7ci fgY'Cj Yfj]Yk

GHJZZ7cbHJWh8YHJ]`g

7cbj Ybcfg

BUa Y	9a U]`	5j U]`UV]`] m	@cWUh]cb	D\cbY
GcbmU [*] @]ZgVX]m	g"`]ZgVX]m4 i bgk "YXi "Ui	d`YUgY'Ya U]`'Zcf	FcVYfh	
		Uddc]bha Ybh'	KYVghYf*%\$(

GWkcc~7cbhJWh~abZcfa Uh]cb

GVXcc``cZhY`5fhg`UbX`AYX]U

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D\cbY.'f\$&E'-',)'(,)*

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K YVq]hY. k k k "Ufhq"i bak "YXi "Ui #qUa

 $\label{eq:hamiltonian} $$HY'GWKcc``cZhY'5ftg'UbX'AYX]U'kci`X``]_Y'hc'FYgdYWM\cong \cong m5W_bck`YX[Y'h\Y'HfUX]hjcbU``7ighcX]Ubgžh\Y'6YXY[U'`fPYbg]b[hcb'WJadigŁž'; UX][U'`fP]hmUbX'5fh\/'8Yg][b'7UadigYgŁ'UbX'h\Y'B[ibbUkU`dYcd'Y'fbighfU`]Ub'8YZYbW': cf\W'5\WJXYam]b'7UbVYffUŁ'cZh\Y'`UbXg'k\YfY'YUW\'WJadig'cZIBGK']g`c\WJhYX''$

7ci fgY 8YHJ] g

7 fYX]hDc]bhg**

Gi a a UfmcZh\Y 7ci fgY

H\]g`Wci fgY`XYj Y`cdg`gdYWJU`]gYX`_bck `YX[Y`cZU`fUb[Y`cZa i g]WgmiYg`]bWi X]b['fhcgY`XYf]j YX`Zfca dUffjW `Uf`\]ghcf]WU``dYf]cXgž[YbfYg`UbX`UddfcUW.Yg`hc`a i g]WJbHYfdfYhUhjcb"'H\]g`_bck `YX[Y`k]```VY UWei]fYX`fhci [\`U`WcgY`ghi XmcZa i g]WU``gWcfYgž'U'k]XY`fUb[Y`cZgY`YWHX`fYdYfhc]fYž'fYWcfX]b[gž8J 8 g UbX`a i g]WU``gW\c`Ufg\]d`gi ddcffjb['dYfZcfa UbW'''Ghi XYbhg`k]``VY`YI dYWHXX`hc`XYa cbghfUhY`Ub`UV]`]mihc dfYgYbh'U`gmi]gh]WU``m]bZcfa YX`dYfZcfa UbW'`k]h\`WUfYZ ``Wcbg]XYfUhjcb`cZfY`Yj Ubh'hYW.b]WU``UbX]bhYfdfYhUhj Y`]ggi Yg"

7 ci fgY @YUfb]b[Ci hWca Yg

%" 8 Ya cbglfUhY 'gc`]X 'hY W\b]\WU``g_]``gž`]bZcfa YX 'a i g]\WU``^ X[Ya Ybh'UbX`Wcbj]\W]cb`]b`dYfZcfa Ub\W'" &" 8]gd`UmdfcZYgg]cbU`]ga 'UbX`cf][]bU`]hm`]b`ZJg\]cb]b['UbX`fYU`]g]b['U'dYfZcfa Ub\W' dfcY\W'' \" 5 fh\W``UhY`gcd\]gh\WUhYX`]XYUg`fY`Uh\b['hc`U'VfcUX`fUb[Y`cZa i g]\WU``UbX`dYfZcfa Ub\W'`ghmYg"

HYUWX]b[GhfUhY[]Yg

H\Y`fUh]cbu`Y`Zcf`h\]g`Wci fgY`]g`df]a Uf]`mih\Uh[fUXi UhYg`k]```fYei]fY`U`j Yfm\][\```Yj Y``cZdYfZcfa UbWY`g_]`` UbX`Wca d`Ya YbhUfmfYdYfhcf]U``UbX`]bhYfdfYh]j Y`_bck `YX[Y`]b`U`gY`ZgY`YWhYX`UfYU`cZa i g]Wa U_]b["`` H\YfYZcfYž'U`gYf]Yg`cZgdYW]U`]gha UghYfWUggYg`WcbXi WhYX`VmYI dYfh]bghfi a YbhU``UbX`j cWU``dfUWf]h]cbYfg k]```VY`XYd`cmYX`hc`Wca d`Ya Ybhk cf_g\cdg`h\UhYI Ua]bY`UbX`fYZYWhcb`]ggi Yg`Uf]g]b[`Zfca 'h\Y a UghYfWUggYg`h\fci [\`WUgg`X]gW gg]cb`UbX`ghi XYbhdYfZcfa UbWY!VUgYX`XYa cbghfUh]cbg"``5`gYf]Yg`cZ`YWfi fYg`k]``]bhfcXi WY`_YmfYgci fWYg`UbX`UddfcUWXYg`hc`UbU`mg]g`Zcf`dYfZcfa Yfg`UbX`YI dUbX`_bck`YX[YcZU`k]XY`fUb[Y`cZfYdYfhc]fY"``

5ggYgga Ybh

: i ff\\Yf`XYHJ]``dYffU]b]b['hc`UggYgga YbhZcf`f\\]g`Wci fgY`k]```VY`X]gW ggYX`]b`WUgg`]b`K YY_'%cZH' "

5ggYgga Ybh'HUg_g'

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±b!WUgg'@YWhifY!FYWJhU``	(\$1	K YY_')	% <u>ž&</u> Ž
FYgYUfWX^dUdYf^cb^gY^YWWYX hcd]W	&\$ı	9bX°cZkYY_`,	1
Di V`]WdYfZcfa UbWV	(\$1	K YY_g'-#%\$#%%	%ž&

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GhUfhXUhY. Bch5dd`]WUV`Y

@Yb[h\.'%\$!%%'a]bi hYgž']bWi X]b['dYfZcfa UbWY'UbX'gdc_Yb'dfYgYbhUh]cb

8YHJ]`g.

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: YYXVUW_. K f]hhyb fydcfh'

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

H\]g`%\$!%&`a]bi hYg!`cb[`dfYgYbhUh]cb`k]```]bWi XY`Vch\`U`dYfZcfa UbWY`cZfYdYfhcf]Y`gY`YWN]cb`UbX`U gdc_Yb`dfYgYbhUh]cb`k \]W\`k]```WcbhYl hi U`]gY`h\Y`fYdYfhc]fY`W\cgYb"`Ghi XYbhg`UfY`UXj]gYX`hc`i gY Dck YfDc]bhz`Ub]a UhYX`g`]XYgz`dcXWUghihYW\b]ei Yg`cf`Ubmich\Yf`WfYUh]j Y`Zcfa Uhg`cZh\Y]f`W\cg]b[`hc`XY`]j Yfh\Y]f`dfYgYbhUh]cbg"

Gi Va]gg]cb bchYg.`]j Y cf'cb`]bY dfYgYbhUh]cbžXYdYbX]b[cb 7 CJ =8!% g]hi Uh]cb

5ggYgga Ybh& F YgYUfW dUdYf cb gY`YWYX hcd]W

GhUfhXUhY. Bch5dd`]WUV`Y

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%\$\$!%) \$\$ "k cfXg"

: YYXVUW_'dfcj]XYX'j]U'@A G"

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

FYgYUfWX DUdYf Gi a a Ufm

Mci 'k]```fygYufW.'U'dfcYWi]bj c`j]b['bcb!ffUX]h]cbU``UbX'cf][]bU``dfYgYbHUh]cb'Zcfa Uhz'gi W.'Ugz'Zcf]bgHUbW'z'a i 'h]a YX]U'cf']bhYfX]gW]d`]bUfmUddfcUW.'hc'dYfZcfa UbW'/i b]ei Y'UbX']bj Ybhjj Y'i gY'cZbcb! ffUX]h]cbU``dYfZcfa UbW''j Ybi Yg'cf'gHU[]b['UddfcUW.Yg/cf][]bU'z'WfYUhj Y'UbX'i bcfh\cXcl 'WcbW'dh'bcb! cfh\cXcl 'Ui X]YbW' Yb[U[Ya YbhUbX'dUfh]W]dUh]cb/UWhj Y'Wca a i b]lmYb[U[Ya Ybhicf'Yb[U[Ya Ybhk]h\ gcW]U'#dc`]h]WU``]ggi Yg'h\fci [\'dYfZcfa UbW'/cf'Ub'cf][]bU``UXUdhUh]cb'hc'Ub'cb`]bY'dYfZcfa UbW''a YX]i a ']b fYWYbhhja Yg"

C bW/ 'mci '\Uj Y']XYbh]Z]YX'h\Y'dfc YWh\UhgdYU_g'hc'mci 'UbX'mci f'dUfh]W/YUh]j Y'Ugd]fUh]cbgž'U'dfc YWh h\Uh]bgd]fYg'mci 'UbX'a cXY\g'Zcf'mci 'Ufh]gh]W/j U'i Yg'mci fX'`]_Y'hc'Ya i \UhYz'mci 'k]```YUfb'Ug'a i W\'Ug'mci WUb'UVci hh\Y'dfc YWh\fci [\'mci f'ck b'fYgYUfW\'UbX'k]``gi VgYei Ybhm\VcbHUWh\Y'_Ym\VfYUh]j Y#g]bj c'j YX']b'h\Y'dfc YWhZcf'Ub']bhYfj]Yk "

 $\label{thm:condition} $$ Mci'k]^*XYj]gY'U'gYhcZ]bhYfj]Yk 'ei YghJcbg'h\UhVYghiHUf[Yhh\Y']bZcfa UhJcb'mci'k ci `X``]_Y'hc'[`YUb'Zfca h\Y']bhYfj]Yk YY'''H\Y'dcgg]V`Y']bhYfj]Yk 'ei YghJcbg'k]^*VY'k cf_g\cddYX']b'WUgg'cbWY'h\Y'dfcYWfg'\Uj YVYYb']XYbhJZYX'UbX'h\Y'UffJghg'WcbhUWh'X''$

Mci f'dUdYf'k]```XYfU]`'h\Y'UgdYWg'cZh\Y'dfcYWhUbX'k\Uh'UddYU'YX'hc'mci 'UVci h']h/Y'i WJXUhY'k Umg']b k\]W\'fYgYUfW\]b['h\]g'dfcYWh\Ug']a dUWhYX'cb'mci f'ck b'WfYUh]j Y'hfUYWcfm]b'fYU`]g]b['UbX'XY`]j Yf]b[mci f'WfYUh]j Y'dfcYWh']b'h\]g'Wci fgY/UbX'X]gW gg'h\Y'`YUfb]b[g'Zfca ']bhYfj]Yk]b['h\Y'fa U_YfficZh\Y'dfcYWh'

Gi Va]gg]cb bch/g.k f]hh/b Ugg][ba Ybhcf dcXWJghgi Va]hh/X j]U A ccX Y

5ggYgga Ybh' . Di V`]WdYfZcfa UbW

GhUfhXUhY. Bch5dd`]WUV`Y

@Yb[h\. 5ddfcl %)!% a]bi hYg

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8]fyWhZyyXVUW_Zc``ck]b['dyfZcfa UbWY"

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H\Y'di V`]WdYfZcfa UbWY'dfcYWfik]``VY'Ub'cf][]bU`žWcbWYdh U`]gYX'UbX'h\Ya Uh]WU``miW fUhYX'dfc[fUa

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Gi Va]gg]cb bchYg.

5 http://bxubww.F.Yei]fYa Ybhg

D`YUgY`bchY`h\Uh`YWh fY`fYWcfX]b[g`UfY`bch'Uj U]`UV`Y`Zcf`h\]g`Wci fgY"`Gh XYbhg`UfY`ghfcb[`miYbWci fU[YX`hc UhhYbX`U```WUggYg`UbX`WcbhUWhh\Y`7ci fgY`5i h\cf]hmhc`a U_Y`U`hYfbUh]j Y`UffUb[Ya Ybhg`Zcf`WUggYg a]ggYX"

7ci fgY'GWXYXi `Y

J]Yk Wugg'ha Yhuv'y

H]a YHJV`Y

8 UhY	HmdY	7 cbhYbh	
K YY_'%'%('GYdhYa VYf'! %'GYdhYa VYf	GYa]bUf	■blfcXi Wgcbg/; cU`gYldb[/5ggYgga YbhVfYU_! Xck b/; fci d'ldg_"	
K_YY_`&.`&%`GYd iY a_VYf`!	GYa lbUf	Dfc YWi8Yg][b'UbX'8Yj Y`cda Ybh! '±b!WUgg	
&) GYdhYa VYf		k cf_g\cd'UbX'X]gW gg]cb"	
K YY_'' .'&, 'GYdhYa VYf'! &'C WcVYf	GYa]bUf	Gh XYbh]b!WUgg dYfZcfa UbWgž[fci d X]gW gg]cb UbX ZYYXVUW_"	
K YY_'(.') 'CWhcVYf'!'- CWhcVYf	GYa]bUf	±bhYfj]Yk]b['hYWXb]eiYg/GhXYbh]b!WUggdYfZcfaUbWYgž'[fcid'X]gWgg]cb'UbX'ZYYXVUW_"	
K YY_^).^%&^CWcVYf^!^%* CWcVYf	5ggYgga Ybh	±b!WUgg``YWfi fY!fYWJhU``dfYgYbhUhJcb`UggYgga Ybh k YY_"	
K YY_'*.'%-'CWcVYf'!'&' CWcVYf	FYUX]b[FYUX]b[#`YI]KYY`GhiXYbhg`k]``'U``cWJhYYIhfU h]aYhc`dYfgcbU``dfUWh]WYžfYZYWh]cb`UbX`dfcYWh XYjY`cdaYbh'	
K YY_'+.'&*'C WcVYf'!'' \$ C WcVYf	GYa]bUf	±x]j]Xi U``ghi XYbhWcbgi `hUhjcbg`k]h\`GcbmU`cb XYj Y`cd]b[`UbX`fYZ]b]b[`Z]bU``WfYUhjj Y`dYfZcfa UbW dfc↑YWf	
I/	01/ 31.110	=b!WUgg'dYfZcfa UbW'g'UbX'ZYYXVUW_"	
K YY_', .`&'Bcj Ya VYf'!'* Bcj Ya VYf	GYa]bUf	±9!7`Ugg`k cf_g\cdg`!`Z bU`]g]b[`dfcYWhdfYgYbrUr]cbg/]b!WUgg`dYfZcfa UbWYg" FYgYUfW\`DUdYf`XiY°	
K YY_''- 'Bcj Ya VYf'! % 'Bcj Ya VYf	GYa]bUf	±1.7`Ugg`k cf_g\cdg`!`ZbU`]g]b[`fYa U]b]b[`dfcYWhdfYgYbfUf]cbg/	
		Di V`]WdYfZcfa UbWY`UggYgga Ybhg`VY[]b"	
K YY_'%\$.'%*'BcjYa VYf'! &\$'BcjYa VYf	5ggYgga Ybh	Di V`]WdYfZcfa UbWY`UggYgga Ybhg`Wcbh]bi Y"`7`Ugg XYVf]YZ'	

FYgci fWyg

DfYgWf]VYX F Ygci fWYg

HYI h/cc_'GhY]bž8YVcfU\"'f&\$\$) Ł"'9b[U[]b['A i g]W'BYk 'Mcf_žC| ZcfX.'C| ZcfX'I b]j Yfg]miDfYgg" 5B8.

%"9j Yfmt\]b[']g'7cbbYWYX.'H\Y'Dck Yf'cZA i g]WVm8Ub]Y`'6UfYbVc]a &"'A chjcbž'9a chjcbž'UbX'@cj Y.'H\Y'BUhi fY'cZ5fhjghjWDYfZcfa UbWY'VmH\ca Ug'7Ufgcb'A Uf_ ' "'@YhtYfg'hc'U'Mci b['DcYhVmF U]bYf'F]`_Y ("'H\Y'F Ygh']g'Bc]gY'Vm5`YI 'F cgg

FYWca a YbXYX FYgci fWYg

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6UWXž7"D"9"f% (- L"'9ggUmcb'h\Y'lfi Y'UfficZd`Um]b['?YmVcUfX'\deltaglfi a Ybhg"'9X"'K "'A]hWXY``"'BYk 'Ncf_. Bcfhcb"'I BGK '@]VfUfmG'+, \$\mu557\%5!\%6

 $6Yf_{ck} \ [mz'5 Ufcb': "'f&$\%L''H\Y'=a dfcj]g]b[\ 'A \]bX. \ '7c[b]f]cb'UbX'7fYUfj]fmi]b'fhY'A i g]WU'`A ca Ybf'fC | ZcfX' | b]j Yfg]fmiDfYgg"$

 $6Yf]bYf\ddot{z}DUi `: "'f\% - (\xi''H\]b_]b[']b'\Unn. H\Y']bZ]b]hY'UfficZ]a dfcj]gUh]cb'''7\]WU[c.'I b]j Yfg]hmicZ7\]WU[c]$

7`Uf_Yž'9f]W''f&\$\$('L'''9a d]f]WU``gh X]Yg`]b`aig]WdYfZcfa UbWY'''9a d]f]WU``Aig]Wc`c[m'

7 cc_žB]W\c`\Ug`UbX`9f]W7`\Uf_Y`ffYXg"\tz`\W\UdhYf`) "`BYk `Mcf_.`Cl ZcfX`Lb]j Yfg]miDfYgg`fUj U]`\UV`Y`\Ug`Y6cc_ j]U`LBGK ``]VfUfmt:7 cc_žB]W\c`\Ug"`f&\$% \t''`6YmcbX`h\Y`GWtfY.`A i g]WUg`dYfZcfa UbW\"'BYk `Mcf_.`Cl ZcfX Lb]j Yfg]miDfYgg"

7 fi $\frac{1}{2}YXZK$]`"f% , ' $\frac{1}{2}UCWUC$ fbUa $\frac{1}{2}UCWUC$ fbUa $\frac{1}{2}UCWUC$ fbUa $\frac{1}{2}UCWUC$ fbUa $\frac{1}{2}UCUC$ for $\frac{1}{2}U$

8c[UbhUb!8UW_ž'A]bY"'f&\$%&\z"'H\Y'UfficZfYgYUf\\\`]b``]jY'aig]\wdYfZcfaUb\\"'Aig]\wDYfZcfaUb\\"FYgYUf\\\`]c`")ž'(!(, "

: UV]Ubž8"žH]a a YfgžF "žGW\i VYfhž9"`fPXgłžf&\$%(Ł"`9I dfYgg]j YbYgg`]b`a i g]WdYfZcfa UbW\"`C I ZcfX. C I ZcfX I b]j Yfg]mbfYgg"

: UV]Ubž8"'f&\$\$' Ł"'6UW\DYfZcfa UbW\DfUWf]W\'% ()!% +) ž'U'Wca dfY\Ybg]j Y'fYj]Yk 'cZgci bX'fYWcfX]b[g UbX'`]hYfUhi fY"'5`XYfg\chž'< Ubhgž'9b[`UbX/6i f`]b[hcbž'J Yfa cbh'5g\[UhY"'I BGK '@]VfUfm@Yj Y``&'< Y`d NcbY'fJ '+, \$#657#7!*- Ł

; UfWJUžA Ubi Y`"'f%-, (Ł"5 Wca d`YhY hfYUhjgY`cb'h\Y`UfhcZg]b[]b["'9X"'8cbU`X`DUgW_Y"'BYk 'Mcf_. '8U

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

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

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Hy'Yd\cby'9| hy'fbu''Gi ddcfhcb'-',) '' ' ' %cf'Ya U]''h\Ya 'cb'Y! hy'fbu'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"'=Z'mci
UfY'i bUV'Y'hc'gi va]hmci f'Ugg][ba YbhXi Y'hc'U'ZJi 'hk]h\ 'Hi fb]h]b'mci 'a UmUdd'mZcf'Ub'Y! hy'bg]cbž'Vi hmci
a i ghfYhJ]b'mci f'h]W_Yhbi a VYf'Zfca '9! hy'fbU''Gi ddcfhfU'cb['k]h\ 'Ubmch\Yf'fy'Yj UbhXcW a Ybhgt'hc
]bWi XY'Ug'Yj]XYbW' 'hc'gi ddcfhmci f'Y! hy'bg]cb'Udd']WUh]cb"'=Zmci 'Ya U]''9! hy'fbU''Gi ddcfhmci 'k]'`
Ui hca Uh]WJ'`mfYW']j Y'U'h]W_Yhbi a VYfZ'Vi h]Zmci 'hY'Yd\cbY'mci 'k]``bYYX'hc'gdYW]Z]WJ'`mUg_'Zcf'cbY''
Hi fb]h]b'U'gc'dfcj]XYg'i dXUhy'g'cb'h\Y]f'gmghYa 'ghUh' g'cb'Hk]hyf''

; YbYfU`mž'UggYgga YbhiHug_g'a i ghVY'gi Va]hhYX'Y`YVWfcb]\WJ``mij]U'Y]h\Yf'Hi fb]h]b'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`hYfbUh]j Y'gi Va]gg]cb'XYHJ]`g"

cfi]bZcfa Uhjcbicbi\ckihcigi Va]hUgg][ba Ybhgicbi]bYij]UiA ccXiY.i\hdg.#gh XYbhi bgk "YXi "Ui #\ck! gi Va]hUgg][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"`±hWJb`hU_Y`a Ubm Zcfa gžZfca `XY`]VYfUhY`W\YUh]b['hc`UWW]XYbhJ``mWcdm]b['Zfca `U`gci fWY`k]h\ci hUW_bck `YX[Ya Ybh'

IBGK [fcidg'd'U[]Uf]ga]bhc'h\Y'Zc``ck]b['WUhY[cf]Yg.

 $7 \text{ cdm}b[...i g]b[...h\Y.gUa Y.cf.j Yfmig]a] \Uf'k cfXg'hc'h\Y.cf][]bU''hYl h'cf']XYU'k]h\ci h'U\V_bck `YX[]b[...h\Y.cf][]bU''hYl h'cf']XYU'k]h'cf']$

- 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 ž'ch\Yfg'k]``VY'bYk"'; U]b]b['U'gc`]X'i bXYfgHJbX]b['cZU``h\YfY`UhYX'UgdYWng'cZ9@+69'k]``\Y`d'mci 'a U_Y'h\Y'a cghicZmci f'ghi X]Yg'UhI BGK "'\\hd.##qi VYWfi |XYg"`]VfUfm'i bqk "YXi "Ui #\`]qY#JVci hY`]qY

5 WUXYa]W = b Zcfa Uh cb

: cf'YggYbhJU`gh XYbhJbZcfa UhJcb'fY`UhJb['bc.

- fYei Yghg 'Zcf'Yl hYbg]cb/
- `UhY`gi Va]gg]cbg`[i]XY`]bYg/
- fYi]Yk 'cZa Uf_g/
- I BGK '< YU'h\ 'UbX'GUZYhm'dc`]\\\Yg/
- YI Ua]bUhcb dfcWXi fYg/
- qdYWJU``Wcbq]XYfUHjcb`]b`H\Y`Yj YbhcZ]``bYgg`cf`a]gUXj Ybh fY/
- gh XYbhYei]mrUbX'X]qUV]`]m/
- UbX ch\Yf YggYbhJU`UWUXYa]W]bZcfa UhJcbžgYY

\hdg.#k k k "Ufhg"i bgk "YXi "Ui #W ffYbhgh XYbhg#UWJXYa]W]bZcfa Uh]cb#dfchcWc`g![i]XY`]bYg#

.

⇒a U[Y'7fYX]h

D\chc'Vm? UVcca d]Wg'"Wca 'Zfca 'DYI Y`g

7F = 7CG

7F = 7CG Dfcj]XYf 7cXY. \$\$\$-,;

5W_bck `YX[Ya YbhcZ7ci bhfm

 $K_{Y'UW\underline{b}ck} YX[Y'hY'6YXY[U''dYcd'Y'k \c'UfY'hY'ffUX]h]cbU''W ghcX]Ubg'cZhY''UbXg'cb'k \]WX'I_BGK_{Ybg]b[hcb'WJa_di_q']q''cWJhYX'''$