

IEST5012

9bj]fcba YbhU`A UbU[Ya YbhDfc YWhDUdYf

HYfa "Hk c" ## "&\$%-

7ci fgY[·]Cj Yfj]Yk

GHJZZ:7cbHJWh:8YHJ]`g`

7cbj Ybcfg

B Ua Y		

7ci fgY 8YHJ] g

7 fYX]hDc]bhg '%'

Gi a a UfmcZh\Y'7ci fgY

H\Y'[cU`cZh\]g'Wci fgY']g'hc'YbUV'Y'ghi XYbhg'hc'k f]hY'Ub'Ybj]fcba YbhU``a UbU[Ya Ybhdfc'YWidUdYf'VUgYX cb'a UhYf]U``[Uh\YfYX'Xi f]b['h\Y'9bj]fcba YbhU``A UbU[Ya YbhF YgYUfW\'±bhYfbg\]d'f\pGH) \$\$(\E'UbX']h]g WYUf'mfY`UhYX'hc'h\Y'gi V'YWia UhhYf''Wcj YfYX']b'h\]g'Wci fgY'''H\Y'Wci fgY'XcYg'bcha U]bhU]b'fY[i `Uf'm gW\YXi `YX'WUggYg''' < ck Yj Yf'ghi XYbhg'UfY'fYei]fYX'hc'dUff]W]dUhY']b'cfU``dfYgYbhUh]cbg'cb'h\Y'dfc'YWh dUdYfg'Uhh\Y'YbX'cZh\Y'h\fa "'\DZcfa U``a YYh]b[g'a UmVY'Wcbj YbYX'dYf]cX]\W\``mk]h\'h\Y'Wci fgY WccfX]bUhcf'gc'h\Uh[YbYfU``X]gW gg]cbg'UVci hh\Y'dfYdUfUh]cbg'Zcf'h\Y'dUdYf'UbX'h\Y'cfU``dfYgYbhUh]cb WUb'VY'\Y`XZ'UbX'dfc[fYgg']b'fYgYUfW\']bZcfa U``mUggYggYX"'H\fci [\ci hh\Y'hYfa 'cZh\Y'dfc'YWhighi XYbhg k]``VY'\X'Z'bU``dfc'YWighi XYbhg k]```VY'k cf_]b['k]h\Y'Wci fgY'WccfX]bUhcf'UbX'UWUXYa]\WUXj]gcffgE'k \c'k]``fYj]Yk'dfc[fYgg']b dfYdUf]b['h\Y'ZbU'`dfc'YWhidUdYf'XcW'a Ybh'

 $H\ [g'WcifgY']g'UjU]`UV`Y'VmX]ghUbW'ghXm'$

7ci fgY @YUfb]b[Ci hWca Yg

% 5dd`]YX`fYgYUfWX`g_]``g`fl]hYfUh fY`fYj]Yk ž'Udd`]WUh]cb`cZa Yh\cXgž'XUhU`UbU`mg]gŁ &" 5bU`mg]g`cZXUhUž']bhYfdfYhUh]cb`UbX`fYdcfhik f]h]b[

HYUWX]b[GhfUhY[]Yg

GidYfj]g]cb'cb`m'

5ggYgga Ybh

5ggYgga Ybh'HUg_g'

5ggYgga Ybh'hUg_	K Y][\h	8i Y'8UHY	Gh XYbh@YUfb]b[Ci hWca Ygʻ5ggYggYX
Dfc YWiVf]YZ	% \$I	9Ufmi]b"h\Y"hYfa	%ž&
CfU`dfYgYbhJhjcb	&\$I	Hck UfXg [·] t\Y 'YbX 'cZHYfa	%ž&
:]bU``fYdcfh	+\$1	Hc:VY:bY[ch]UhYX	%ž&

5ggYgga Ybh'8YhJ]`g

5ggYgga Ybh% Dfc YWhVf]YZ

GHJfh:XUhY.

@Yb[h\. H65

8 YHJ]`g. 'H\Y`Vf]YZk ci `X`dfcj]XY`U`VUg]Wci h]bY`cZh\Y`Ufh]WY`hc`VY`XYj Y`cdYXž'h\Y`dchYbh]U``^ci fbU`fgŁ`Zcf]hhc`VY`gi Va]hhYXž'h\Y`h]a Y`]bY`Zcf`XUHU`UbU`mg]g`UbX`k f]h]b[ž'XYHJ]`g`cZk cf_`gh]```hc`VY`WcbXi WhYX`k]h\`h\Y dUfhbYf`cf[Ub]nUh]cb"F Yj]Yk`VmWcbj YbYf`UbX`dUfhbYf`cf["

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

 $F \ Yei \]fYa \ Ybhg`hc`VY`YghUV`]g\YX`]b`Wcbgi``hUh]cb`k \]h\ `mci f`Wci fgY`Wcbj Ybcfz`gi dYfj \]gcffgL`UbX`fY`Yj Ubh dUfhbYf`cf[Ub]gUh]cbg''`B cfa U``mh\Y`dfc YWhYI hYbXg`k cf_`U`fYUXmXcbY`Zcf`=9GH) $$(``=bhYfbg\]d"$

Hi fb]hjb gYhjb[. H\]g]g bchU Hi fb]hjb Ugg][ba Ybh

5ggYgga Ybh'& 'CfU` 'dfYgYbhUh]cb

GHJfh:XUhY.

8YhJ]`g. `C fu``dfYgYbhJh]cb`cZdfc[fYgg`a]X!gYa YghYf

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

H\Y`g\\cdYž`\Zcfa Uh'UbX`\\cbh\YbhicZmci f`df\Yg\Yb\Uh]cb`k]```\V\`X\Y\\]X\Y\`]b`\\cbik]h\`mci f gi d\Yfj]gcffg\z'\UbX`f\Y`j Ubhd\Ufh\Yf`cf[Ub]g\Uh]cbg"

Hi fb]hjb gYhjb[. H\]g]g bchU Hi fb]hjb Ugg][ba Ybh

5ggYgga Ybh' .:]bU`fYdcfh

GhUfh'XUhY.

@Yb[h\. Hc VY XYhYfa]bYX k]h\ mci f gi dYfj]gcffgŁ

8YHU]`g. `A U`cf`fYdcfh! `k f]HYb`Ug`dYYf`fYj]Yk YX`dUdYf`hc`ghmY`[i]XY`UbX`Zcfa UhUbX`h\Yb`gi Va]HYX`hc

 $\begin{tabular}{ll} $$ \hat{b} = \frac{1}{k} \hat{b} = \frac{1$

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

FYgci fWfg

DfYgWf]VYX F Ygci fWYg

Hc VY XYhYfa]bYX]b Wcbgi `HUh]cb k]h mci f gi dYfj]gcffgŁ

FYWca a YbXYX FYgci fWYg

Hc VY XYIYfa]bYX]b Wbgi `HJIJcb k]h mci f gi dYfj]gcffgl

7ci fgY 9j U`i Uh]cb UbX 8Yj Y`cda Ybh

DfYj]ci gʻghi XYbhgʻ\Uj Yʻj Uʻi YXʻh\YʻfYgYUfW\dfcYWhUgʻUbʻcddcdfhi b]hmhcʻfYWY]j Yʻa Ybhcf]b[ʻ]bʻfYgYUfW\hYV\b]ei Yg"·H\YʻfY`Uh]cbg\]dʻk]h\mci fʻgi dYfj]gcffbbʻ]gʻUʻ_YmY`Ya Ybhi]bʻh\Yʻgi WWyggʻcZmci fʻdfcYWh

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"'=hWUb`hU_Y`a Ubm Zcfa gžZfca `XY`]VYfUhY`W\YUh]b['hc`UWW]XYbhU``mWcdm]b['Zfca `U`gci fW'k]h\ci hUW_bck `YX[Ya Ybh'

 $I BGK `[fci dg'd`U[]Uf]ga `]bhc'h\Y'Zc``ck]b[`WUhY[cf]Yg.$

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

5 WUXYa]W±bZcfa Uhjcb

: cf`YggYbhJU``gh XYbh]bZcfa UhJcb`fY`UhJb['hc.

- fYei YghgʻZcfʻYl hYbg]cb/`UhYʻgi Va]gg]cbgʻ[i]XY`]bYg/
- fYj]Yk 'cZa Uf_g/
- I BGK < YU`h\ UbX GUZYmdc`]W]Yg/
- YI Ua]bUh]cb dfcWXi fYg/