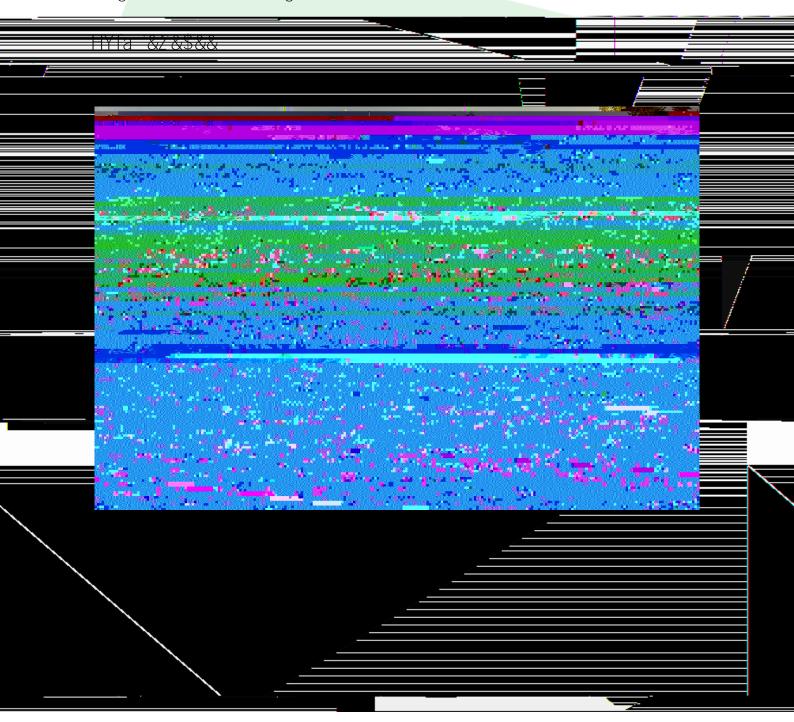


CVEN4104

GigHJbUV]`]hm]b7cbghfiWh]cb



7ci fgY Cj Yfj]Yk

GHJZ:7cbHJWh8YHJ]`g

7cbj Ybcfg

BUa Y	9a U]`	5j U]`UV]`]lm	@cWUh]cb	D\cbY
8 f '5 `] '? Ug\Ub]	<u>U`]" Ug\Ub]4 i bgk "YXi "Ui</u>			

GWXcc`7cbHJWh =bZcfa Uh]cb

<u>9b[]bYYf]b['Gh'XYbhGiddcfhGYfj]WYg'-</u>'H\Y'BiWYig'!'Ybfc`a Ybhž'dfc[fYgg]cb'W\YW_gž'WUg\'fYei Yghgž WtifgY']ggi Yg'cf'dfc[fUa!fY`UhYX'ei Yf]Yg'

9b[]bYYf]b['+bXi glf]U`'HfU]b]b['--'+bXi glf]U`'lfU]b]b['ei Ygl]cbg'

<u>I BGK "Gh Xm5VfcUX"</u>— gh XmUVfcUX gh XYbhYbei]f]Yg fZcf']bVci bX gh XYbhgŁ'

<u>I BGK '91 WXUb[Y</u>'-gh XYbhYl WXUb[Y'Ybei]f]Yg'flcf']bVci bX'gh XYbhgl'

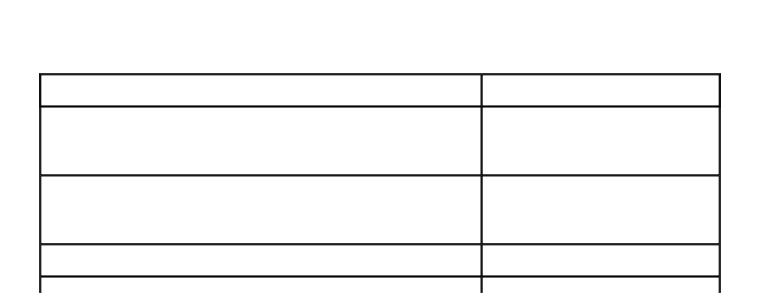
LBGK : i h fy Gh XYbh - dch bh U`gh XYbh Ybei]f]Yg Y"["UXa]gg]cbgž ZYYgž dfc[fUa gž WfYX]h lfUbgZYf

D/cbY.

fŽ*%'&Ł'-',) ',) \$\$'-Bi WYi g'Ghi XYbh<i V'

fŽ*%%&L'-',) '+**%'-'9b[]bYYf]b['=bXi ghf]U`'HfU]b]b['

fŽ*%%&£'-',) " %+- '-1 BGK 'Gh Xm5VfcUX'UbX'1 BGK '91 WXUb[Y'fZcf']bVci bX'gh XYbhg£'



 $\label{eq:continuity} D`YUgY`fYZYf`hc`mci f`WUgg`h]a YhUV`Y`Zcf`h\Y``YUfb]b[`UWf]j]h]Yg`mci `UfY`Ybfc``YX`]b`UbX`UhhYbX`cb`mh\cgYWUggYg''$

•	8Um	H]a Y	@cWUh]cbł
@YWhi fYg	K YXbYgXUm	%%Ua '!'&'da	<mvf]x. 'c="" 'ubx'="" +b!="" b`]by="" dyfgcb'uh<="" th=""></mvf]x.>
			GW]YbWY:H\YUlfY:f?!
			: % !; \$-Ł'fK YY_g'%) ž+!%\$Ł
	•	•	
8Ya cbglfUhlcbg	H\i fgXUm	- 'Ua '!''‱'Ua	EiUXfUb[`Y'; \$(\$'fP!
			9%)!; \$(\$ŁfK YY_g.(!) ž+!-Ł
	H\i fgXUm	‰'Ua '! '%'da	C b`]bY fK YY_g.(!) ž+!- Ł

 $\label{thm:def} \mbox{$I$ B chY.$$'=$Z mci 'UfY'i bk Y```cf'\Uj Y'VYYb'Ug_YX'hc'gY'$Z]gc`UhY'!'d`YUgY'Xc'bch'UhhYbX'WJa di g'cf'WUgg'UbX' 'c]b'cb`]bY'WUgg'$Zcf'h\Uh'k YY_" \mbox{}$

5ggYgga Ybh

5ggYgga YbhhUg_	K Y][\h	8iY'8UhY	7 ci fgY`@YUfb]b[Ci hWca Yg`5ggYggYX
%"Ei]n	% \$I	K YY(%ž [*] &
&""; fci d'5gg][ba Ybh	' \$ı	K YY_"%\$	&
' "':]bU`'91 Ua	*\$1	Bch5dd`]WUV`Y	%ž'&ž'' ž'(

5ggYgga Ybh% Ei]n

8i Y`XUhY. K YY__(8YUX`]bY`Zcf`UVgc`i hY`ZU]`. "B#5 A Uf_g`fYhi fbYX. "K YY__(

Ai`hjd`Y`W\c]Wyg

5ggYgga Ybh'Wf]hYf]U

H\Y'ei]n'WcjYfg't\Y'`YWfifY'WcbtYbtg'cZKYY_'%z'&'UbX'' 'f]bWfig]jYt''

5ggYgga Ybh&; fci d 5gg][ba Ybh

8i Y XUhY. K YY_ ***

8YUX`]bY'Zcf'UVgc`i hY'ZU]`. "VYZcfY'h\Y'Z]bU`'YI Ua

A Uf_g`fYh fbYX. ``VYZcfY`h\Y`ZbU``Yl Ua

5 fYdcfhgi Va]hh/X j]U Hi fb]h]b fUddfcl "'%) du[Yg Zcf [fci dg cZ' gh XYbhgŁ

H\]g`Ugg][ba Ybh]g`gi Va]hhYX`h\fci [\'Hi fb]h]b`UbX`ghi XYbhg`Xc`bchgYY`Hi fb]h]b`g]a]`Uf]hmfYdcfhg"

5ggYgga YbhWf]hYf]U

; fci d'Ugg][ba Ybh]g'VUgYX'cb'h\Y''YWi fY'UbX'XYa cbglfUh]cb'WcbhYbhg'cZK YY_'&'hc') 'f]bWi g]j YŁ"

<i fX`Y`fYei]fYa Ybh

5 'a Uf_'cZUh`YUgh'(\$i ']b'h\Y'[fci d'Ugg][ba Ybh']g'fYei]fYX'VYZcfY'h\Y'WUgg'k cf_']g']bWi XYX']b'h\Y'Z]bU`a Uf_"

5ggYgga Ybh' ::]bU` 9l Ua

8YUX`]bY'Zcf'UVgc`i hY'ZU]`.''H65 A Uf_g'fYhi fbYX.''H65

7 U'W 'Uhjcbgž'UbX'UbU'mhjWU'ei Yghjcbg

H\]g`Ugg][ba Ybh]g`gi Va]h\X`h\fci [\'Hi fb]h]b`UbX`ghi XYbhg`Xc`bchgYY`Hi fb]h]b`g]a]`Uf]hmfYdcfhg"

5ggYgga Ybh'Wf]hYf]U

 $\label{eq:hamiltonian} H\Y`YIUa~`Wcj~Yfg`h\Y`YbhJfY`WcbhYbhg`cZh\Y`Wci~fgY"$

<i fX`Y'fYei]fYa Ybh

 $5 \text{ `a Uf_`cZUh``YUgh`($i \text{ `]b'h\Y'Z]bU``YI Ua]bUh]cb']g'fYei]fYX'VYZcfY'h\Y'WUgg'k cf_']g']bWi XYX']b'h\Y'Z]bU``a Uf_''$

5 hmy b X Ub WY F Yei] f Ya Yb hg

 $\hbox{Ghi XYbhg'UfY'ghfcb[`m'YbWc'i fU[YX'hc'UhhYbX'U```WUggYg'UbX'fYj]Yk'``YWhi fY'fYWc'fX]b[g''' } \\$

7ci fgY'GWXYXi `Y

J]Yk 'WUgg'ha YhUV'Y

H]a YtUV`Y

8 UhY	Hmd Y	7 cbhYbh
K YY_'%'' \$'A Um!'' >i bY	@YWhi fY	

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]XUbW\`cb`UggYgga Ybhigi Va]gg]cb"

I BGK \UgʻUʻghUbXUfX``UhYʻgi Va]gg]cb dYbUʻhmcZ

•)ı 'dYf'XUmž'Zcf'U``'UggYgga Ybhg'k \YfY'U'dYbU'hm'Udd`]Ygž'WUddYX'Uh'Zj Y'XUmg'f1%\$'\ci fgŁž'UZNYf k\]WX'U'gh XYbh'WUbbchgi Va]h'Ub'UggYgga Ybhž'UbX'bc'dYfa]hNYX'j Uf]Uh]cb"

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

6Yk UfY "5b" Ugg][ba Ybhh\Uh]bWi XYg"d`U[]Uf]gYX"a UhYf]U``k]```fYWY]j Y"U"\$ı ': U]`žUbX`ghi XYbhg`k \cd"\U[]Uf]gY\"a UmZU]``h\Y'Wci fgY"'Ghi XYbhg`k \cd"\U[]Uf]gY\"UfY\"U`gc"`]UV`Y'hc"X]gW]d`]bUfm'UWf]cbž]bWi X]b[YI Wi g]cb'Zfca 'Ybfc`a Ybh'

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