

ARTS3132

6UgYX'cb'U'Hfi Y'Ghcfm'H\YUlfYg'cZh\Y'FYU`

GYa YghYf'CbY''##'&\$%

7ci fgY Cj Yfj]Yk

GHJZ 7 cbHJWh8 YHJ]`g`

'7cbj Ybcfg'

B Ua Y	9a U]`	5j U]`UV]`] m	@cWUh]cb	D\cbY
8 f 7 Ufc`]bY K U_Y	<u> </u>		Fcca &(*9ž @YjY`&ž FcVYfh KYVghYf 6i]`X]b[-',)

GW.cc`7cbhJWh =bZcfa Uhlcb

Fcca " %&ž~Yj Y~" FcVYfhK YVghYf6i]X]b[

D\cbY. f\$&Ł'-',) '(,)*

9a U]`. gUa 4 i bgk "YXi "Ui

K YVq]hY. '\hdq.##qUa "Ufhq"i bqk "YXi "Ui

H\Y'GW\cc``cZh\Y'5ffg`UbX'A YX]U'k ci `X``]_Y'fc'F YgdYWM ``m5W_bck `YX[Y'f\Y'H\Y'HfUX]f]cbU``7 i gfcX]Ubgž h\Y'6YXY[U``fP Ybg]b[fcb`WUa di gŁž; UX][U``fP]fmUbX'5fhi/ '8Yg][b'7Ua di gYgŁ'UbX'f\Y'B[i bbUk U` dYcd`Y'fbi gffU`]Ub'8YZYbW': cfW'5WUXYa m]b'7UbVYffUŁ'cZh\Y``UbXg'k\YfY'YUW\'WUa di g'cZl BGK ']g `cWJhYX"

5 h Y b X U b W F Y e i] f Y a Y b h g

5 'ghi XYbh']g'Yl dYWYX'hc'UhhYbX'U```WUgg'WcbhUWh\ci fg'Zcf'U'ZUWY!hc!ZUWYfl &: Ł'cf'V'YbXYX'Wci fgY'UbX Wca d'YhY'U```UWYj |h|Yg'Zcf'U'V'YbXYX'cf'Z ``mcb`]bY'Wci fgY"

5 'ghi XYbhik \c'Uff]j Yg'a cfY'h\Ub'%) 'a]bi hYg'`UhY'a Um'VY'dYbU`]gYX'Zcf'bcb!UhhYbXUbWY'''⊋gi W\'U'dYbU`hm]g']a dcgYXž'h\Y'ghi XYbha i gh'VY']bZcfa YX'j YfVU``m'Uh'h\Y'YbX'cZWUgg'UbX'UXj]gYX']b'k f]h]b['k]h\]b'&(\ci fg''

₹Uʻghi XYbhYl dYf]YbWgʻ]`bYggža]gUXj Ybhi fYʻcfich\YfʻcWW ffYbWYʻh\Uha U_YgʻUVgYbWʻZfca ʻU WUgg#UWfj]hmi bUj c]XUV`Yžʻcf`Yl dYWgʻhcʻVY`UVgYbhZfca ʻUʻZcfh\Wca]b[ˈWUgg#UWfj]hmž'h\Ymg\ci `XʻgYY_ dYfa]gg]cbʻZfca ʻh\Yʻ7 ci fgYʻ5i h\cf]|mžʻUbX`k\YfY`Udd`]WUV`Yž'h\Y]f`fYei Yghg\ci `X`VY`UWWca dUb]YX`VmUb cf][]bU`ʻcf`WffhZ|YX`WcdmcZUʻa YX]WU``WYfhZ|WUhY`cf`ch\Yf`Zcfa `cZUddfcdf]UhY`Yj]XYbWY"

5.7 ci fgY 5 i h\cf]hma UmYI W gY 'U'ghi XYbhZica 'WUggYg'cf'UWjj]hJYg'Zcf'i d'hc'cbY'a cbh\" < k Yj Yfz'h\Ym a UmUgg][b'UXX]hJcbU``UbX#cf'U'hYfbUhJj Y'HUg_g'hc'Ybgi fY 'Wca d`]UbW'" 5.7 ci fgY 5 i h\cf]hm'Wcbg]XYf]b['h\Y [fUbh]b['cZUVgYbW'a i gh'VY'gUhJgZJYX'U'ghi XYbhk]``gh]``VY'UV'Y'hc'a YYhh\Y'Wci fgY'g'`YUfb]b['ci hWca Yg UbX#cf'j c'i a Y'cZ'YUfb]b["'5'ghi XYbhgYY_]b['Uddfcj U`'hc'VY'UVgYbhZcf'a cfY'h\Ub'cbY'a cbh\'a i gh'Udd'm]b'k f]hJb['hc'h\Y'8YUb'UbX'dfcj]XY'U``cf][]bU`'cf'WYf]hZYX'gi ddcfh]b['XcW a YbhUhJcb"

: cf'a cfY']bZcfa Uhjcb'UVci hih\Y'UhhYbXUbWY'dfchcWc`g']b'h\Y': UWV`hmcZ5fhg'UbX'GcWJU`GWJYbWYg. \http://dfchcWc`g![i]XY\]bYg#

.

5 WUXYa]W = Zcfa Uh]cb

: cf`YggYbhJU``ghi XYbh`]bZcfa UhJcb`fY`UhJb['hc.`fYei Yghg`Zcf`Yl hYbg]cb/fYj]Yk 'cZa Uf_g/cWW dUhJcbU``\YU`h\UbX`gUZYhm/Yl Ua]bUhJcb`dfcWYXi fYg/gdYWJU``Wcbg]XYfUhJcb`]b`h\Y`Yj YbhcZ]``bYgg`cf`a]gUXj Ybhi fY/

7 ci fgY 8 YHJ]`g 7 fYX]hDc]bhg * Gi a a UfmcZh\Y 7 ci fgY

5ggYgga Ybh

Gi ddcfh'GYfj \Wyg'

 $: cf']bZcfa Uh]cb'UVci h'ck'hc'k f]hY'YggUmg'UbX'XcW a Ybhmci f'fYZYfYbWYgž'Wcbgi `hH\Y'@YUfb]b['7YbhfY'gk f]h]b['[i]XYg'Uh$

\hdg.#gh XYbh'i bgk "YXi "Ui #\ggUm\UbX!Ugg][ba Ybhk f]h]b[

FYZYfYbW[b[

D`YUgY`i gY`7\]WU[c`5i h\cf!8UhY`fYZYfYbW]b['gmghYa 'f%+h\'YX]h]cbŁ"

H\Y`E i]\<u>W</u>'; m]XY']g'Uj U]`UV`Y

\YfY. <u>\hd.#k k k "W\]WU[ca Ubi U`cZghmY"cf[#cc`gSWhUhcb[i]XY#WhUhcb![i]XY!&"\ha`</u>

H\Y': i ``'; i]XY']q'Uj U]`UV`Y'\YfY'j]U'h\Y'I BGK

@VfUfm'

\hd.#k k k "WX]WU[ca Ubi U`cZghmY"cf["k k k dfcl n%"\VfUfm"i bgk "YXi "Ui #/cc #/X%+#fcbha UhhYf#cW\ha ``

.

5ggYgga YbhHUg_g

5ggYgga Ybh'HJg_	K Y][\h	8i Y [.] 8UhY	Gh XYbh@YUfb]b[Ci hWca Yg 5ggYggYX
F YgYUfW\`DfcYWhDfcdcgU``	&\$I	&) #\$' #&\$% `%%) - `DA	%Ž Ž)
; fci d'DfYgYblUljcb'	' \$ı	⇒ WUggž'K YY_g'' !, ž'%\$!%%	&Ž Ž(
A U'cf'F YgYUfW. Dfc YWh f9ggUmcf'7 fYUhjj Y'K cf_Ł') \$1	\$%#\$*#&\$%_'%%) - 'DA	%ž&Ž Ž)

5ggYgga Ybh'8YHJ]`g

5ggYgga Ybh'% 'F YgYUfW\' Dfc YWhDfcdcgU'

GhUfhXUhY. Bch5dd`]WUV`Y

8 YHU]`g. '8 YgWf]dh]cb. 'H\]g'UggYgga Ybh'Ug_g'mci 'hc'XYj]gY'U'DfcdcgU``cZ) \$\$!)) \$'k cfXg'h\Uh'dfYgYbhg'U fYgYUfW\'ei Ygh]cb'UbX'd`Ub'h\Uhk]``dfcj]XY'U'gHUfh]b['dc]bh'UbX'[i]XY'Zcf'mci f'A U'cf'F YgYUfW\
Dfc'YWf': YYXVUW_. 'F i Vf]W]bX]WUh]b[''Yj Y``cZdYfZcfa UbW\'U[U]bghYUW\'UggYgga Ybh'Wf]hYf]Už'k f]hhYb
Zcfa Uh]j Y'ZYYXVUW_ž'UbX'dYfWbhU[Y'[fUXY"

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

: i fh\Yf`]bZcfa Uh|cb`]bWi X]b[`UggYgga Ybh'Wf]hYf]Už'gi Va]gg]cb`]bghfi Wf]cbg`UbX`fUh|cbU`Y`UfY`dfcj]XYX`cb A ccX`Y"

Hi fb]hjb gYhjb[. H\]g Ugg][ba Ybh]g gi Va]hYX h\fci [\ Hi fb]hjb UbX gh XYbhg Xc bchgYY Hi fb]hjb

5ggYgga Ybh&; fci d DfYgYbhUh]cb

GHJfh:XUhY.

@Yb[h\.'W" \$ a]bi hYq

8 YHJ]`g. '8 YgWf]dh]cb. 'H\]g'UggYgga Ybh'Ug_g'mci 'hc'k cf_']b'ga U``'[fci dg']b'cfXYf'hc'dfYgYbh'U'W' '\$!a]bi hY 'Wf]h]WU'`UbX#cf'WfYUh]j Y'fYgdcbgY'hc'gYhhcd]Wg'cb'a UhYf]U``h\UhYI hYbXg'Wci fgY'WcbhYbh''H\Y [fci d'dfYgYbh'Uh]cb']g'k cff\\'%) i 'UbX'YUW\']bX]j]Xi U''g'Wcbhf]Vi h]cb'hc'h\Y'dfYgYbh'Uh]cb']g'U'gc'k cff\\%) i ": YYXVUW_. 'F i Vf]W]bX]WUh]b[``Yj Y``cZdYfZcfa UbW''U[U]bghYUW\'UggYgga Ybh'Wf]hYf]Užk f]hhYb Zcfa Uh]j Y'ZYYXVUW_ž'UbX'dYfWbhU[Y'[fUXY"'9UW\'gh XYbh'k]``'fYW']j Y'ZYYXVUW_cb'h\Y'cj YfU``'[fci d dfc YWfUg'k Y``'Ug'cb'\]g'cf'\Yf'ck b'Wcbhf]Vi h]cb"

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

: i fh\Yf`]bZcfa Uh]cb`]bWi X]b[`UggYgga YbhWf]hYf]Užgi Va]gg]cb`]bghfi Wf]cbg`UbX`fUh]cbU`Y`UfY`dfcj]XYX`cb A ccX`Y"

Hi fb]h]b gYh]b[. H\]g]g bchU Hi fb]h]b Ugg][ba Ybh

5ggYgga Ybh' . A U'cf F YgYUfW. Dfc YWhfPggUmcf 7fYUhjj Y K cf_Ł

GhUfh XUhY.

@Yb[h\.'&ž)\$\$'k cfXq

8 YHU]`g. '8 YgWf]dh]cb. ': cf'h\ Y`A U'cf'F YgYUfW\'Dfc YWfmci 'a i ghgi Va]hcbY'cZh\ Y'Zc``ck]b[.fl\25 'gY`Z XYj]gYX`YggUmf\&z) \$\$'k cfXg\!''C F.f\&\:5 'd`Umg\\f]dhcf'ch\ Yf'd]Y\\'cZk f]h]b['Zcf'dYfZcfa Ub\\'f\&z) \$\$ k cfXg\!''H\]g']g'h\ Y`Z]bU``UggYgga Ybh'HUg_'': YYXVU_. 'Fi Vf]\\]bX]\\Uh\f]bY]\\Uh\\f]H\Yf]U\Zgi a a Uh]j Y`ZYYXVU_ZUbX'dYf\\YbH\[Y`[fUXY"`

5XX]hcbU`XYhJ]q.

: i fh\Yf']bZcfa Uh\cb']bWi X]b['UggYgga Ybh\Wf]hYf]Už'gi Va]gg]cb']bglfi \Wf\cbg'UbX'fUh\cbU'Y'UfY'dfcj]XYX'cb A ccX'Y''

 $\label{thm:limit} \begin{tabular}{ll} Hi & fb \end{tabular} $$ $H \ fb \end{tabular} $$ fo \end{tabular} $$ Hi & fb \end{tabular} $$ fo \end{tabular} $$ fo \end{tabular} $$ fo \end{tabular} $$ Hi & fb \end{tabular} $$ fo \en$

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

Gh XYbhg UfY Yl dYWYX hc di hh\Y]f bUa Yg UbX gh XYbhbi a VYfg cb Yj YfmdU[Y cZh\Y]f Ugg][ba Ybhg"

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'<u>Yl hYfbU'hY'hgi ddcfh4 i bgk "YXi "Ui"</u>"'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'hc'gi Va]hmci f'Ugg][ba YbhXi Y'hc'U'ZJi 'hk]h\'Hi fb]h]b'mci 'a Um'Udd'm\Zcf'Ub'YI hYbg]cb\ZVi hmci
a i ghfYhJ]b'mci f'h]\W_Yhbi a VYf\Zfca '9I hYfbU''Gi ddcfhfU'cb['k]h\'Ubmch\Yf'fY'Yj UbhXcW'a Ybhgt'hc
]bWi XY'Ug'Yj]XYbW' hc'gi ddcfhmci f'Yl hYbg]cb'Udd']\WJh]cb'''\=\maintention
Uh\WJ'`mfYWY']j Y'U'h]\W_Yhbi a VYf\ZVi h]Zmci 'hY'Yd\cbY'mci 'k]``bYYX'hc'gdYW]\Z\WJ'`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 YbhitUg_g'a i ghiVY'gi Va]lth/X'Y`YWfcb]WU`mj]U'Y]th\Yf'Hi fb]h]b'cf'U'A ccX`Y Ugg][ba Ybh''=b']bgtUbW'g'k \YfY'th\]g']g'bchdcgg]V`Yž']hk]```VY'gtUhYX'cb'mci f'Wci fgY'g'A ccX`Y'g]hY'k]th\U`hYfbUh]j Y'gi Va]gg]cb'XYhU]`g''

@UhY 5ggYgga YbhDYbU`h]Yg

5b'UggYggYX'HUg_']g'XYYa YX``UhY']Z]h']g'gi Va]hhYX'UZhYf'h\Y'gdYW]Z]YX'h]a Y'UbX'XUhY'Ug'gYhci h']b'h\Y Wti fgY'@YUfb]b['A UbU[Ya YbhGmghYa 'f@A GŁ"

K cf_'gi Va]hhYX'Zci fhYYb'fl%(Ł'XUmg'UZhYf'h\Y'Xi Y'XUhY'k]``VY'a Uf_YX'UbX'ZYYXVUW_'dfcj]XYX'Vi hbc'a Uf_ k]``VY'fYWcfXYX"' ₹h\Y'k cf_'k ci `X'\Uj Y'fYWr]j YX'U'dUgg'a Uf_'Vi hZcf'h\Y``UhYbYgg'UbX'h\Y'k cf_']g'U Wca di `gcfm'Wci fgY'Wca dcbYbhz'U'gh XYbh'k]``VY'XYYa YX'hc'\Uj Y'a Yhih\UhfYei]fYa Ybh''H\]g'XcYg'bch Udd`mhc'U'hUg_'h\Uh']g'UggYggYX'Vi h'bc'a Uf_']g'Uk UfXYX"

K cf_'gi Va]hh/X'hk YbhnlcbY'f&&XUmg'UZhYf'h\Y'Xi Y'XUhY'k]``'bchVY'UWWdhYX'Zcf'a Uf_]b['cf'ZYYXVUW_UbX'k]``'fYWY']j Y'bc'a Uf_'cf'[fUXY"'=Zh\Y'UggYgga YbhHUg_']g'U'Wca di `gcfmWca dcbYbhcZh\Y'Wci fgY'U ghi XYbhk]``'Ui hca UhJWU``mZJ]`'h\Y'Wci fgY"

GdYWJU`7cbg]XYfUhJcb55dd`]WUhJcbg

 $\label{eq:linear_continuity} $$Mc_i = W_0 - W_$

G]W_bYggža]gUXj Ybhi fY'cf'ch\Yf'W]fW a ghUbWrg'VYmcbX'mci f'Wcbhfc``a Um

ł DfYj Ybhimci Zfca Wca d`Yhlb[U.Wci fqY fYei]fYa Ybhž

ł? YYd mci Zfca "UthYbX]b["Ub UggYggUV"Y "UWnji]tmž

ł Ghod moi gi Va]hh]b['UggYggUV'Y k cf_ Zcf'U Wci fgYž

ł `G][b]Z]\WbhmUZZY\Wimci f`dYfZcfa Ub\Wr`]b`UggYggUV`Y`k cf_ž`VY`]h'U`Zcfa U``YbX!cZgYa YghYf`Yl Ua]bUh]cbž`U \WUgg`hYghž`U``UVcfUhcfmhYghž`U`gYa]bUf`dfYgYbhUh]cb`cf`Ubmch\Yf`Zcfa 'cZUggYgga Ybh'

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'

±DUddfcdf]UhY`dUfUd\fUg]b[.'W\Ub[]b['U'ZYk'kcfXg'UbX'd\fUgYg'k\]`Y`acghmfYhJ]b]b['h\Y`cf][]bU`ghfi WhifY`UbX`]bZcfaUh]cb`k]h\ci hUW_bck`YX[YaYbh'H\]g'U`gc'Udd`]Yg`]b'dfYgYbhUh]cbg'k\YfY`gcaYcbYdUfUd\fUgYg`Ubch\Yf'g`]XYUg`cf'kcfXg'k]h\ci hWfYX]h''±iU`gc'Udd`]Yg`hc'd]YW]b['hc[Yh\Yf'ei chYg'UbXdUfUd\fUgYg`]bhc'U'bYk'k\c`Yžk]h\ci hfYZ/fYbW]b['UbX'U'ghi XYbh'g`ck b'UbU`mg]g`hc'Vf]b['h\Y`aUhYf]U`hc[Yh\Yf''

7 c``i g]cb. 'k cf_]b['k]h\ 'ch\ Yfg'Vi h'dUgg]b['c\Z'h\ Y 'k cf_'Ug'U'dYfgcb'g']b\X]j]\Xi U``k cf_"'7 c``i g]cb'U`gc]b\Wi XYg'dfcj]\X]b['mci f'k cf_'hc'Ubch\ Yf'ghi XYbh\ VYZcfY'h\ Y 'Xi Y 'XUhYzcf'Zcf'h\ Y' di fdcgY'cZh\ Ya d`U[]\Uf]g]b['Uh\Ubmh]a Yz'dUm]b['Ubch\ Yf'dYfgcb'hc'dYfZcfa 'Ub'U\WUXYa]\Wh\Ug_z'ghYU']b['cf'U\\ello i]f]b[Ubch\ Yf'dYfgcb'g' U\WUXYa]\Wk cf_'Ub\X'\ello dm]b[']hz'c\ZYf]b['hc'\\ello a d`YhY'Ubch\ Yf'dYfgcb'g' k cf_'cf'gYY_]b[d\ubara Ybh\Zcf'\\ello a d`Yh\beta d`Yh\beta \underset \

±bUddfcdf]UhY`W]hUh]cb.`7]h]b[ˈgci fW/gˈk \]WX`\Uj Y`bchVYYb`fYUXžk]h\ci hUW_bck`YX[]b[ˈh\Y`″gYWcbXUfm″gci fW/Zfca k \]WX`_bck`YX[Y`cZh\Ya`\Ug'VYYb`cVhU]bYX"

8 i d`]\WUh]cb`ff`gY`Zld`U[]\Uf]ga "Ł`gi Va]\h]b[`mci f`ck b`k cf_ž]b`k \c`Y`cf`]b`dUfhžk \YfY`]h`\Ug`dfYj]ci g`m VYYb`dfYdUfYX`cf`gi Va]\hYX`Zcf`Ubch\Yf`UqqYqqa Ybhcf\Wci fgY`UhI_BGK_`cf`Ubch\Yf`i b]\Yfq]\m"

7 cffYWhfYZYfYbWb[dfUWhWyg.

• VYHYfa UbU[Ymcifh]a Y

7ci fgY GWX YXi `Y

J]Yk 'WUgg'ha YHUV'Y

H]a YtUV`Y

8 UhY	HmdY	7 cbhYbh	
K YY_'%'&*': YVfi Ufm!'(A UfVX	GYa]bUf	+blfcXi Whjcb. 'H\YUlrfY'UbX'h\Y'FYdfYgYbhUhjcb'c h\Y'FYU'	
		FYUX]b[g	
		A Uffijbž:7Ufc`"`&\$&&"`"H\YUlfY`cZh\Y`FYU`.`5b CjYfj]Yk""`FZW\$fdWaXfZWDW\$^"6Ug]b[ghc_Y. DU`[fUjY`AUWa]``Ub"`%-&%"	
		FY]bY`hz`>UbY``Y"`&\$\$-"`"H\Y`Dfca]gY`cZ 8cWaYbhUfm'"`9WfDW\$^,6aUg_WfSckFZW\$fdW BSefS`VBdWeWf"`9X]hYX`Vm'5`]gcb`:cfgmh\`UbX 7\f]g`AY[gcb"`6Ug]b[ghc_Y.`DU`[fUjY`AUWa]``Ub" *-&'"	
K YY_`&.`) `A UfVX`!`%% A UfVX	GYa]bUf	FYU`'9h\]Wg.'7cbgYbhž'7cbgi`HJh]cbž DUfh]W]dUh]cb	
		FYUX]b[g	
		@U: fUbWYžA Ufm":&\$% ":"H\Y`8]gUddYUf]b[:: ci ft\ K U``.`@Uk ž9t\]WgžUbX`9I dYf]Ybt]U``H\YUffY"" HS`VWdT[f <agd fs`v<br="" s^ax7`fwdfs[_="" w="">FWUZ`a'aYk >Si '%) f1 Ł')\$+-),&"</agd>	
K YY_" ."‰"A UfWX"!"% A UfWX	GYa]bUf	FYU`GY`j Yg.5i hcV]c[fUd\]WU`DYfZcfa UbW	
A OTVW		7 UgY'Ghi X]Yg.'@YU\'DifWY``ž'4aj fZWBa`kf%-+Ł/K]``]Ua'MUb[ž'4'aaV>[`]ef%#&\$%(Ł/>UaYg@cb['UbX'AUfW'g'MciggYZz'I[``WdeS`V>aeWdef&\$%&Ł	
		FYUX]b[g." <yxxcbž8y]fxfy""&\$\$, """dc`]h]wg`fcz<br="">GY`ZL`H\Y`GiVYWfcZ5ihcV]c[fUd\m"" 3gfaT[aYc6bZkS`VBWdXad_S`UW'@cbXcb. DU`[fUjY""&\$-)&"</yxxcbž8y]fxfy""&\$\$,>	
		; fY\Ubž< Y`YbUžUbX`9XkUfX`GWXYYf"`&\$%*" "GdYU_]b[ž5Wf]b[žBUffUf]b[.`K]``]Ua`MUb['g`G`]XY G\ck`DYfZcfaUbWYg""`+b`I[^{S_KS`Y,`EfaqWeaX >ahWS`V6W8fZ"`GmXbYm`BYkGcih\`DfYgg"`&+\$"	
		A Ui ZcfržA UfW'&\$\$\$"'"I bgYhn]b['BUffUh]jYg. GiVjYfg]jYA]a]Wfm]b'5ighfU`]Ub'5Vcf][]bU`Gc`c D]YWfg""'3`f[baVWe'%('f&L'%\$)-%\$"	

		GHYd\Ybgcbž'>Ybb"'&\$%*"'"K]bb]b['UbX#cf'@cg]b[. H\Y'DYf]'g'UbX'DfcXi Wg'cZ+bgYW f]hm]b DcghXfUa Uh]W5i hcV]c[fUd\]WU''DYfZcfa UbW''"' FZWSfdW <agd 'f&ł'&%'-&-"<="" s^*,="" th=""></agd>
K YY_'(.'% 'A UfW\'!'&) A UfW\	GYa]bUf	FYU`: Ua]`]Yg'UbX'7caaib]h]Yg. +bhYf[YbYfUh]cbU`DYfZcfaUbWY
		7 UgY'Ghi X]Yg. 'E i UfUbh]bYžEgeS`S`V 6 ScbW f&\$\$*L/G\Y'G\Y'DcdžFWefS_Wff&\$%\$L/Fcg`mb CUXYgž: W°al 9 aaVTkW`: Sbbk 4 [dfZVSk'f&\$%) L
		FYUX]b[g.' <uff]gž; yfu`x]by"`&\$%\$"`"gigub`ubx<br="">8UffYb.'H\Y'5ddYUfUbWY'cZ5ih\Ybh]W]mm'"' BW&ad_S`UWDWeWSdJZ%''f(Ł'(-%)"</uff]gž;>
		A Ugg]Yž'9`YUbcf"`&\$%*"`"@cjY'Gcb[g'UbX 5k_kUfXbYgg.'Bcb!DfcZYgg]cbU``DYfZcfaYfg'UbX 5ZZYWNjY'aUVcif""'BWXXad_S`UWBSc6V[Y_'\;%%)+)"
K YY_") . "&* "A UfWX "! "%	GYa]bUf	FYU`Jc]WYg. BUhi fU`]ga 'UbX'JYfVUh]a
5df)`		7 UgY'ghi X]Yg'; Yf\Ufhi< Ui dha UbbžFZW I WShWde f% - &Ł/DYhYf'7\YYgYa Ubžj Uf]ci g/UbX 5`YW_m6`mh\Yžj Uf]ci g"
		FYUX]b[g
		Gb]XYfaUbž5`]gU"'&\$%("'"GhU[Y': fY][\h'@UVcif'UbXh\Y'FYgdcbg]V]`]hmcZ7Ud]hU`]ga`]b'; Yf\Ufh <uidhaubb'g'fzwiwshwde""??avwd 6ds_s')+'flł'%)-',"<="" th=""></uidhaubb'g'fzwiwshwde""??avwd>
		DU[Yhž8YfY_"'%, +'"'JYfVUh]a 'H\YUhfY'.'CfU` <]ghcfm'UbX8cW'a YbhUfm'HYW\b]eiYg""'@W FZWSfdWCgSdfWdk''ff%&k''%+-'*"
		K U_Yž'7 Ufc`]bY"'&\$% "' " < YUXd\cbY'J YfVUlja H\YUlfY.'A Yh\cXgž'<]ghcf]Ygž; YbfYgž'H\Ycf]Yg" " ' @W'FZWSfdWCgSdWdk'&-'f('E''&%-')"
6fYU'&'5df]`'!', '5df]`	GYa]bUf	
K YY_'*.'- '5df]`'!'%) '5df]`	[GYa]bUf	FYU``J]c`YbWY.`F]chgžFYYbUWhaYbhž'UbX FYhY``]b[
		7 UgY'gh X]Yg'5bbU'8YUjYfY'Ga]h\žFi [{YZfl>ae 3`YWWe#++\$f%-'\L/>YfYam8Y``Yfz'4Sff'WaX AdYdMShWf&\$\$%L/UbX'Fcg`mb'CUXYgz'Efaq WeaX >ahWS`V:SfWf&\$\$-L
		FYUX]b[g

	? U`Vž'>cbUh\Ub"`&\$\$%":"8cWaYbhUfmGc`c DYfZcfaUbWY.`H\Y`Dc`]hJWg`cZh\Y`A]ffcfYX`GY`Z'''` FZW\$fWd' %fl L`% -&-" ?]hUaifUž'?UhJY"`&\$%\$"`"FYWfYUhJb[`7\Ucg.`>YfYam 8Y``Yf'g`4SffWaXAdYdW\$hW"`=b`:[efad[US^

ı	
	Mci b[žGh Ufh"&\$\$-""D`Umb[k]h\8cWa YbrUfm
	H\YUlfY.'3S^efUbX'FS][`Y5SdWaX4STk""FZWSfdW
	D WeWSdJZ; fWa Sf[a S^&) fl/2 +&-, +"