CVEN3101

9b[]bYYf]b['CdYfUh]cbg'UbX'7cbhfc`



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(fi)

7 ci fgY⁻Cj Yfj]Yk

GHJZZ7cbHJWh78YHJ]`g

7cbj Ybcfg

BUa Y	9a U]`	5j U]`UV]`]m	@cWUh]cb	D∖cbY
?\U`Y[\`6UfUh]	<u>?\U`Y[\"VUfUH]4_i bgk "YXi "Ui</u>	Ubmh]a Y	79&\$- GW&cc``cZ 7]j]``UbX 9bj]fcbaYbh U` 9b[]bYYf]b[(*-\$'-+()

GWXcc``7cbHJWhi=bZcfaUhjcb

<u>9b[]bYYf]b[_`Ghi XYbhGi ddcfhGYfj]</u>Wyg`-`H\Y`Bi WYi g`!`Ybfc`a Ybhž'dfc[fYgg]cb`W\YW_gžWUg\`fYei Yghgž Vci fgY`]ggi Yg`cf`dfc[fUa !fY`UhYX`ei Yf]Yg`

<u>9b[]bYYf]b[`+aXi ghf]U``HfU]b]b[</u>_-+aXi ghf]U``hfU]b]b['ei Ygh]cbg'

LBGK 'Gh Xm5VfcUX'-gh XmUVfcUX'gh XYbhYbei]f]Yg'fZcf']bVci bX'gh XYbhgŁ'

<u>IBGK '9IWXUb[Y</u>'-ghi XYbhYIWXUb[Y'Ybei]f]Yg'fZcf']bVci bX'ghi XYbhgŁ'

LBGK :: i h fY'Gh XYbhg'-'dchYbh]U``gh XYbhYbei]f]Yg'Y"["'UXa]gg]cbgž'ZYYgž'dfc[fUa gž'WfYX]hhfUbgZYf'

D\cbY[.]

fŽ*%'&Ł'-',)`,)\$\$`-BiWYig'GhiXYbh<iV'

fŽ*%`&Ł'-',)`+**%`**-**`9b[]bYYf]b[`⊕Xi gHf]U``HfU]b]b[`

fŽ*%`&Ł'-',)`'%+-`<mark>-</mark>`IBGK `GhiXm5VfcUX`UbX`IBGK `9IWXUb[Y`fZcf`]bVcibX`ghiXYbhgŁ`

7cifgY[·]8YHJ]`g

I b]hg`cZ'7 fYX]h`*`

Gi a a UfmcZh\Y'7ci fgY

H\]gʻgi VYWi]gʻUbʻ]bHcXi Wijcbʻhcʻh\Yʻ[YbYfUʻdf]bVjdʻYgʻcZh\Yʻcf[Ub]gUhjcbʻUbXʻWcbHcʻcZYb[]bYYf]b[cdYfUhjcbg"'H\Yʻgi VYWigHUfhgʻVm`cc_]b[`UhYUfʻmdfUWjhjcbYfgʻUbXʻh\Ycf]ghgʻ]bʻh\Y`UfYUž'UbXʻUdd`]Ygʻh\Y]f h\]b_]b[`hcʻh\Yʻcf[Ub]gUhjcbʻcZWcbgHi WijcbʻdfcYWggʻ??Ymg_]``gʻk]``VY`XYj Y`cdYX`]bʻhja Y`UbXʻfYgci fVW d`Ubb]b[`!`Wf]hjWU``dUh\`bYfk cf_gžXYVjg]cbʻdfcWfggYgž'UbX'ei U`]mžgUZYhmUbX`Ybj]fcba YbHJ``d`Ubb]b[`UbX VcbHc``gmghYa gʻ]bWi X]b[`h\Y`d\UgYgʻcZd`Ub'[YbYfUh]cbžWcbHc``UbX`Wcbhjbi ci gʻ]a dfcj Ya YbHʻ5XX]hjcbU`]ggi YgʻWcbg]XYfYX`]bWi XY`dfcW fYa YbhigmghYa gž']Y`X`cdYfUh]cbgʻUbX`h\Y`dchYbhjU``]a dUWicZh\Y`WcbHc`` cZWcbhjbi ci gʻdfcWfggYgʻUbX`ci hWca Ygʻ'5`dUfhcZh\Y`Wci fgY`UXXfYggYgʻh\Y`cf[Ub]gUhjcb`UbX`WcbHc``UbX UXUdhj Y`a UbU[Ya YbH`:]bU``mh\Y`Wci fgY`U`gc``cc_g`Uhih\Y`a UbU[Ya YbhcZh\Y`Z]fa`]bWi X]b[`dfcXi Wh XYj Y`cda YbhUbX`a Uf_Yhjb[`žYb[]bYYf]b[`YbHYdfYbYi fg\]d`UbX`ZjbUbVjU``d`Ubb]b[`UbX`WcbHc``UbX Yb[]bYYf]b[`YWcbca]Vg'

7 ci fgY 5]a g

H\Y'U]a 'cZh\]g'Wci fgY']g'rc']bHcXi WY'ghi XYbhg'rc'a UbU[Ya Ybhh\Ycfmž'UbX'rc'XYj Y`cd'ghi XYbhg i bXYfgHUbX]b['cZh\Y']a dcfHUbWY'UbX'Udd`]WUh]cb'cZa UbU[Ya YbhZ bWh]cbg'rc'h\Y'gi WWYggZ ` dYfZcfa UbWY'cZYb[]bYYf]b['dfc'YWng'UbX'Yb[]bYYf]b['k cf_g"'H\Y'Wci fgY'UWX]Yj Yg'r\]g'r\fci [\'U Vca V]bUh]cb'cZ`YWhi fY'dfYgYbHUh]cbgžk cf_g\cd'WUggYg'UbX'UggYgga YbhYI YfW]gYg'r\UhUfY'XYg][bYX'rc]bHcXi WY'ghi XYbhg'rc'[YbYfU`a UbU[Ya Ybhdf]bW]d`Yg'UbX'YbUV'Y'r\Ya 'rc'Wf]h]WU`mfYZYWhcb'\ck h\YgY'df]bW]d'Yg'UfY'Ya d`cmYX']b'h\Y'fYU`k cfX"

7cifgY'@YUfb]b['CiHWcaYg

5ZhYfigi VVV/ggZ ``mWca d`Yh]b[ih\]g'Vci fgYžmci ig\ci `X'VY'UV`Yihc.

@YUfb]b[`CiHWcaY	95 GHJ[Y %7ca dYhYbW]Yg
%"`8Ya cbghfUhY`ZJa]`]Uf]hnik]h\`XYZ]b]h]cbg`cZYb[]bYYf]b[`UbX a UbU[Ya Ybhik cf_	D9%"*
&"`LbXYfgHUbX`H\Y`Y`YaYbhg`cZYWcbca]Wg`UbX`ZbUbWJU` aUbU[YaYbhUbX`f]g_`aUbU[YaYbh	D9%"%
'"I bXYfgHUbX`UbX`i gY`dfc?YWria UbU[Ya Ybhhcc`g`gi WX`Ug.`; UbHh WXUfhiUbX`7DA`WXUfhg	D9%")
("`5bU`mgY`dfU₩jWU``Wcbg]XYfUh]cbg`k∖Yb`aUbU[]b[`Wcbghfi₩i]cb dfc^Y₩fg	D9%"(
)""5ddfYWJUHY"H\Y"_YmUgdYWfg"cZdfc"YWfaUbU[YaYbh]bWiX]b[HjaYžWcghžigUZYhmUbX"eiU`]hm	D9&"%
*"`LbXYfgHUbX`H\Y`fc`Y`cZYH\]Wg`]b`Yb[]bYYf]b[`dfcZYgg]cbU`]ga	D9' "%

HYUW]b[GhfUhy[]Yg

 $\label{eq:constraint} D`YUgY`fYZ'f`hc`h\Y`]bZcfa~Uh]cb`]b`A~ccX`Y$

5ggYgga Ybh

5ggYgga YbhHJg_	K Y][∖h	8iY'8UHY	7cifgY`@YUfb]b[CihWcaYgʻ5ggYggYX
%"91Ua]bUh]cb	*\$I	Bch5dd`]WUV`Y	%ž`&ž`'Ž`(Ž`)Ž`*
&"`5gg][ba Ybh	(\$1	Bch5dd`]WUV`Y	%ž`&ž`' Ž`(Ž`) Ž`*

5ggYgga Ybh% 9l Ua]bUhjcb

A]X!hYfa '91 Ua]bUh]cb

H\Y`A]X!hYfa`9IUa]bUh]cb`]g`Ub`cb`]bY`cdYb!Vcc_`YIUažUbX`ghiXYbhg`WUb`\UjY`UVWYgg`hc`U``Zcfai`Ug UbX`gidd`YaYbhUfm`XUhU`XYYaYX`bYVYggUfmhc`Wcad`YhY`WU`W``Uh]cb`eiYgh]cbg"`H\]g`9IUa]bUh]cb`k]``VY VUgYX`cb`h\Y``YWfifY`UbX`kcf_g\cd`aUhYf]U`g`id`hc`UbX`]bWiX]b[`K99?`("

:]bU`'9I Ua]bUhjcb'

5 HYbXUbW/FYei]fYaYbhg

Ghi XYbhgʻUfYʻghfcb[`mʻYbWci fU[YX'hcʻUhhYbX'U```WUggYgʻUbX'fYj]Yk ``YWhi fYʻfYWcfX]b[g"

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

D`YUgY`fYZYf`hc`h\Y`A ccX`Y`dU[Y`cZh\Y`Wci fgY`Zcf`Z fh\Yf`[i]XUbWY`cb`UggYgga Ybhigi Va]gg]cb"

I BGK `\Ug`U`gHUbXUfX``UhY`gi Va]gg]cb`dYbU`hmcZ

)ı 'dYf'XUmž'Zcf'U``UggYgga Ybhg'k \YfY'U'dYbU`hm'Udd`]Ygž'WUddYX'Uh'Z]j Y'XUmg'f%&\$'\ci fgŁz'UZYf k \]W\'U'ghi XYbh'WUbbchigi Va]h'Ub'UggYgga Ybhž'UbX'bc'dYfa]hhYX'j Uf]Uh]cb"

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

6Yk UfY**5b*Ugg][ba Ybhh\Uh]bWi XYg*d*U[]Uf]gYX*a UhYf]U**k]***fYWY]jY*U*\$i=***U]*žUbX*ghi XYbhg*k \c d*U[]Uf]gY*a UmZu]**h\Y*Wci fgY***Ghi XYbhg*k \c*d*U[]Uf]gY*UfY*U*gc**]UV*Y*hc*X]gW]d*]bUfmUWf]cbž*]bWi X]b[YI Wi g]cb*Zfca *Ybfc*a Ybh

D`U[]Uf]ga `]g`h\Y`i gY`cZUbch\Yf`dYfgcb'g`k cf_`cf`]XYUg`Ug`]Zh\Ymk YfY`mci f`ck b"`K \Yb`]h]g`bYWyggUfmcf XYg]fUV`Y`hc`i gY`ch\Yf`dYcd`Y'g`a UhYf]U``mci `g\ci `X`UXYei UhY`mUW_bck `YX[Y`k \cgY`k cfXg`cf`]XYUg`h\Ym

5WUXYa]W=bZcfaUh]cb

:]bU``9I Ua]bUh]cbg.

:]bU``YI Ua g`]b`H' `&\$&&`k]``VY`\Y`X`cb`]bY`VYłk YYb`&) h\`B`cj Ya VYf`!`, h\`8YWYa VYf`&\$&&`]bWi g]j Yž'UbX gi dd`Ya YbhUfm`YI Ua g`VYłk YYb`-h\`!`% h\`>Ubi Ufm&\$&' `]bWi g]j Y"`Nci `UfY`fYei]fYX`hc`VY`Uj U]`UV`Y`cb h\YgY`XUhYg"`D`YUgY`Xc`bchhc`a U_Y`UbmdYfgcbU``cf`hfUj Y``UffUb[Ya Ybhg`Xi f]b[`'h\]g`dYf]cX"'

57589A = 7 58J = 79

- ? YmiGHJZ/tc '7 cbHUWiZcf'5WUXYa]W5Xj]WY flc[']b k]h mci f'n=8 'UbX dUggk cfXŁ <u>\htdg.#lbHUbYHWj Yb["i bgk "YXi "Ui # YmlgHJZI/tc!WcbHUWiXi f]b[!mci flghi X]Yg!UHi bgk</u>
- ?Yml_BGK_8UhYg!'Y["'7Ybgi g'8UhYžYI Ua 'XUhYgž`UghXUmhc'Xfcd'U'Wci fgY'k]h\ci h UWUXYa]\#]bUbW[U```]UV]`]hmiYh\V'
- 7 J 9B 'Gh XYbh = bh UbYh flc [']b k]h 'mci f'n=8 'UbX dUggk cfXŁ '<u>hhdg.#bh UbYh Wj Yb['i bgk "YXi "Ui #gh XYbh]bh UbYh</u>'
- Gli XYbh@]ZY`Uh7J 9Bž]bWi X]b[`Gli XYbh GcW]Yh]Yg. \htdg.#k k k ii bgk "YXi "Ui #/b[]bYYf]b[#Mji]!UbX!Ybj]fcba YbhU`!Yb[]bYYf]b[#ghi XYbh`]ZY`
- GdYWJU``7cbg]XYfUHjcb.<u>\hhdg.##gh XYbh'i bgk "YXi "Ui #gdYWJU`!Wcbg]XYfUHjcb</u>`

5ddYbX]I. '9b[]bYYfg'5ighfU`]U'f195ŁDfcZYgg]cbU`'9b[]bYYf'7cadYhYbWm GHJbXUfX

Dfc[fUa +bhybXYX @YUfb]b[Cihwca Yq ? bck `YX[Y 'UbX'q_]``'VUqY D9%"%7cadfY\Ybq]iYžh\YcfmVUqYXibXYfqHUbX]b[cZh\YibXYfd]bb]b[bUhifU`UbX d/mg]WU`:gW]YbWYg`UbX`h\Y`Yb[]bYYf]b[`Z bXUa YbHU`g`Udd`]WUV`Y`hc`h\Y`Yb[]bYYf]b[`X]gW]d`]bY D9%"& 7 cbW/dhiU`i bXYfqHUbX]b[cZh\Y`a Uh\Ya Uh\Wažbi a Yf]WU`UbU`mg]qžqHUh|qh\WažUbX Weadi hYf'UbX']bZcfaUh]cb'gW]YbWYg'k\]WX'i bXYfd]b'h\Y'Yb[]bYYf]b['X]gW[d`]bY D9%" + + XYdh i bXYfqHbX]b[cZqdYWU`]qhVcX]YqcZ bck YX[Yk]h bhY'Yb[]bYYf]b[X]qWd`]bY D9%"('8]qWFfba YbhcZ_bck YX[YXY]Ycda YbhUbXfYqYUfWXX]fYWfcbg'k]h.jb'h.Y Yb[]bYYf]b[`X]gWJd`]bY D9%") ? bck `YX[Y`cZYb[]bYYf]b[`XYg][b`dfUW]WY`UbX`WcbhYl hi U``ZJW/cfg`]a dUWf]b[`h\Y Yb[]bYYf]b['X]qW[d`]bY D9%"* I bXYfqHJbX]b[cZh\Y'qWcdYždf]bW]dYgžbcfa gžUWVci bHJV]]]h]Yg'UbX'Vci bXg'cZ qi qHU]bUV`Y`Yb[]bYYf]b[`dfUWf\WY`]b`H\Y`qdYW[Z]WX]qW[d`]bY 9b[]bYYf]b['Udd`]WUh]cb'UV]`]m D9&"%5dd`]WUhjcb`cZYghUV`]g\YX'Yb[]bYYf]b[`a Yh\cXg`hc`Wca d`YI 'Yb[]bYYf]b[`dfcV`Ya qc`i]b[D9&"&: `i YbhUdd`]WUhcb'cZYb[]bYYf]b['hYWkb]ei Ygžhcc`g'UbX'fYgci fWfg D9&" 5dd`]WUhjcb`cZgmghYa UhjWYb[]bYYf]b[`gmbh\Yg]g`UbX`XYg][b`dfcWYggYg D9&"('5dd`]WUHcb'cZgmghYa UHWUddfcUWXYg'hc'h\Y'WcbXi WiUbX'a UbU[Ya YbhcZYb[]bYYf]b[dfc Y₩q DfcZYgg]cbU`UbX dYfgcbU`Uhf]Vi hYg D9' "%'9h\]WU``WcbXi WiUbX'dfcZygg]cbU``UVWci bHUV]`]hm D9' "&'9ZYW) Y'cfU`'UbX'k f)HYb'Wca a i b)WU) cb']b'dfcZygq]cbU`'UbX'`UmXca U]bg D9' "' 7 fYUhi Yžibbci Uhi YUbXidfc!UWi YXYa YUbci f D9' "('DfcZygg]cbU``i gY'UbX'a UbU[Ya YbhcZ]bZcfa Uhcb D9' ") CfXYfma UbU[Ya YbhcZgYZzUbX dfcZygq]cbU`WcbXi Wh D9' "* 9ZYWAJ Y HYUa 'a Ya VYfg\]d UbX HYUa 'YUXYfg\]d