



HUMS1009

Gci bXg'; ccX. 'A i g]Mž'D`YUgi fY 'UbX'K Y`!VY]b[

Gi a a Yf' #'&\$&\$

7 ci fgY`Cj Yfj]Yk

`GHJZ`7 cbhJWh`8YHJ`g`

`7cbj Ybcfg`

B Ua Y	9a Uj`	5j U]UV]]m	@cWjhcb	D\cbY
9a YfmGWXi VYfh	Y"gwXi VYfh i bgk "YXi "Ui			

GWXcc`7cbhJWh`bZcfa Uhjcb

Fcca " %&Z`Yj Y`` F cVYfhK YVghYf`6i]X]b[

7ci fgY'8YHJ]`g

7fYX]hDc]bHg`*`

Gi a a UfmicZ`hY'7ci fgY

K `m]g'a i g]Wgc`Yb`entUV`Yz`UbX`jg`]hifYU`m[ccX`Zcf`i g3`H`jg`W`ei fgY`UXXfYggYg`U`fUb[Y`cZei Ygh]cbg
W`bW`fbYX`k]h`hY`d`YUgi fY`UbX`YU`h`UgdYW`g`cZa i g]W`C`hYf`ei Ygh]cbg`X]gW`ggYX`]bW`XY.`g`]h
dcgg]Y`h`U`h`a i g]W`g`]h[ccX`Zcf`mci f`VfU]b3`K `m]W`b`a i g]W`VY`i gYX`h`fYUhgca Y`]`bYggYg`UbX
fYXi W`Ubl]Ym`B`7`Ub`]hVY`VUX`Zcf`mci 3`5`fUb[Y`cZ`Uddfc`UW`Yg`UfY`W`bg]XYfYXz`Zca`a`Ugg`a`YX]U`UbX
dYfgcbU`dYfgdYW`j`Ygzh`fci [`h`d`]`cgcd`]W`]bei]fmz`UYgh`Yh]Vg`UbX`dgm`Xc`c[m`H`Y`W`ei fgY`U]a`g`h`c
W`U`Yb[Y`ghi XYbhg`UbX`Z`fb]g`h`Ya`k`]h`g`]`g`]b`W`]h]W`mYj`U`i`U]b[`j`Uf]ci`g`j`Yk`g`cb`l`ck`a`i`g]W
dfYz`fYbW`UbX`k`Y`VY]b[`dfc[fUa`g`Ya`Yf[Ygzh`UbX`dfYgYbhg`fYW`bh]h]b_]b[`cb`h`Y`h`cd]W`]`Hi`h`f]U`g`Z`W`g
cb`XYg[]b]b[`UbX`Y`U`i`U]b[`dfUW`]W`Udd`]W`h]cbg`cZa i g]W]b`YU`h`UbX`YbhYfU]ba`YbhgYh]b[g`

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

%`7`f]h]W`mYj`U`i`U`h`Uf[i`a`Ybhg`UVci`h`h`Y`UW`ei`jg]h]cb`cZa i g]WdfYz`fYbW`g`UbX`YU`h`fY`U`h`X
ci`hW`a`Yg`h`fci [`a`i`g]W]b`h`f]Y`Ybh]cb`
&`5`dd`miU`fUb[Y`cZ`gW`c`Uf`ma`Y`h`c`Xg`k`Y`b`]bj`Ygh[U]b[`a`i`g]W`UbX`h`Y`Uf`g`
` `I`bXYfU`_`Y`Z`f`h`Y`f`fYgYUfW`cb`ei`Ygh]cbg`W`bW`fbYX`k`]h`a`i`g]W`W`[`b]h]cb`UbX`k`Y`VY]b[`

HYUW`]b[`G`h`U`h`[]Yg`

H`Y`W`ei`fgY`W`bg]g`g`cZ`Y`W`i`fYg`UbX`cb`]bY`Y`Ufb]b[`UW`j`]h]Yg`@`Y`W`i`fYg`YI`dcgY`h`Y`gh`XYbh]c`U`j`Uf]Y`micZ
k`Umg`cZi`bXYfg]h]bX]b[`l`ck`UbX`k`l`mk`Y`XYj`Y`cd`a`i`g]W]`dfYz`fYbW`gzh`UbX`l`ck`h`Y`mi`W`b`W`U`b[Y`c]`Yf
h]a`Y`5`j`Uf]Y`micZ`]g`h`f]W`]`UbX`W`b`h`Y`a`d`c`f`U`f`m`h`Y`c`f]Yg`UbX`a`Y`h`c`Xg`Z`c`f`U`bgk`Y`f]b[`gi`W`h`ei`Ygh]cbg`UfY
]bj`Ygh[U`h`X`D`fYz`fYbW`Z`Y`g`]`_`Y`U`l`[`l`mid`YfgcbU`d`Y`b`c`a`Y`b`c`b`Z`c`f`a`U`b`m`d`Y`c`d`Y`
C`b`]bY`Y`Ufb]b[`UW`j`]h]Yg`UfY`XYg[]bYX`h`Y`b`W`ei`fU[Y`XYd`YI`d`c`f`U`h]cb`cZ`h`Y`g`Y`dfYz`fYbW`g`UbX`h`c
fYW`bW`Y`h`c`g`Y`k`]h`h`Y`c`f]Yg`d`fYg`Y`b`h`X`]b`Y`W`i`fYg`C`b`]bY`Y`Ufb]b[`UW`j`]h]Yg`U`gc`U`ck`g`h`XYbh]c`h`c
W`U`Yb[Y`UbX`Z`f`h`Y`f`fYU`g`cb]b[`Z`c`f`h`Y`U`W`ei`jg]h]cb`cZa i g]W]`h`U`gh`Yg`UbX`dfYz`fYbW`g`

5ggYgga Ybh

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K Y][\h	8i Y`8UHŸ	Gh XYbh@YUfb]b[Ci hWta Yg`5ggYggYX
@YUfb]b[`5Wŷj]lm%`	` \$i	Bch5dd`]WUVY	%
@YUfb]b[`5Wŷj]lm&`	` \$i	Bch5dd`]WUVY	%ž&ž
HYgh	(\$i	%(#\$\$#&\$\$&\$) . \$\$`DA	%ž&ž

5ggYgga Ybh8YHU]`g

5ggYgga Ybh% `@YUfb]b[`5Wŷj]lm%

GHUfhXUHŸ. `

8YHU]`g. `H\]g`Ugg][ba YbhWcbg]ghg`cZUWŷj]hYg`UbX`k f]hYb`k cf_`cZUddfcI]a UHŸ`m%\$\$\$`k cfXg`cb`hcd]Wg
fY`UHŸX`tc`a i g]Wžd`YUgi fY`UbX`YbhYfHU]ba Ybh`A Uf_g`k]`VY`bi a Yf]WU`žk]h`k f]hYb`ZYXVUW_`dfcj]XYX"

5ggYgga Ybh& .@YUfb]b[`5Wŷj]lm&

GHUfhXUHŸ. `

8YHU]`g. `H\]g`Ugg][ba YbhWcbg]ghg`cZUWŷj]hYg`UbX`k f]hYb`k cf_`cZUddfcI]a UHŸ`m%\$\$\$`k cfXg`cb`hcd]Wg
fY`UHŸX`tc`a i g]Wž\YU`h`UbX`k Y`VY]b[""A Uf_g`k]`VY`bi a Yf]WU`žk]h`k f]hYb`ZYXVUW_`dfcj]XYX"

5ggYgga Ybh' .`HYgh

GHUfhXUHŸ. `%(#\$\$#&\$\$&\$`\$(. \$\$`DA

8YHU]`g. `H\Y`HYghUggYggYg`YWŷi fY`WcbhYbhbcHUggYggYX`]b`hY`E i]n`H\Y`hYghk]`Wcbg]ghcZa i `hd`Y
Wc]Wŷ`UbX`g`c`fh`Ubgk Yf`]hYa g"" : YYXVUW_`k]`Wcbg]ghcZU`bi a Yf]WU`a Uf_`"

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

GYY`A ccXY`žcf`XYHU]`g"

F Ygci fWg

DfYgW]VYX`F Ygci fWg`

D`YUgY`gYY`A ccX`Y

F YWca a YbXYX`F Ygci fWg

D`YUgY`gYY`A ccX`Y

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

H\]g`]g`hY`Z]fgh]a Y`hY`Wci fgY`]g`fi bb]b["

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Hi fb]hb`Gi Va]gg]cb

≠mci`YbWci`bhYf`U`dfcV`Ya`k`Yb`U`H`Ya`dh]b[`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybh`h`fci`[`\`Hi`fb]hb`z`d`YUgY`
H`Y`d`l`cb`Y`9I`H`f`b`U`Gi`ddcfh`cb`-`,`)``%`cf`Ya`U`H`Ya`cb`YI`H`f`b`U`H`f`gi`ddcfh`4`i`bgk`"YXi`"Ui`"Gi`ddcfh`
`l`ci`fg`UfY`,`.\$\$Ua`-`%\$.\$\$da`cb`k`YY`XUmg`UbX`-`.\$\$Ua`-`).\$\$da`cb`k`YY`YbXg`f`l`*)`XUmg`U`m`Y`Uf`l`"≠mci`
UfY`i`bUV`Y`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybh`Xi`Y`hc`U`Z`U`h`k`]h`Hi`fb]hb`mci`a`Um`Udd`m`Z`f`Ub`YI`H`f`bg]cb`z`Vi`hmc`i`
a`i`gh`f`Y`h]b`mci`f`h]W`Y`h`bi`a`VY`f`Z`ca`9I`H`f`b`U`Gi`ddcfh`f`U`cb[`k`]h`Ub`m`c`h`Y`f`f`Y`j`Ub`h`X`c`W`a`Y`b`h`g`l`hc`
]b`W`i`X`Y`U`g`Y`j`]X`Y`b`W`hc`gi`ddcfh`mci`f`YI`H`f`bg]cb`Udd`]W`h]cb"≠mci`Ya`U`9I`H`f`b`U`Gi`ddcfh`mci`k`]`
Ui`h`ca`U`h]W`m`f`Y`W`j`Y`U`h]W`Y`h`bi`a`VY`f`z`Vi`h]Z`mci`H`Y`d`l`cb`Y`mci`k`]`b`Y`Y`X`hc`gd`Y`W`Z`W`m`U`g`_`Z`f`cb`Y`
Hi`fb]hb`U`gc`d`fc`j`]X`Y`g`i`d`X`U`H`g`i`cb`h`Y`j`f`g`m`g`h`Ya`g`h`U`h`g`i`cb`H`k`]h`Y`f`"

;`Yb`Y`f`U`m`z`Ugg`Y`gga`Y`bh`h`U`g`_`g`a`i`gh`V`Y`gi`Va`]h`Y`X`Y`Y`W`f`cb]W`m`j`]U`Y`]h`Y`f`Hi`fb]hb`cf`U`A`cc`X`Y`
Ugg][`ba`Y`bh`h`b`]b`g`h`U`b`W`g`k`Y`f`Y`h`l`g`]g`b`ch`id`c`g`g]V`Y`z`]h`k`]`V`Y`g`h`U`H`X`cb`mci`f`W`ci`fg`Y`g`A`cc`X`Y`g`]h`k`]h`
U`h`f`b`U`h]`Y`gi`Va`]gg]cb`X`Y`h]g`"

:`cf`]b`Z`c`fa`U`h]cb`cb`l`ck`hc`gi`Va`]h`Ugg][`ba`Y`bh`g`cb`]b`Y`j`]U`A`cc`X`Y`.\`h`td`g`#`g`h`X`Y`b`h`i`bgk`"YXi`"Ui`#`ack`!
gi`Va`]h`Ugg][`ba`Y`bh`a`cc`X`Y`"

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

D`U[]Uf]ga `]g`i`g]b[`h`Y`k`cfXg`cf`]XYUg`cZc`h`Yfg`UbX`dfYgYb]b[`h`Ya`Ug`mci`f`ck`b" `#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`d`m]b[`Zca`U`gci`f`W`k`]h`ci`h`U`W`b`ck`Y`X[`Ya`Y`b`h`

- i bXYfgHUbX'mci f'f][\hg'UbX'fYgdcbg]V]]hYg'Ug'U'gh XYbhUhl BGK
- VY'Uk UfY'cZd'U[]Uf]ga ž'Wcdmf][\hž' BGK 'Gh XYbh7cXY'cZ7cbXi WñUbX'5WwdfUV'Y'I gY'cZ
I BGK '⇒H'F Ygci fW'g'Dc`]Wñ
-

5 WUXYa]WbZcfa Uhcb`

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

- fYei Yghg`ZcfYI hYbg]cb/
- `UhY`gi Va]gg]cbg`[i]XY`]bYg/
- fYj]Yk `cZa Uf_g/
- I BGK `<YU`h`UbX`GUZY`midc`]WYg/
- YI Ua]bUh]cb`dfcVWXi fYg/
- gdYW]U`Vc]bg]XYfUh]cb`]b`hY`Yj Ybhcz]`bYgg`cf`a]gUXj Ybh fY/
- ghi XYbhYei]hmUbX`X]gUV`]`]m/
- UbX`chYfYggYbh]U`UWUXYa]W]bZcfa Uh]cbz`gYY

[\hfg.#k k k "Ufng"i bgk "YXi "Ui #W ffYbhghi XYbh\]bZcfa Uhcb`dfc\]Vc`g!\[i \]XY`\]bYg#](#)

⇒ U[Y`7 fYX]h

Gc`c`DYfZcfa UbW`A U_]b[`&\$%-

7F ⇒ CG

7F ⇒ CG`Dfcj]XYf`7cXY.`\$\$\$- ;