi Wcfg`Zcf`GWfYYb`DfcXi Whjcb`—fJ]XYc`DfcYWLfYWc[b]gY`h\Uhbch'U```ghi XYbhg`i bXYfhU_]b[h\]g`Wci fgY`k]```gYY_hc`k cf_]b`h\Y`Z]`a `UbX`a YX]U`]bXi ghf]Ygžh\]g`Wci fgY`g`ghfi Wi fYX`Ug`U`dfcXi Whjcb Wci fgY`k]h\`\][\``Yj Y``Yl dYWfUhjcbg`cZdfcZYgg]cbU``WcbXi WfzfcVi gh[fci d`XmbUa]Wgžcb[c]b[Zcfa Uhj Y ZYXVUW_UbX`U`gi ddcfhj Y`Ybj]fcba Ybh'Zcf`WfYUhj]mm'`A mhYUW\]b[`d\]`cgcd\m]g`hc`dfcj]XY`U```h\Y bYWfggUfma UhYf]U`gžYbj]fcba Ybh'UbX`ZJWj`]hUhjcb'hc`U``ck 'ghi XYbhg'hc`gc`j Y`dfcV`Ya g`]b`U`WfYUhj Y`UbX dfU[a UhjWa UbbYf''=YbWci fU[Y`gY`Z\XYhYfa]bUhjcb'UbX`bY[chjUhjcb'g_]``g`]b`dfcj]X]b[`gc`i hjcbg`Zcf dfU[a UhjWwcbg]XYfUhjcbg`h\Uhk]``]bj Uf]UV`m]a dUWicb'WfYUhj Y`XYWJg]cbg''H\]g`Wci fgY`XcYg`\Uj Y`\][\

fla Y XYa UbXgʻci fg]XYʻcZWUggʻfla Y UbXʻVi fik]fl\ ʻga Uffifla Y a UbU[Ya YbhU``ʻghi XYbfgʻ\Uj Y fl\ Y cddcffi b]mihcʻ[U]bʻj Uʻi UVʻYʻYI dYf]YbWʻgʻʻA mhYUW\]b[ʻghfUhY[m]gʻhcʻghfi Wfi fYʻUʻbi a VYfʻcZ_Ymg_]``g VUgYXʻYI YfW]gYgʻ]bʻh\YʻZ]fgh\UʻZcZh\YʻhYfa 'hc XYj Y`cdʻghi XYbhg' WfUZhg_]``gʻk]h\ ʻa cfYʻfla YʻUj U]`UVʻYʻh\Ub]bʻdfYj]ci gʻWci fgYgʻh\YfVmXYa UbX]b[ʻ\][\Yfʻei U`]mici hWca Ygʻʻ=gYY_ibc YbWci fU[Yʻghi XYbhWfYUflji]m UbXʻYb[U[Ya Ybhk]h\ W]bYa UflW\]ghcfmh\fci [\`fcVi gh[fci dʻWc``UVcfUflcbgʻhcʻdfcXi Wfʻk cf_cZUʻ\][\ ghUbXUfXʻh\Uh]gʻ]bhYbXYXʻhcʻVYʻgi VgYei YbhmdfYgYbhYXʻUhZ]a 'ZYghJi Uʻgʻʻ

H\]g`Wci fgY`]g`Z[fa `mg]h`UhYX`]b`U`\UbXg!cb`UddfcUW\`hc`gWfYYb`ghi X]Yg`VmYl d`cf]b[`U`fUb[Y`cZ dfcXi Wf]cb`UddfcUW\Yg`]b`h\Y`g\cfhža i `h]!d`UhZcfa `bUffUh]j Y`Zcfa Uh'``Ghi XYbhg`k\c`U]a `hc`Wcbh]bi Y`k]h\ h\Y`ghi XmcZZ]`a ža YX]U`UbX`Wca a i b]\WJnjcbgždUfh]W``Uf`mh\cgY`k]h\`U`gdY\WJU`]bhYfYgh]b`W``hi fU` fYdfYgYbhUh]cb`UbX`h\Y`ghi XmcZZ]`a `h\Ycfmžghm`Ygž[YbfYg`UbX`\]ghcfmk]```VYbYZ[hZfca `h\]g`Wci fgY"``H\Y \\cdot fgY`YbWci fU[Yg`Wc``UVcfUh]j Y`k cf_]b[`dfUWh]\W`g"`H\Y`YI YW h]cb`cZ\WfYk `fc`Yg`hc`U'dfcZ\ygg]cbU` ghUbXUfX`k]```VY`YI dYWWYX`Ug`U`a]b]a i a `UbX`k]```VY`Yj U`i UhYX`U`cb[`k]h\`h\Y`WcbWYdhi U``ei U`]\micZh\Y \ZbU``dfc`Y\WiUbX`h\Y`\WdU\W]\micZh\Y`\WfYk `hc`a U_Y`\W\Ub[Yg`Zfca `h\Y`fci [\`W\htc`h\Y`Z]bU``XfUZh``

5ggYgga Ybh

E Ud/W/ B da Vg Uf[a`;;;]g`U`h\]fX!mYUf`dfcXi Wf]cb`Wci fgY`h\Uh'U``ck g`mci `hc`di hi]bhc`dfUWf]W/`gca Y`cZh\Y h\Ycf]Yg`UbX`WcbW/dh`U``a UhYf]U`g`h\Uh'mci `\Uj Y`Wcj YfYX`]b`mci f`dfYW/X]b[`gh`X]Yg"`H\Y`cbi g`]g`cb`mci hc`Z]bX`h\Y`f][\h'VU`UbW/`VYlk YYb`Z]`a `h\Ycfm'UbX`h\Y`XYa UbXg`cZg\cfh'Z]`a `dfcXi Wf]cb"

H\Y'ZcW g'cZh\Y'Wci fgY']g'cb'dfcXi W]b['bUffUh]j Y'k cf_g'k]h\'Ub'Ya d\Ug]g'cb'WcbWdh U`']bbcj Uh]cb'UbX hYWkb]WJ`Yl dYf]a YbhUh]cb''Mci 'UfY'YbWci fU[YX'hc''cc_'Zcf'dfUW]WJ`'gc'i h]cbg'hc'h\YcfYh]WJ`'dfcV'Ya g WcbWfb]b['Z]a #]XYc'h\Uhmci 'a Um\Uj Y'YbWci bhYfYX'Xi f]b['mci f'Z]`a 'UbX'a YX]U'Wci fgYg''-\(\partial h\Y'\Zffghig]] k YY_gž'mci f'dfcXi Wf]cb'g_]``g'k]```VY'XYj Y`cdYX'UbX'W\U``Yb[YX'h\fci [\'U'fUb[Y'cZhYW\b]WJ'`Yl YfW]gYg UbX'U'gYf]Yg'cZcVghfi Wf]cbg'''Nci 'k]```VY'U'gc fYei]fYX'hc'XYj Y`cd'h\Y'gWf]dhUbX'dfY!dfcXi Wf]cb'a UhYf]U'Zcf'mci f'a U'cf'dfc'YWf'''H\YgY'Z]`a g'k]``h\Yb'VY'W fUhYX'UbX'dfc[fUa a YX'VmU'ghi XYbhigi V!Wca a]hYY'Zcf U'gdYW]U`'gWfYYb]b['Uhh\Y'YbX'cZgYa YghYf'h\Uh]g'cdYb'hc'h\Y'di V`]WUbX']g'U'k cbXYfZ ``cddcfhi b]hmZcf mci 'hc'dfYgYbhmci 'k cf_'hc'mci f'ZJa]`mž'Zf]YbXg'UbX'mci f'WJghUbX'WfYk''

±0.1h\Y``YWi fYg`h\Y`gWfYYb]b['cZU'fUb[Y'cZg\cfh'Z]\W]cb'Z]`a g'k]```]blfcXi WY`mci 'hc'h\Y`UfhcZh\Y`g\cfh'Z]`a "Mci 'k]```VY`YbWci fU[YX'hc'Wf]h]\W\``mYj U`i UhY'h\YgY`Z]`a gž'mci f'ck b'k cf_'UbX'h\Y'k cf_'cZch\Yfg'UbX'hc h'ghh\YcfYh]\W\``dcg]h]cbg'k]h\`WYUh]j Y`gc`i h]cbg'UbX'dfUW]\W\``YI Yf\\]gYg"

Mci k]```VY`]blfcXi WYX`hc`h\Y`VUg]WhYW\b]WD``g_]``g`cZcdYfUh]b[`'U`WJa YfUž``][\h]b[ž'gWf]dh]b[ž'dfY!dfcXi Wf]cb`d`Ubb]b[ž'YX]h]b[`'UbX`dfYgYbhJh]cb"'H\Y`Wci fgY`U]a g`hc`]bWfYUgY`mci f`dfUWf]WD``_bck`YX[Y`UbX Uk UfYbYgg`cZZ]`a ``Ub[i U[Yž'ghmYž'dfcWfggž'UbX`hYW\b]ei Y`Vmk UmcZWfUZhVUgYX`Z bWf]cbU``k cf_g\cd YI YfW]gYgž']bXYdYbXYbhUggYa V`mUbX`U`gi VgHJbh]U``[fci d![YbYfUhYX'dfcXi Wf]cb'dfcWfgg"

E Udww B da Vg Uf[a`;;;] bffc Xi W g ghi XY bhg hc XY j Y`cd] b [ž f Yg Y Uf W] b [ž W Y Uh] b ['Ub X' W] f W `Uh] b ['g \cfh g W Y Y b! V Ug Y Xž `ck ! V i X [Yhž X] [] h U `b Uf f Uh] j Yg "= h U] a g hc `XY j Y`cd h Y `W Y Uh] j Y d f c W gg "Ub X hc 'Y I d`cfY h Y k Umg] b k \] W [] XY Ug a Um V Y 'h Ubg`Uh Y X'] b hc ghc f] Y g ž] a U [Yg `Ub X gc i b X h f c i [\ g W f] dh k f] h b [`Ub X Y X] h b [YU Y W] g Y `Ub X j Uf] c i g d f c X i W g " H \ Y `W t i f g Y Y b W c i f U [Yg `W c ``UV c f Uh] Y 'k c f _] b ['d f U W] W g " H \ Y Y I Y W h c c Z W Y k 'f c `Yg hc 'U'd f c Z Y g g | c b U `g h b X Uf X k] `` V Y Y I d Y W Y X 'Ug 'U a] b] a i a `Ub X k] `` V Y Y j U`i Uh Y X U`cb ['k] h `h Y `W b W d h U`e i U`] h m c Z h Y `Z b U `d f c Y W i Ub X 'h Y `W U d U W] m c Z h Y `W Y k 'h c a U _Y `W Ub [Yg Z f c a h Y 'f c i [\ W h h c h Y `Z] b U `X f U Z h

Gi Va]gg]cb ghfUhY[m

#DicfXYfire i]blfcXi WY [fYUhYfiWe``UVcfUh]cb'UbX:X]gW gg]cbz'gUj YidudYfz'fYXi WY WI hHYfiUbX:WfYUhYiUa cfY]a a YX]UhYiWea a i b]WUhji YiYbj]fcba Ybhz'U``igi Va]gg]cbg'bYYXihcifYg]XYicbimci fidefhze`]cik YVg]hY''i7 fYUhYimci fick bicb`]bYidefhze`]cig]hYifh]gi]giYUgmz\WYUd UbX:g\ciiX;hU_Y``Yggih\Ubi\Ubi\ciifz\UbX:WfYUhYigYdUfUhYgYwl]cbg'Zefimci fiYl Yfw]gYgz\Wf]h]ei YiUbXig\cfhZ]a idfcXi Wf]cbg''i5j c]XiV\c[fc``idfYgYbhUh]cbg''iVci fig]hYg\ciiXiVY\WYUfim]XYbh]Z]UV`YiUgimci fg''iVci iUfYiYbWzi fU[YXihciWXYW_ici himci fiWzi`YU[i Yg'ig]hYg''iGi Va]himci fiUggYgga YbhgicbiA ccX`Yig]a dimVmdfYgYbh]b[iUig]b[`Yig\YYhcZdUdYfik]h\hYidefhze`]ci UXXfYggiZefih\YigdYwYlYfWgYiU`cb[ik]h\wf]h\Wb`Wa a YbhUfmUbXigY`ZUbXidYYffYj]Yk gi]bih\YiWugYicZ[fci dik cf_"DiYUgY'U`gcigYbXimci fihi hcf'UbiYa U]`icbWimci i\Uj YiWa diYhYXimci fiYbhfmigcih\Uhih\Ym\Uj Yi`]ghicZU``ghi XYbhg'ik YVg]hYg''Mci a Umu`gciVYifYei]fYXihcigi Va]hfkUfXiWcd]YgficZmci fik cf_'VYi]hcbidUdYfzii gVicfigca Yich\YfiZefa UhigciYbgi fYih\Uhimci iUfW\]j YiYZZYWhj Yim'

5 hry b X U b W

 $\label{eq:continuous} C k \]b[\ 'hc'h\ Y'b Uhi f Y'c Zh\ Y'dfc Xi Wh]cb'dfc Wrggž`UhY'Uff]j U`g'UbX'YUfmXYdUfhi f Yg'k \]```B C H'VY'UVWrdhYX'' Mci 'A I GH'VY'UV`Y'hc'UhhYbX'U```gW\ YXi `YX'k cf_g\cdg'UbX'[fci d'a YYh]b[g''`A U_Y'UffUb[Ya Ybhg'B C K ']b cfXYf'hc'Xc'gc'—'mci 'k \]```VY'j YfmVi gmi]b'A UfW\ ž'5 df]``UbX'A Um''`Mci 'WUbbchWca d'YhY'h\]g'Wci fgY'k]h\ci h di bWh U`]mz'cf[Ub]gUh]cb'UbX'U'dfcZYgg]cbU``Uh]h XY'k]h\ 'U`\][\ 'Wca a]ha Ybhhc'mci f'gUZYhmUbX'h\ Y$

gUZYmiUbX'k Y``!VY]b['cZmci f'Wc``YU[i Yg"'J]XYc'dfcXi Wjcb']g'U'Wc``UVcfUhjj Y'dfcWrgg'UbX']hi]g'YggYbhjU` h\Uhmci 'UfY'di bWh U`žfY`]UV`Y'UbX'a U]bhU]b'U`\][\``YjY``cZ[fci d'fYgdcbg]V]`]hm''@UhYbYgg'cf'UVgYbWk Zfca 'k cf_g\cdg'UbX'`YWfi fYg'k]``i bXYfa]bY'mci f'dcg]f]cb']b'f\Y'Wca a i b]mcZZ[`a a U_Yfg"'5VgYbWf'cf HUfX]bYgg^]b^UthYbX]b[dfcXi Whjcb^[fci daa YYh]b[gaa UmfYgi h]b^Yl di hg]cb^Zfca hhY^[fci dak]hh gi VgYei Ybh UggYgga YbhdYbU'h]Yg'f]Y"'mci 'a UmZJ]`'h\]g'Wca dcbYbhcZh\Y'Wci fgYŁ"'5g'U'dfcXi Wf]cb'i b]hž'GWfYYb DfcXi Wjcb =]g U ja Y]bhYbg]j Y Wci fgY" H\YfY]g Ub Uggi a dhjcb h\Uha Ubmk cf_g\cd Yl YfWjgYg UbX $\label{thm:conditional} \verb|WU^*g_]``g'k]```VY'Wcad`YhYX'cf'XYjY`cdYX'cihg]XY'cZWUgg'h]aY'''GWfYYb'DfcXiWf]cb''==WcifgY'''.$ Uggi a Yg'h\Ungh XYbhg'k]``]bj Yghg][b]Z\WbhYbYf[mUbX'h]a Y'ci hg]XY'cZh\Y'U``c\WhX'WUggYg'hc'k cf_]b[cb'h\Y]f'Wc``UVcfUhjj Y'dfcXi Whjcbg"'=hi]g'i d'hc'h\Y'[fci dg'hc'bY[ch]UhY'a YYh]b['UbX'k cf_]b['h]a Yg" Gh XYbhg k]``VY`UggYggYX`cb`h\Y]f``Yj Y``cZ[fcid'dUfh]W]dUh]cb`Ug`kY```Ug`cb`h\Y``Yj Y``cZdUfh]W]dUh]cb`h\Ym X]gd`Umi]b`k cf_g\cd`Yl YfW]gYg`UbX`X]gW gg]cbg"`Zmci `UfY`UVgYbhmci `a i ghdfcj]XY`U`[ccX`fYUgcb VUW_YX`i d`VmXcW`a YbhUh]cb"`H\]g`Wca a]ha Ybh]g`bYWrggUfmhc`]bgh]```U`g]a]`Uf`W``hi fY`hc`h\Y`dfcZYgg]cbU` Zja 'UbX'a YX]U']bXi glfmik \YfY'di bWi U`]lmiUbX'dfYdUfUljcb'df]cf'lc''WU``'lja Y']g'Z bXUa YbHJ`'Ug']g $fYgdcbg]V]`]hmhc`mci f`hYUa `a Ya VYfg`UbX`k \YfY`h\Y``k cf_'`]g`U`k Umg`UVcj Y`dYfgcbU``]ggi Yg`UbX`gcfh]b[$ ci hWfYUhjj Y'X]gU[fYYa Ybhg']g'dUfhicZh\Y'dfcWfgg"'+b'cfXYf'hc'UW\]Yj Y'cdhja U''ci hWca Ygžmci 'k]``bYYX'hc HU_Y`Ub`UWIj Y`UbX`fYgdcbg]V`Y`dUfh`]b`k cf_g\cd`X]gW gg]cbgž'Wc``UVcfUlfj Y`dfc^YWg`UbX`ch\Yf`UggcW]UhYX UWNj jhyg"5acb['h\Y'Wf]hyf]U'Zcf'UggYgg]b['h\Y'eiU']hmcZmcif'UWNj Y'Yb[U[YaYbh'UfY.FYgdcbgYg'hc'h\Y $[XYUg'X]gW'ggYX']b'h'Y'k cf_g'cdg'UbX'gWfYYb]b[g$

5 Whj Y 'Wc``UVcfUhjcb`k]h\ 'mci f`Wc``YU[i Yg`cb`[fci d`k cf_'k \YfY`ck bYfg\]d`cZWfYUhj Y 'WcbhYbh]g`g\UfYX

7 fYUhjj Y'gc'i hjcbg'hc'k cf_g\cdg'Yl YfWjgYg

5 MY b X U b V W ' U b X ' di b W i U '] m

DfcZYgg]cbU``Uhn]hi XY

5V]`]hmihc'hfubg`uhY'ZYYXVuW_'ubX']bWcfdcfuhY']bhc'mcif'k.cf_

7c``UVcfUhcb

5 "gh XYbhg k] "VY Ug_YX hc gY Zcf[Ub]gY]bhc [fci dg cZh\fYY hc Zj Y Uhj Uf]ci g ghU[Yg cZh\Y k cf_g\cd dfcWrgg":8if]b['h\Y'WcifgYzghiXYbhg'k]``VY'Ug_YX'hc'Wcbhf]VihY'hc'h\Y'[fcid'dfc'YWhVmdYf7cfa]b[gdYWJZJWfc`Yg`fY`UhYX`hc`WUa YfUžgci bXžYXJhJb[ždfcXi WJb['UbX'X]fYWJb["J]XYc`dfcXi WJcbg'UfY Wc``UVcfUhjj Y`dfcW/ggYg`UbX`]h]g`]a dcffUbhih\Uhmci XYj Y`cd`h\Y`bYW/ggUfmg_]``g`Zcf`YZZYWhjj Y`hYUa k cf_ž Wea a i b]WUIJcb UbX WebZ]WifYge i IJcb "+i]g YggYbIJU ih Uhmei UlHYbX U ih Y d Ubb]b[žX]gW gg]cb UbX dfY! dfcXi Wjcb'a YYhjb[g'h\Uhmci 'UffUb[Y'Ug'U'[fci d"'H\Y'Zcfa U''F YgcbUbWY'A YYhjb[']g'U'dfY!dfcXi Wjcb dfcW/gg/h\Uh]g'U'Wci fgY'fYei]fYa YbhUbX'k]``bYW/gg]hUhY'U'gdYWJU`a YYhJb['UffUb[Ya Ybhk]h\'mci f'[fci d UbX'mci f'h hcf" ±h]g'h\Y'fYgdcbg]V]`]hmcZh\Y'[fci d'hc'UffUb[Y'h\]g'k]h\ mci f'h hcf" =ZWca a i b]WUh]cbg'VfYU_ Xck b k]h]b h Y [fci dž]h]g i d hc h Y [fci d hc z]b X u gc i h]cb hc a Y X]UhY h]g dfc W gg]b c f X Y f hc u W]Y j Y u k cf_]b['ci h/ca Y" +i]g']a dcfh/bhih\uhih\Y'[fci d'bch]Zmih\Y]f'h hcf'cf' wci fgY wcbj Ybcf'cZgi W WjfW a glUbWrg UbX fYei YghUgg]glUbWr]b U a YX]Uljcb dfc Wrgg" I `hja Uly`mih\Y ZjbU`dfc YWijg U [fci d $Yl YfW]gY"'H\Y']bhYfYghg`cZh\Y'[fcid`UbX'h\Y'dfcYWhk]``VY'd`UWYX'UVcjY']bX]j]Xi U``UYgh\Yh]WXYg]fYg"$ H\]g^]g^Ub^cddcffi b]lm^Zcf^U^``dUffjWjdUblg^hc^XYj Y^cd^h\Y^gi VhY^g_]^g^cZbY[cfjUhjcb^UbX^WfYUhjj Y dYfgi Ug]cb'UbX'fc'VY'UV'Y'fc''Yh[c'cZ]XYUg'YUg]`mk\]'Y'a U]bHU]b]b['U'h][\h'ZcW'g'cb'h\Y'WcbW'dh' FY[i`Uf'UbX'cb[c]b[']bXYdYbXYbhghXmžfYUX]b[ž'bchY!hU_]b[ž'gWf]VV`]b['UbX'WcbWYdh'U`]g]b['UfY YggYbhJU`Wca dcbYbhg`cZh\]g`Wci fgY"'H\]g`]g`U'Wci fgY']b'WfYuhJj]lmUbX'h\]g`fYei]fYg`X]gWJd`]bY'UbX YghUV`]g\]b['U'f][cfci g']a U[]bUh]j Y'dfUWfW"']h]g'Ub'Yl dYWUh]cb'h\Uhih\Y'gh XYbhg'k]``'WcbXi Whh\Y]f'ck b fYgYUfWX VUgYX cb _bck YX[Y [U]bYX]b :]a Gh X]Yg" Mci UfY YI dYWYX hc VYWca Y ZJa]`]Uf k]h h Y \text{hyvxb]wu\cdotwruhj y\kf]h\b[g\]b\h\\\Z]\cdot\h\fci [\\fY\Yj UbhfYUX]b[g\UbX\j Uf]ci g\cb\]b\cfX\f hc h\]b_'UVci hih\Y'gdYV]ZJWWfUZng_]``X]gW ggYX'UbX'gHJfhih\]b_]b['cZ\ck 'mci 'k ci 'X'UXUdhih\]g'hc 'mci f

WfYUhji Y'dfc YWfi'H\Y'YbX'cZgYgg]cb'gWfYYb]b['k]``fYei]fY'j c`i bhUfmUgg]ghUbWfhc'a U_Y'h\Y'Yj Yb]b['U\i [Y'gi WWfgg"'K Y'k]``bYYX'h\Y'dcghdfcXi Wfjcb'hYUa 'hc'dfcXi Wfh\Y'Yj Ybhž'U'a Uf_Yh]b['hYUa 'hc [YbYfUhY'Ub'Y!ZmYfhc'X]ghf]Vi hY'hc'mci f'[i Yghg'UbX'fU]gY'h\Y'dfcZ]'Y'cZh\Y'Yj Ybhk]h\ 'Zc``ck 'i d'X]ghf]Vi hJcb cZ]bX]j [Xi U``Z]'a g'hc'j Uf]ci g'ZYghji U`g'UbX'Z]'a 'Wca dYhJhJcbg/hYW\b]WJUbg'hc'cdYfUhY'h\Y'dfcYWhcf'UbX'U WfYUhji Y'hYUa 'hc'WccfX]bUhY'h\Y'Yj Yb]b['k]h\`Ub'A 7 'hc'[i]XY'h\Y'Ui X]YbWf"'H\]g']g'mci f'b][\h'hc'g\]bY UbX'gi ddcfhmci f'Wc`YU[i Yg"

5ggYgga YbhHUg_g

5ggYgga Ybh'hJg_	K Y][\h	8i Y'8UHY	Gh XYbh@YUfb]b[Ci hWca Yg 5ggYggYX
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±b!WUggʻdfcXiW¶cb YIYfW]gYgʻ	' \$1	%+#\$(#&\$&\$`\$(.\$\$`DA	%ž&Ž ž* ž+ž,
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@Yb[h\. i d'hc'' a]bg'UbX'bc'a cfY'h\Ub'U'%\$\$\$'k cfXg'cZgi ddcfh]b['XcW a YbhUh]cb

8YHJ]`g. `G]b[`Y``c\Wh]cb`Z[`a #g\WbY`f]bX]j]Xi U``UbX`[fci d\eb!\WUgg`g\\\YYb]b[`UbX`@A G`ZYYX\VU_``

5XX]h]cbU`XYhU]`g.

H\]g'UggYgga YbhiUg_']g'XYg][bYX'Ug'Ub'cddcffi b]mUg'U'dfcc2c2WbWWdh2cf'mci f'ZbU''dfc YWh'tc'hYghU gWWbY'2ca 'mci f'gWf]dhigYhUhcbY'cWlhjcb'UbX'tc'VY'2]a YX'cj Yf'cb'mcbY'2]a]b['XUm''Mci 'UfY YbWci fU[YX'tc'k cf_'2fca 'mci f'gWf]dhi h]']g]b['U'g]b['Y'cWlhjcb'h\UhA 5M2YX']btc'mci f'ZbU''[fci d'dfc YW'' K cf_]b[']b'U'hYUa 'cZh\fYYz'mci 'k]'''a U_Y'Ug\cfh' !a]bi hY'gHbX!U'cbY'2]a "'Ghi XYbhg'k]'''fYWY]j Y Wcbgi 'hUhjcb'UbX'2cfa Uhjj Y'2YYXVUW_Xi f]b['h\Y'dfcWygg'cZdfc YWhXYj Y'cda Ybh'' K f]hhYb'2YYXVUW_k]'''VY dfcj]XYX'U2hYf'gi Va]gg]cb''5XX]hjcbU''XYhU]'g. 'Mci 'k]'''WYUHY'U'h\fYY!a]bi hY'2]a 'k cf_]b[']b'ga U'''HYUa g cZh\fYY'UhU'g]b['Y''cWlhjcb'ffc'Uj c]X''c[]gh]Vg']ggi Ygt'''H\]g'wci 'X'VY'Y]h\Yf'h\fYY']bX]j]Xi U'z'cbY'a]bi hY'2]a gz'k]h\Y'UW\f [fci d'a Ya VYf'fchUh]b['h\fci [\h\Y'_YmWfYk 'fc'Yg' fl\fk't f]hYf!X]fYWcf!YX]hcf'f&t WhYa Uhc[fUd\Yf'fl t'gci bX'''''''C f'U'g]b['Y'h\fYY!a]bi hY'2]a 'k]h\'WYk 'a Ya VYfg'a U]brU]b]b['h\Y]f'fc'Yg h\fci [\ci hh\Y'dfc YWh'H\]g']g'Ub'cddcfhi b]mhc'XYj Y'cd'mci f']XYUg'cf'WbWydg']b'U'ga U"Yfz'2YYYfz'a cfY]a dfcj]gYX'2cfa Uhhc'2YYX']bhc'mci f'2]bU''dfc YWh'Yi's 'hYfbUhjj Y'mz'h\YgY'2]a g Xc'bchbYWygUf]m\Uj Y'hc \Uj Y'U'WcbbYWnjcb'hc'mci f'2]bU''dfc YWhz'Vi hk]'''dfcj]XY'mci k]h\'h\Y'cddcfhi b]mhc'XYj Y'cd'mci f'g_]"g']b |a dUWhjb['Ub'Ui X]YbW'''H\]g']g'Ub'YlYwyy'lb' wyYlhjb['U'ga ghU]bYX'a ccX'k \YfY'h\Y'cWiflob'UWg'Ug'U \W\UfUWhYf'''H\Y'2cW'g']g'cb'WYUf']XYUg'zga UfhYb[U[Ya YbhUbX'h\Y'g]b['Y'cWhjcb'Wbgb'Ub'X'flob'Wbg'Ug'U \W\UfUWhYf'''H\Y'2cW'g']g'cb'WYUf']XYUg'zga UfhYb[U[Ya YbhUbX'h\Y'g]b['Y'cWhjcb'Wbg'Uhjbc'YZYWhjj Y [fci d'Wc''UVcfUhjcb'UbX'f][cfci g'dfY!dfcXi Whjcb']b'dfYdUfUhjcb'Zcf'mci f'a U'cf'dfc'YWh'

5ggYgga YbhWf]hYf]U.

*bj Ybhjj Yž'cf][]bU``UbX'fcVi ghYb[U[Ya Ybhk]h\]XYUg

F YgdcbgY hc '_Ymh\Ya Y

9 ZZYWNji Y dyfzcfa UbWY czwyk fc Yfgł

9a chcbu`la dUWicZZia fot

7 `YUf`XfUa UhjWglfi Wi fY`UbX`bUffUhjj Y`XYj Y`cda Ybh

Cf][]bU`fYgdcbgY hc ghmY UbX ghfi WhifY

5ddfcdf]UhY dfY!dfcXi Wgcb XcW a YbrUhcb / dfcWrgg

5dd`]WUhcbcZhYW\b]WU`q_]``q'UbX'dfcZlWYbhi qYcZYei]da Ybh

@|b_|b['j]gi U``UbX`Ui fU``V\\c]\\\'g`k]h\`h\YcfYh]\\U``UbX`\\f]h]\\U``_bck`YX[Y'/ 'fYgYUf\\\

7 `Uf]lmicZ]bh/bh/cb 'Ug'gi VghUbh|Uh/X Vmgi ddcfh|b['k f]lhh/b Wca a YbhUfm

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K \]`Y`h\Y`c\Z]WJU``gi Va]gg]cb`XUm]g`&+`A UfW\ž`k Y`k]```VY``cc_]b[`Uhimci f`Z]`a g`]b`WUgg`h\Uhk YY_`f&)! &+h\`A UfW\Łk]h\`]a a YX]UhY`Zcfa Uh]; Y`ZYYXVUW_`dfcj]XYX`hc`YUW\`qhi XYbh'UbX`Wc``YW¶; Y`mhc`[fci dg''``

`D`YUgY``cUX`U``]b_'hc`Y]h\Yf`mci f`dcfh⁄z`]c`g]hY`cf`U`J]a Yc`cf`Mci hi VY`g]hY`Zcf`mci f`Z]`a `k]h\`WfYX]hg`UbX`U Vf]YZgi a a UfmcZmci f`Z]`a .`%\$\$`k cfXg"`=Zmci `k cf_YX`YI d`]Wh`mUg`U`hYUa `cZhk c`cf`h\fYY`cf`Zci f`dYcd`Y`! d`YUgY`a U_Y`h\Y`k cf_]b[`a Yh\cX`UbX`Wc``UVcfUh]cb`YI d`]Wh`]b`mci f`gi ddcfhXcW a YbhUh]cb"`D`YUgY gi Va]hdYYf`UbX`gY`ZfYj]Yk `Zcfa g`hc`Ybgi fY`Yei]hm`]b`a Uf_]b["

Gi Va]gg]cb'bchYg.'d`YUgY'gi Va]hcb'A ccX`Y'UbX'cb'mci f'dcfh7c`]c'k YVg]hY"'DUghY'h\Y'J]a Yc'`]b_'hc'mci f Zja 'cb'h\Y'Uddfcdf]UhY'gi Va]gg]cb'gYWfjcb']b'A ccX`Y

Gi Va]gg]cb bch/g. D`YUgY gi Va]h`U``]b_'hc 'mci f'j]XYc '\cgh/X'cb 'U'j]XYc 'g\Uf]b['g]hY 'hc 'A ccX`Y 'fUbX mci f'dcfh⁄c`]cŁ'U`cb['k]h\ 'U'Vf]YZWf]h\WJ`'UbU`mg]g'UbX'dYYf'UbX'gY`ZfYj]Yk 'cZmci f'WfYk 'fc`Y'dYf⁄cfa UbW

Hi fb]hjb gYhjb[. H\]g]g bchU Hi fb]hjb Ugg][ba Ybh

5qqYqqa Ybh& 10!WUqq dfcXi Whcb Yl YfWqYq

GhUfhXUhY. Bch5dd`]WUV`Y

@Yb[h\.') 'dfcXi Wgcb'Yl YfWgYg'UbX'UWWca dUbmb['k f]hhYb'Wca a YbhUfm

8YHU]`q. :]j Y]b! WUqq dfcXi Wqcb YI YfWqYq f[bX]j]Xi U`UbX [fci dl@A G : YYXVUW_

5XX]h]cbU`XYhU]`g.

:]i Y]b!WUqq dfcXi Whcb YI YfWqYq flbX]i]Xi U`UbX [fci dŁ

 $\label{eq:def-problem} Dfc YW g'k] ``VY'W caa YbW X'] b'WUgg z'c ZHY b'Ug' [fcid Yl YfW] g Yg'UbX'b YYX'hc'VY'W caa YbW X'] b'WUgg z'c ZHY b'Ug' [fcid Yl YfW] g Yg'UbX'b YYX'hc'VY'W caa YbW X'] b'WUgg z'c ZHY b'Ug' [fcid Yl YfW] g Yg'UbX'b YYX'hc'VY'W caaa YbW X'] b'WUgg z'c ZHY b'Ug' [fcid Yl YfW] g Yg'UbX'b YYX'hc'VY'W caaa YbW X'] b'WUgg z'c ZHY b'Ug' [fcid Yl YfW] g Yg'UbX'b YYX'hc'VY'W caaa YbW X'] b'WUgg z'c ZHY b'Ug' [fcid Yl YfW] g Yg'UbX'b YYX'hc'VY'W caaa YbW X'] b'WUgg z'c ZHY b'Ug' [fcid Yl YfW] g Yg'UbX'b YYX'hc'VY'W caaa YbW X'] b'WUgg z'c ZHY b'Ug' [fcid Yl YfW] g Yg'UbX'b YYX'hc'VY'W caaa' YbW X'Zcf'gi Vaa] g g Jcb d'Jch' x'Y WUgg z'c ZHY b'Ug' [fcid Yl YfW] g Yg'UbX'b YYX'hc'VY'W caaa' YbW X'Zcf'gi Vaa] g g Jcb d'Jch' x'Y WUgg z'c ZHY b'Ug' [fcid Yl YfW] g Yg'UbX'b YYX'hc'VY'W caaa' YbW X'Zcf'gi Vaaaa' YbW X'Zcf'gi$

 $\label{thm:converse} \mbox{H\Y'dfc'YWg'bYYX'hc'VY``cUXYX'cb'hc'mcif'ckb''dcfhzc`]c'g]hY']b'U'WYUf'miaUf_YX'gYWf]cb'''Dfc'YWg'k]```VY'' and the second converse of the conver$

5XX]h]cbU`'XYhU]`g.

c c ck b [h Y D]hW b [czmci f dfc Y W f [fci dg k] VY gY Y W Y X cf_b [lb ga U dfc X W fc f dg f mci k] VY U c W Y X U w Y k fc Y U b X f Y ei] f Y X hc k cf_ W c U V c f U h j Y m hc X Y j] g Y ž f Y g Y U f W ž d U b ž g \ c h U b X Y X | h U b U f U h j Y m V U g Y X hc w a d Y h Y U) \$\$ k c f X g Y Z Y j U i U h j c b Z c fa U b X U d Y Y f f Y j] Y k Z c fa U h h Y w a d Y h j c b c Z h Y d f c Y w U g k Y U u j b X j j] X i U m k f] h Y d f c Y W f Y d c f h Y d f c Y W f Y d c f h Y d f c Y W f Y d f c

:]`a 'H\Ya Y. 'HC '69 '897 €98 '₺ 'K 99? '%

5 XX]h]cbU``XYhJ]`g. `Ga U```dfcXi Wf]cb'[fci dg'k]```VY'gY`YWhX'hc XYj Y`cd'U'gWf]dhiZcf'dfcXi Wf]cb'h\Uh YI Ua]bYg'h\Y Wti fgY'h\Ya Y'fhc'VY'X]gW ggYX']b'WUggŁ"'Mci 'UfY'YbWti fU[YX'hc'k cf_'k]h\'U'gWf]dhik f]hhYb Ug'dUfhcZh\Y'gWf]dhik f]hjb['Wti fgY'cf'Ub'UXUdhUh]cb'cZUb'YI]gh]b['`]hYfUfmk cf_"'Mci 'a Um'W\Ub[Y'cf'UXUdh h\]g'gWf]dhik fYgdcbX'hc'dfcXi Wf]cb'fYei]fYa Ybhg"'Mci 'a Um'UXX'a cfY'X]U'c[i Y']ZfYei]fYX"'7 fYk 'fc'Yg'k]`` VY'U``cWUhYX'UbX'mci 'k]```VY'fYei]fYX'hc'k cf_'Wt```UVcfUh]j Y`mhc'XYj]gYžfYgYUfW\ž'd`Ubžg\cchž'UbX'YX]h mci f'bUffUh]j Y'fa UI]a i a ``Yb[h\'+a]bi hYgŁ"'Mci 'k]```VY'YI dYWhYX'hc'Udd`mU``'h\Y'hYW\b]WU`'UbX h\YcfYh]WU`'_bck `YX[Y'h\Uhmci '\Uj Y'`YUfbhXi f]b['mci f'Z]`a 'ghi X]Yg"''Mci 'k]``VY'U``cWUhYX'hc'U'[fci d UWWtfX]b['hc'mci f'dfYZyffYX'WfYk 'fc'Yg'UbX'mci f'dfYZyfYbW''Zcf'U'gdYW]ZWdfc'YWf''±i]g'YggYbh]U`'h\Uhmci ghUfh[YbYfUh]b[']XYUg'Zfca 'K YY_'C bY'UbX'Wta a i b]WUh]b['h\Ya 'hc'mci f'k cf_g\cd'[fci d'gc'h\Uhih\Y a cghYb[U[]b['dfc'YWg'WUbVY'gy'YWhYX'UbX'a UXY''

Mci f'a Uf_'k]``VY'a UXY'i d'cZh\Y'Yj U`i Uh]cb'cZmci f'Z]`a ž'mci f'Wf]h]WU``UbU`mg]g'cZmci f'Z]`a 'UbX'mci f dYfZcfa UbW'cZmci f'XYg][bUhYX'WfYk'fc`Y"'

5 'ei U']mmW hcZmci f'Zj'a 'bYYXg'hc'VY'dfYgYbHYX'hc'h\Y'W fUhcf]U'hYUa 'Vm'&da ': f]XUm'&('5df]"'Mci f'h hcf a i ghg]hY'mci f'dfc'YWi]b'h\Y'Z]bU'k YY_hc'dfcj]XY'mci 'k]h\'Z]bY'W hUbX'Wc'ci f'[fUX]b['UbX'gci bX'a]l]b[ZYYXVUW_VYZcfY'mci f'Z]bU'gi Va]qq]cb'UbX'h\Y'di V`]WdfYqYbHJhcb'cb'&, '5df]'

Gi Va]gg]cb'bchYg.D`YUgY'gi Va]hj]U'A ccX`Y'U``]b_'hc'mci f'Z]`a 'U`cb['k]h\'U'Vf]YZWf]h]WU``UbU`mg]g'cZmci f dfc'YWhf) \$\$'k cfXqŁ'UbX'U'dYYf'UbX'qY'ZfYj]Yk 'cZmci f'WfYk 'fc'Y

Hi fb]hjb gYhjb[. H\]g]g bchU Hi fb]hjb Ugg][ba Ybh

5 https://bxubwww.fyei.jfya.ybhg

Ck]b['hc'h\Y'bUhi fY'cZh\Y'dfcXi Wijcb'dfcWiggž`UhY'Uff]j U`g'UbX'YUfmXYdUfhi fYg'k]``BCH'VY'UWWdhYX"

Mci 'A I GH'VY'UV`Y'hc'UhiYbX'U```gW\YXi `YX'k cf_g\cdg'UbX'[fci d'a YYh]b[g"'A U_Y'UffUb[Ya Ybhg'BCK ']b

cfXYf'hc'Xc'gc'—'mci 'k]```VY'j YfmVi gm]b'5df]`'UbX'A Um''Mci 'WUbbchWca d'YhY'h\]g'Wci fgY'k]h\ci h

di bWi U`]mz'cf[Ub]nUhjcb'UbX'U'dfcZYgg]cbU``Uhhjhi XY'k]h\'U'\][\'Wca a]ha Ybhhc'mci f'gUZYhmUbX'h\Y

gUZYhmUbX'kY``!VY]b['cZmci f'Wc``YU[i Yg"'J]XYc'dfcXi Wijcb']g'U'Wc``UVcfUhj Y'dfcWygg'UbX']h]g'YggYbh]U`

h\Unmci 'UfY'di bWi U'z'fY`]UV'Y'UbX'a U]bhU]b'U'\][\'Yj Y``cZ[fci d'fYgdcbg]V]`]mh'@UhYbYgg'cf'UVgYbWi

Zfca 'k cf_g\cdg'UbX'`YWi fYg'k]``UhhfUWia Uf_]b['dYbU'h]Yg"'5VgYbW''cf'hUfX]bYgg']b'UhhYbX]b['dfcXi Wi]cb

[fci d'a YYh]b[g'a UmfYgi 'h]b'Yl di `g]cb'Zfca 'h\Y'[fci d'k]h\'gi VgYei YbhUggYgga YbhdYbU'h]Yg'f]Y'''mci

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	UbX:YI hYf]cf":Cb:h\Y:Zm58F"	

FYgci fWfg

DfYgWf]VYX F Ygci fWYg

A cgh'Wci fgY'fYgci fW'g'k]``VY'dcghYX'cb'U'kYY_`mVUg]g'cb'h\Y'A ccX`Y'g]hY'hc'gi ddcfh'mci f'Wci fgY Yl dYf]YbWY'''Gh XYbhg'UfY'Yl dYWYX'hc'fYj]Yk 'h\YgY'fYgci fW'g'h\cfci [\`m'

FYWca a YbXYX FYgci fWfg

 $\label{eq:def-def-def} $$ D'YUg'gYY'A ccX'Y'Wci fgY'g]hY'!'k YY_`mi dXUhYg$$

7ci fgY 9j U`i Uh]cb UbX 8Yj Y`cda Ybh

: 998657?

: YYXVUW_`]g`Ub`YggYbhJU``dUfhcZdfcXi WhJcb`UbX`WfYUhJj Y`dfcWfggYg"`Hi hcfg`k]```dfcj]XY`cb[c]b[`cfU``UbX Zcfa UhJj Y`ZYYXVUW_`Zcf`Wci fgY`a UhYf]U`g`]b`h\Y`dfcWfgg`UbX`dfYdUfUhJcb`cZmci f`dfc^YWfg`Vi hcb`m]Zmci

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

Hi fb]h]b Gi Va]gg]cb

#mci YbWci bhYf'U'dfcV'Ya 'k \Yb'UthYa dr]b['rc'gi Va]hmci f'Ugg][ba Ybht\fci [\'Hi fb]r]bž'd'YUgY
hY'Yd\cbY'9I hYfbU''Gi ddcfhcb'-',) '''' %cf'Ya U]''h\Ya 'cb'YI hYfbU'hY'hgi ddcfh4 i bgk "YXi "Ui '"'Gi ddcfh
\ci fg'UfY', .\$\$Ua '-'%\$.\$\$da 'cb'k YY_XUmg'UbX'-.\$\$Ua '-').\$\$da 'cb'k YY_YbXg'fl *) 'XUmg'U'mYUft\"'=\maintention
UfY'i bUV'Y 'rc'gi Va]hmci f'Ugg][ba YbhXi Y'rc'U'ZJi 'hk]h\'Hi fb]r]b'mci 'a Um'Udd'm\Zcf'Ub'YI hYbg]cb\ZVi hmci
a i ghfYhJ]b'mci f'r]\W_Yhbi a VYf'\Zfca '9I hYfbU''Gi ddcfhfU'cb['k]h\'Ubmch\Yf'fY'Yj UbhXcW a Ybfg\L'rc
]bWi XY'Ug'Yj]XYbW' 'rc'gi ddcfhmci f'YI hYbg]cb'Udd']\WJh]cb'''=\maintention
UfY'' bUYY''mfYWY']j Y'U'r]\W_Yhbi a VYf\Zfvi h]Zmci 'hY'Yd\cbY'mci 'k]'''bYYX'rc'gdYW]\ZfwJ''mUg_'Zcf'cbY''
Hi fb]h]b'U'gc'dfcj]XYg'i dXUhYg'cb'h\Y]f'gmghYa 'gfUh' g'cb'Hk]hYf"

; YbYfU``mž'UggYgga YbhiHug_g'a i ghVY'gi Va]hhYX'Y`YVWfcb]\W)``mj]U'Y]h\Yf'Hi fb]hjb'cf'U'A ccX`Y Ugg][ba Ybh'' =b']bgHJb\W'g'k \YfY'h\]g']g'bchdcgg]V`Yž']hk]``'VY'gHJhYX'cb'mci f'\\circ i fgY'g'A ccX`Y'g]hY'k]h\ U`hYfbUhj Y'gi Va]gg]cb'XYHJ]`g''

cfi]bZcfa Uh]cbicbi\ckihcigi Va]hUgg][ba Ybhgicbi]bYij]UiA ccXiY.i\hdg.#gh XYbh'i bgk "YXi "Ui #\ck! qi Va]hUgq][ba Ybha ccXiY

5 WUXYa]W<cbYghmUbX D`U[]Uf]ga

D`U[]Uf]ga `]g`i g]b['h\Y`k cfXg`cf`]XYUg`cZch\Yfg`UbX`dfYgYbh]b['h\Ya `Ug`mci f`ck b"'\lefi\Wb'hU_Y`a Ubm Zcfa gžZfca `XY`]VYfUhY`W\YUh]b['hc`UVW]XYbhU`mWcdm]b['Zfca `U`gci f\W' k]h\ci hUW_bck `YX[Ya Ybh'

IBGK [fcidgdu[]Uf]ga]bhch\YZc``ck]b[WUhY[cf]Yg.

7 cdm]b[.'i g]b['h\Y'gUa Y'cf'j Yfmg]a]`Uf'k cfXg'hc'h\Y'cf][]bU`hYl h'cf']XYU'k]h\ci h'UW_bck `YX[]b['h\Y gci fW'cf'i g]b['ei chUh]cb'a Uf_g"'H\]g'U`gc'Udd`]Yg'hc']a U[Ygž'Ufh'UbX'XYg][b'dfcYWhgž'Ug'k Y``'Ug dfYgYbhUh]cbg'k \YfY'gca YcbY'dfYgYbhg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci h'WfYX]h'

⇒ Uddfcdf]UhY 'dUfUd\fUg]b[...7\Ub[]b['U'ZYk 'k cfXg'UbX'd\fUgYg'k \]'Y 'a cghmfYhJ]b]b['h\Y'cf][]bU` ghfi Wh fY 'UbX#cf'dfc[fYgg]cb'cZ]XYUg'cZh\Y'cf][]bU'žUbX']bZcfa Uh]cb'k]h\ci hUW_bck `YX[Ya Ybh'H\]g'U`gc Udd`]Yg']b'dfYgYbhUh]cbg'k \YfY'gca YcbY'dUfUd\fUgYg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci hWfYX]hUbX'hc d]YW]b['hc[Yh\Yf'ei chYg'UbX'dUfUd\fUgYg']bhc'U'bYk 'k \c`Yžk]h\ci hUddfcdf]UhY'fYZYfYbW]b["

7 c``i g]cb. 'k cf_]b['k]th 'cth Yfg'Vi hidUgg]b['cZZth Y 'k cf_'Ug'U'dYfgcb'g']bX]j]Xi U``k cf_"'7 c``i g]cb'U`gc]bWi XYg'dfcj]X]b['mci f'k cf_'thc'Ubcth Yf'ghi XYbh'VYZcfY'th Y'Xi Y'XUHYZcf'Zcf'th Y'di fdcgY'cZth Ya

- i bXYfgfUbX mci f'f][\hg'UbX'fYgdcbg]V]`]hJYg'Ug'U'gh XYbhUhl BGK
- VY`Uk UfY`cZd`U[]Uf]ga ž`Wcdmf][\hz'l BGK `Gh XYbh7cXY`cZ7cbXi WhUbX`5VWWdhUV`Y`l gY`cZ I BGK `=\forall H`F Ygci f\W\g`Dc`]\m\m
- VY 'Uk UfY 'cZh\Y 'ghUbXUfXg 'cZVY\Uj]ci f'Yl dYWYX 'cZYj YfmcbY ']b 'h\Y 'l BGK 'Wca a i b]hm
- `cWUHY 'gYfj]WYg'UbX ']bZcfa UH]cb'UVci hI BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZh\YgY'UfYUg'k]``VY'ZJa]`]Uf'hc'mci žch\Yfg'k]``VY'bYk"'; U]b]b['U'gc`]X'i bXYfgHJbX]b['cZU``h\YfY`UhYX'UgdYWhg'cZ9@&9'k]``\Y`d'mci 'a U_Y'h\Y'a cghicZmci f'ghi X]Yg'UhI BGK "'\\hd.##qi V'YWfi |XYg"`]VfUfm'i bqk "YXi "Ui #\`]qY#JVci hY`]qY

5WUXYa]W±bZcfaUhjcb

: cf`YggYbhJU``gh XYbh]bZcfa UhJcb`fY`UhJb['hc.

- fYei Yghg Zcf Yl hYbg]cb/`UhY gi Va]gg]cbg [i]XY`]bYg/fYj]Yk 'cZa Uf_g/