



IEST5003

5XXfYgg]b['9bj]fcb a YbhU`'ggi Yg

HYfa `Cby`'#`&\$%-

GWXcc`cZ< i a Ub]h]Yg`UbX`@Ub[i U[Yg`#` I BGK `5 frg`UbX`GcWU`GWYbWg

7ci fgY`Cj Yfj]Yk

`GHUZZ7cbhUWw8YHJ`g`

`7cbj Ybcfg`

B Ua Y	9a U]`	5j U]UV]`]m	@cWU]cb	D\cbY
DUi ``6fck b	dUi ``Vfck b4 i bgk "YXi "Ui	9a U]`]g`VYgh W`bUWw`A YYHb[g VmUddc]bta Ybt`	A cfj Yb`6fck b 6i]X]b[A 6' *)	\$(%' ,) +\$

GWXcc``7cbhUWw`bZcfa U]cb

GWXcc``cZ<i a Ub]h]Yg`UbX`@Ub[i U[Yg

@cWU]cb. `GWXcc``C Z]WZ`A cfj Yb`6fck b`6i]X]b[ž@Yj Y``ž&),

CdYb]b[`<ci fg.`A cbXUm!`: f]XUmž`- Ua `!`) da

D\cbY. `ž*%&`-' ,) `%*, %

: U! . `ž*%&`-' ,) `; , +\$)

9a U]: [\U`4 i bgk "YXi "Ui](#)

7ci fgY'8YHJ`g

7fYX]hDc]bqg`*`

Gi a a UfmicZ\hY'7ci fgY

H\]g`Wci fgY`i` ghfUH`g`h`Y`bUhi` fY`cZ`UbX`bYYX`Zcf`a`i`h`!`cf`fUbg!X]gVd`d`bUfmUddfcUW`Yg`Zcf`UXXfYgg]b[
Ybj]fcba`YbH`dfcV`Ya`g`cZbUh]cbU`UbX`#cf`[`cVU`]a`dcfHUbW`";` fci`d`k`cf`_`gYa`]bUf`dfYgYbHh]cbg`k`]"`
XfUk`cb`W`ffYbhcf`fYW`bh`_YmYbj`]fcba`YbH`]ggi`Yg`UbX`k`]"`VY`gi`ddcfH`X`VmVf]YZ`YW`i`fYg`"Gca`Y`cZ`h`Y`
hcd]Mg`mci`k`]"`Wcj`Yf`UfY`Ybj`]fcba`YbH`]"`cj`YfbUbVW`Z`]bh`fbUh]cbU`Ybj`]fcba`YbH`fY`[`]a`Yg`#`W`bj`Ybh]cbg/
ZUa`]b[`UbX`XYZ]b]b[`Ybj`]fcba`YbH`]"`ggi`Yg`/di`V`]WdUfh]W]dUh]cb`UbX`gH`_Y`c`XYf`Yb[`U[`Ya`Ybh]b`XYW]g]cb`
a`U`_b[`/]bH`[`fUH`X`UbX`Zcf`k`UfX`cc_]b[`UbU`mg]g`/d`Ubb]b[`Zcf`gi`ghU]bUV`Y`XYj`Y`cda`Ybh`gV]YbW`Z`f]g`_`UbX`
_bck`YX`[`Y`/`W`ca`d`YI`gmg]H`a`g`UbX`UXUdh]`Y`a`UbU[`Ya`Ybh`/`gi`ghU]bUV`Y`bUhi`fU`fYgci`fW`a`UbU[`Ya`Ybh`/
Ybj`]fcba`YbH`]"`a`dUW`g`cZdfcXi`W]cb`UbX`W`bgi`a`dh]cb`"

7ci fgY`@YUfb]b[`Ci`hW`ca`Yg

%`8Ya`cbghfUH`Ub`UXj`UbW`X`i`bXYfghUbX]b[`cZ`h`Y`a`i`h`!`X]gVd`d`bUfmVcXmicZ`_bck`YX`[`Y`bYYXYX`Zcf`
Ybj`]fcba`YbH`]"`a`UbU[`Ya`Ybh]UbX`Udd`mX]gVd`d`bUfmUbX`fUbg!X]gVd`d`bUfm]df]bW]d`Yg`UbX`dfUW]W]g`
h`bYk`cf`W`ca`d`YI`W`U`Yb[`Yg`"
&"`8Yj`Y`cd`UbU`m]W]g`_]gZ`UXj`UbW`X`W]h]W]`hUb`%o

ghi XYbHg'UFY`YI dYWwXžcb`k YY_`mVUg]gžhc`k f]hY`U`V`c[`YbhfmfYZYW]b[`cb`h\Y]f`YUfb]b[`cZ`h\Y`k YY_`m
hcd]W`8]ghUbWw`ghi XYbHg`k]``U`gc`hU`Y`fYgdcbg]V`]hmiZcf`YUX]b[žYbWči fU[]b[`UbX`a cXYfU]b[`cb`]bY
X]gW gg]cb`cj Yf`cbY`Z ``k YY_žcb`h\Y`k YY_`mi b]hcd]WUbX#cf`WUgY`ghi Xnř`H\Ymk]``dfcXi W`Ub`cd]b]cb
YggUmUg`h\Y`Z]bU`Ugg][ba YbhZcf`h\Y`Wči fgY"

5ggYgga Ybh

: i f\Yf[i]XUbW'Uj U]UVY'j]U'hY'Wci fgY'A ccX'Y'g]H"

5ggYgga YbhHUg_g'

5ggYgga YbhHUg_	K Y][\h	8i Y'8UH'	Gh XYbh@YUfb]b[Ci hWta Yg'5ggYggYX
K YY_'m6`c[]	' \$i	Xi Y'YUW'k YY_	%z&Z ž(ž)
:]Y'X'5gg][ba Ybh	&\$i	8i Y'a]X'hYfa žYI UWhXUH'hc VY'UXj]gYX	%z&Z ž(ž)
; fci d'7 UgY'Gh Xmi	&\$i	Hck UfXg'hY'YbX'cZH'fa " 8UH'H65"	%z&Z ž(ž)
Cd]b]cb'9ggUm	' \$i	8i Y'Uh'hY'YbX'cZH'fa "'8UH' H65"	%z&Z ž(ž)

5ggYgga Ybh8YHJ]`g

5ggYgga Ybh% 'K YY_'m6`c[

GHUfhXUH'.

@Yb[h. ; YbYFU'mUfci bX" \$\$'k cfXg'Zcf'YUW'V'c["

8YHJ]`g. 'K YY_'mig\cfhk f]H'Yb'gi a a Uf]Yg'Zcf'X]ghUbW'UbX'cb!WJa di g'gh XYb'gžk]h'g\cfhcb']bY
ZYXVUW_[]j YbžZcf'%'k YY_g'r' '\$\$'k cfXg'dYf'k YY_

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

Hcd]Wg'Zcf'mci f'V'c[g'k]''VY'YghUV]g\YX'YUW'k YY_žUbX'k]''fY'UH'hc'mci f']bXYdYbXYbh'fYgYUfW"

Gi Va]gg]cb'bchYg.Gi Va]hk YY_'mj]U'mci f'A ccX'Y'g]H'

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

5ggYgga Ybh&. :]Y'X'5gg][ba Ybh

GHUfhXUH'. 'b h'Y]fgh'h'fY'k YY_g'cZH'Y'Wci fgY

@Yb[h. %\$\$\$'k cfXg

8YHJ]`g. 'Gh XYb'g'k]''VY'fYei]fY'hc'gi Va]hU%'\$\$\$'k cfX'fYdcfhVUgYX'cb'U'Z]Y'X'Ugg][bYa Ybh

Gi Va]gg]cb'bchYg.Mci f'dfcdcgU'Zcf'mci f'Z]Y'X'k cf_'k]''VY'cbY'cZmci f'V'c[g"H\Y'Z]bU'fYdcfhk]''VY
gi Va]H'X'j]U'mci f'A ccX'Y'g]H'

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

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

ቅጅfa Uከcb`UVci hfYgci fWg`k]`VY`j]U`ከY`Wci fgY`A ccX`Y`g]ከ" F YUX]b[g`k]`VY`"ghYX`UbX`a UXY Uj U]UV`Y`ከfci [\`ከY`@9; 5BHC`gmghYa "

F YWca a YbXYX`F Ygci fWg

ቅጅfa Uከcb`UVci hfYgci fWg`k]`VY`j]U`ከY`Wci fgY`A ccX`Y`g]ከ" F YUX]b[g`k]`VY`"ghYX`UbX`a UXY Uj U]UV`Y`ከfci [\`ከY`@9; 5BHC`gmghYa "Mci`k]`U`gc`VY`YI dYWYX`ከ`WcbXi`Vh]bXYdYbXYbhYgYUfW ከUከ`YUXg`mci`ከ`chYf`gdYW]U]gYX`gci fWg"

7 ci fgY`9j U`i Uከcb`UbX`8Yj Y`cda Ybh

A mፀI dYf]YbW`k]`VY`i gYX`UከከY`YbX`cZgYgg]cb`ከ`Yj U`i Uከ`ከY`Wci fgY"

: cW`g [fci dg`k]`dfcj]XY`UXX]ከcbU`ZYXVUW`ከck UfXg`ከY`a]XX`Y`cZከY`Wci fgY"

6 UgYX`cb`dUghgh XYbhYI dYf]YbW`UbX`fYgi`ከ]b[`Wci fgY`XYj Y`cda Ybhከ`ከY`ZcW`g`k]`VY`cb`UddfcUWYg ከUከZcghYf`]bXYdYbXYbhYgYUfW`UbX`k f]ከ]b[`ከUከ]g`cZU`gVX`c`Uf`m`\][\`ghUbXUfX/UbX`ci hdi hg`ከUከUfY`cZ dfUW]W`i gY`]b`Z]bX]b[`Ybj]fcb`a YbከU`gc`i ከcbg"

5 WUXYa]W<c bYghmiUbX`D`U[]Uf]ga

D`U[]Uf]ga `]g`i g]b[`h`Y`k cfXg`cf]XYUg`cZc`h`Yfg`UbX`dfYgYbh]b[`h`Ya `Ug`mci f`ck b" `h`WUb`hU`Y`a Ubm
Zcfa gž`Zca `XY`]VYfU`h`W`Y`U`h]b[`h`U`W`Y`X`Y`b`U`m`W`c`d`m]b[`Zca `U`gci f`W`k]h`ci h`U`W`b`c`k `Y`X[`Ya `Y`b`f`

I BGK `[fci dg`d`U[]Uf]ga `]b`h`Y`Zc`ck]b[`W`U`h`Y`[cf]Yg.

7 cdm]b[.`i`g]b[`h`Y`g`Ua `Y`cf`j`Y`fmg]a]U`f`k`cf`X`g`h`c`h`Y`cf][]b`U`h`I`h`cf]X`Y`U`k]h`ci h`U`W`b`c`k `Y`X[]b[`h`Y`

5 WUXYa]WbZcfa Uhcb`

: cfYggYbh]U`ghi XYbh]bZcfa Uhcb`fY`Uh]b[`hc.

- fYei Yghg`ZcfYI hYbg]cb/
- `Uhr`gi Va]gg]cbg`[i]XY`]bYg/
- fYj]Yk `cZa Uf_g/
- I B GK `<YU`h`UbX`GUZY`midc`]WYg/
- YI Ua]bUh]cb`dfcVWXi fYg/
- gdYW]U`Wc]bg]XYfUh]cb`]b`hY`Yj Ybhcz]`bYgg`cf`a]gUXj Ybh fY/
- ghi XYbhYei]hmUbX`X]gUV`]`hm/
- UbX`chYf`YggYbh]U`UWUXYa]W]bZcfa Uhcbz`gYY

[\hfdg.#k k k "Ufng"i bgk "YXi "Ui #W ffYbh\]ghi XYbh\]bZcfa Uhcb`dfc\]Wc`g`\[i \]XY`\]bYg#](#)

⇒ U[Y`7fYX]h

6UfUb[Ufcc.`GmXbYmf]i fVUb`fY!XYj Y`cda YbhW]U`Yb[Yg`i g`hc`h]b_`UVci hUXUdhj Y`UbX`dUfh]W]dUrcfm Ybj]fcba YbhU`a UbU[Ya Ybh]b`hY`ZJW`cZdfYgg]b[`Ybj]fcba YbhU`]ggi Yg`-`ck`hc`Wc]b]b`UbX`fYUh Wc]b]Ua]bUhYX`]bXi gff]U`g]Ygž`ck`hc`hU_Y`UW]ci bhczW`hi fU`Yf]fU[Y`]bW] X]b[`bX]] Ybci g`Yf]fU[Y`UbX]bXi gff]U`g]hcfnz`ck`hc`Yb[U[Y`fdi V`]W]f]b`Ybj]fcba YbhU`XYW]g]cb]a U_]b[""D`chc[fUd`VmDUi ``6fck b"

7F ⇒ CG

7F ⇒ CG`Dfcj]XYf`7cXY.`\$\$\$- ;