H\Y``cWU``gW\cc`gž']bWiX]b[`FcVYfhg`UbX`K "H"`AccfY`Y`YaYbhUfm gW\cc`gž'UbX`7cVV`UbX`AcbhZcfX`a]XX`Y`gW\cc`gž'UfY UddfcUW\]b[`cf`YjYb`YIWYYX]b[`h\Y]f`ZibWh]cbU``WUdUW]hm" FcVYfhg`9`YaYbhUfmž'Zcf`YIUad`Yž']g`dfcYWhYX`hc`gYY`Ybfc``aYbh

@Ycb 7ci bhmž: `cf]XUžI G5 !! =b h\Y k U\_Y cZ cb[c]b[ Wcbghfi Wh]cb Uh h\Y 7 Ubcdm Uh K Y`Ui bYY XYj Y`cda Ybhž bcfh\YUgh @Ycb 7ci bhm ]g VfUW]b[ 'Zcf h\Y Uff]j U` cZ + ž(\$\$ bYk `\ca Yg" H\]g gi VghUbh]U` [fck h\ž \ck Yj Yfž fU]gYg gYf]ci g WcbWY fbg UVci h gW cc` cj YfWfck X]b[ ']b h\Y UfYU" GW cc` VcUfX a Ya VYf 5 j U Ga ]h\ ]g gYh hc UXXfYgg h\YgY ]ggi Yg Uh Ub ]bZcfa U` a YYh]b[ 'cb i bY % ž'U]a ]b[ 'hc XYj ]gY ghfUhY[ ]Yg VYZcfY h\Y dchYbh]U` ]bZi I 'cZ bYk 'ghi XYbhg X]gfi dhg h\Y YXi WUh]cbU` Ybj ]fcba Ybh"



@Ycb`7cibhm`ZUWYg`dchYbh]U``gW&cc``cjYfWfckX]b[`Ug`h\Y KY`UibYY`XYjY`cdaYbh`UXXg`+ž(\$\$`\caYg"`Gc`ih]cbg`UfY ibXYf`X]g₩g]cb"

## K Y`Ui bYY'8Yj Y`cda Ybh'GdUf\_g'GWXcc` 7UdUW]hm'7cbWYfbg']b'@Ycb'7ci bhm'

91 Wrgg]j Y fYg]XYbh]U`XYj Y`cda YbhXcYgb h'i ghUXX bYk bY][\Vcfg/`]h'Wcad`]WUhYg'h\Y'YXiWUh]cbU```UbXgWUdY XfUa\_Uh]WU``m"`K\_]h\`di\_V`]WgW\cc``Ybfc``a\_Ybh'dfc^YWhYX`hc`f]gY`Vm \* i `]b`h\Y`Wca]b[`mYUfgžh\Y`f]dd`Y`YZZYWhg`cb``cWU``WUggfccag Wci `X'VY'qhUf\_"'FYqYUfW\Zfca '798G'dc]bhq'ci h'h\Y'UXjYfqY YZZYWhgʻcZʻcjYfWfckXYXʻgW\cc`gž']bWiX]b[`]bWfYUgYXʻUVgYbhYY]ga UbX'Yj Yb'a cfY'gYf]ci g'WcbgYei YbWYg'gi W\'Ug'\Y][\hYbYX'gW\cc`

## 5XXfYgg]b[ h\YCjYfWfckX]b[ 8] Ya a U

UXj cWUWm"

H\Y'V`i Ydf]bh'qhfUhY[m'U]a q'hc']a d`Ya Ybh'hfUbgZcfa Uh]j Y dfc Y Whg h Uhi a dfc j Y h Y ei U hm c Z Z f Wca a i b hm a Ya VYfg" 9j Yb gcž Ug fYg]XYbh]U`XYj Y`cda Ybhg Yl dUbXž h\Y f]g\_cZ cj YfWfck XYX WUggfcca g`]bWfYUgYgžk \]WX Wci `X`]a dYXY ghi XYbh dYfZcfa UbWY UbX cjYfU``YXiWUh]cbU`eiU`]hm" GWX cc` cjYfWfckX]b[ df]aUf]`mfYgi `hg'Zfca bYk fYg]XYbh]U` XYj Y`cda Ybhg``]\_Y`h\cqY`i bXYfk Um'Uh'K Y`Ui bYYž'\][\`][\h]b[ h\Y`dfYgg]b[`bYYX`Zcf`WccfX]bUhYX`d`Ubb]b[`UbX`YZZYWh]jY

U`Ufa g'UVci h'Zi hi fY'cj YfWfck X]b["

5h'h\Y'\YUfh'cZ']bZfUghfi Whi fY'd`Ubb]b[']g'h\Y'6`i Ydf]bh =bhYf[cjYfba YbhU``5[YbWmfbD=5tžk \]WX`\Ug`VYYb`U`WcfbYfghcbY ]bYb\UbWjb[`Wcaaib]hmdfcYWhgh\fci[\`U`jchYf!UddfcjYX gU`Yg`hUI "`G]bWY`]hg`YghUV`]q\a Ybhž`6D=5`\Ug`k cf\_YX`cb`\_Ym`UfYUg gi WX Ug hf Ubgdc fhUh]cb UbX i h]`]hm a UbU[Ya Ybh YZc fhg Zi bXYX Vm'U``cWU``cbY!WYbh'gU`Yg'gi fhUl 'Uddfcj YX'Vm'HU``U\UggYY!@Ycb 7ci bhmij chYfgi]b:&\$\$\$`UbX:&\$%("'BchUV`mž'6`i Ydf]bhid`Umg'U g][b]Z]WUbh'fc`Y']b'a UbU[]b['Ubh]W]dUhYX'[fck h\žVi h'h\Y``UW\_'cZ  $\label{eq:constraint} Wcbg]XYfUh]cb^{-}Zcf^{-}gW\lambda\,cc^{-}W\lambda\,c]WY^{-}]b^{-}h\lambda\,Y]f^{-}dfc^{-}YWh]cbg^{-}\lambda\,Ug^{-}fU]gYX$ 

## 6`i Ydf]bhg'Fc`Y'UbX'7ca a i b]hm'=a dUWh

bYk gWkcc`"

gcUf'hc'%z( - ( 'ghi XYbhqz'ZUf'YI WYYX]b[ ']hq'WUdUW]hm'cZ'-, \$ ghi XYbhq'Vm'&\$&+ž'Uq'bchYX'Vm'HU``U\UggYY"Wca"'Ga ]h\']q UWh] Y`m'qYY\_]b['qc`i h]cbgžZfca 'UXX]b['WUggfcca g'hc'fYfci h]b[ gWXcc``WXc]WY`gYUhq`cf`YjYb`Wcbg]XYf]b[`h\Y`WcbghfiWh]cb`cZU

j]c`YbWY"'=hg'U'gWYbUf]c'h\Uh'Wci`X'bch'cb`m'UZZYWh'dUfYbhg'Vih U`gc'h\Y'eiU`]hm'cZ'YXiWUh]cb'h\Y]f'W\]`XfYb'fYWY]jY"

@cWU``[cjYfbaYbhg`\UjY'hcc`g`Uh'h\Y]f'X]gdcgU`ž']bWiX]b[ 5XYeiUhY'DiV`]W:UW]`]h]Yg'CfX]bUbWYg"'H\YgY'fY[i`Uh]cbg'WUb dfYjYbh'YIWYgg]jY'XYjY`cdaYbh'h\Uh'dig\Yg'gW\cc`g'cjYf WUdUW]hm"'=hg'WfiW]U`'Zcf'h\Y'Wcaaib]hm'UbX'YXiWUh]cbU` Uih\cf]h]Yg'hc'Yb[U[Y']b'U'WcadfY\Ybg]jY'd`Ubb]b['dfcWYggž'U Wc``UVcfUh]jY'YZZcfh'h\Uh'gUZY[iUfXg'Vch\'bYk'XYjY`cdaYbhg'UbX h\Y'ZihifY'cZ`cW)`'YXiWUh]cb"

H\Y`idWca]b[`aYYh]b[`k]h\`Ga]h\`aUm`bch`dfcXiWY`]aaYX]UhY gc`ih]cbgž`Vih`]h`aUf\_g`U`j]hU``Z]fgh`ghYd`]b`UXXfYgg]b[`h\Y dfYgg]b[`]ggiY`cZ`cjYfWfckX]b["`5g`bcfh\YUgh`@Ycb`7cibhm Wcbh]biYg`hc`Yjc`jYž`h\Y`VU`UbWY`VYhkYYb`bY][\Vcf\ccX`[fckh\ UbX`YXiWUh]cbU``WUdUW]hm`k]``VY`h\Y`hU`\_`cZ`h\Y`hckb"

8 Y hU]`g	
Cfh	@Ycb'7cibhmž:`cf]XUžIG5
EiY``Yb	● k k k "hU``U\UggYY"Wca
	• V`i Ydf]bh]U"cf[
	• WYXg"cf[

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