



HUMS1010

9I dYfjYbWjpb['h\Y'GmXbYmiC dYfU' < ci gY

HYfa 'Hk c''##'&\$&%

7ci fgY'8YHJ]`g

7fYX]hDc]bqg`*`

Gi a a UfmicZ`h`Y'7ci fgY

H\Y'GmXbYmC dYfU`<ci gY`]g'cbY'cZ`h`Y'k cF'X'g'a cghX]gh]bW]j Y'UbX']bgfUbhmfYw[b]gUV`Y`Vi]X]b[g"Mc
k]"Uj Y'gYYb]hcb'dcghWfXgž'rci f]ghVfcWwi fYgž'h`Yj]g]cb'g\ck gžZ'a gžgci j Yb]fgžUfhk cf_g'UbX'h`YfY
]g`Yj Yb'U`_]h`h`U`h`U`ck g'mci `hc`Vi]X'mci f]j Yfmick b]j Yfg]cb'cZ]hici hcZ@9; C"K \Yh`Yf'h`]g`]g'mci f'Z]fgh
h]a Y']b'GmXbYmcf'mci `Uj Y`j] YX'\YfY'U`mci f`]Zž'h`]g`Wci fgY []j Yg'mci `h`Y'cddcfi b]hmihc`cc`U`h`h`g
]Wcb]Wwi]X]b[`Zfca `U`fUb[Y'cZx]ZyfybhdYfgdYw]j Yg']b'cfXYf'hc`i bXYfgfUbx'UbX'UddfYw]Uhy`]h`UbYk "
H\fc i [\ `U`gYf]Yg'cZgY`ZdUwX'k U`_]b[`rci fgž'mci `k]"gYY'UbX'Yi dYf]YbWw`h`Y'c dYfU`<ci gY`h`fc i [\
a i `h`d`Y`"YbgYg"i` b`fYgdcbgYž'mci `k]"XYj Y'cd`W]h]WU`fYZYW]j Y'fYgdcbgYg'hc`h`YgY'Yi dYf]YbWw`g'UbXž`]b

5ggYgga Ybh

Mci`k`j`~\Uj`Y`U`V`W`X`g`g`h`c`U`d`f`j`U`H`V`c`[`h`U`h`m`c`i`W`U`b`i`g`Y`U`g`U`Y`U`f`b`j`b`[`e`i`f`b`U`M`c`i`k`j`~f`Y`W`j`Y`Z`c`f`a`U`h`j`Y`Z`Y`X`V`U`W`_`c`b`U`h`Y`U`g`h`c`b`Y`d`f`j`U`H`V`Y`U`f`b`j`b`[`e`i`f`b`U`Y`b`f`m`h`c`g`i`d`d`c`f`h`h`Y`X`Y`j`Y`c`d`a`Y`b`h`c`Z`m`c`i`f`f`Y`Z`Y`W`j`Y`k`f`j`h`b`[`g`_`g`"

5ggYgga YbhHUg_g

5ggYgga YbhHUg_	K Y][\h	8i Y`8UH`	Gh XYbh@YUfb]b[Ci hWta Yg`5ggYggYX
K f]hYb`a`YH!fYZYW]cb`	(\$i	A cb`5i [`&` `&\$&%`-`.\$\$. \$\$; A HZ%\$\$`fBi`ghfU]Ub 9UghYfb`GHbXUF`H]a`YŁ	&
DUHk`k`cf_`fYZYW]cb`	* \$i	A cb`GYd`%` `&\$&%`-`.\$\$. \$\$; A HZ%\$\$`fBi`ghfU]Ub 9UghYfb`GHbXUF`H]a`YŁ	%ž`&ž`

5ggYgga Ybh8YHJ]`g

5ggYgga Ybh%`K`f]hYb`a`YH!fYZYW]cb`

GHfH`XUH`. A cb`5i [`%+`&\$&\$`\$`-`.\$\$. \$\$`; A HZ%\$\$`fBi`ghfU]Ub`9UghYfb`GHbXUF`H]a`YŁ

@Yb[`h`.)`\$\$!,`\$\$`k`cfXg`

8YHJ]`g.

)`\$\$!,`\$\$`k`cfXgž`Xi`Y`cb`XUm`&`]b`]bhYbg]j`Y`a`cXY`"

5`a`Uf`ž`k`f]hYb`Z`Y`X`V`U`W`_`U`b`X`U`f`i`V`f`j`W`k`j`~`V`Y`d`f`c`j`j`Y`X`j`b`~`X`U`m`g`"

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

A`c`f`Y`]b`Z`c`f`a`U`h`c`b`U`j`U`j`U`V`Y`c`b`h`Y`A`c`c`X`Y`d`U`[`Y`"

Hi`fb`]h]b`g`Y`h]b`[`. H\]g`Ugg][`ba`Ybh]g`gi`Va`]h]X`h`f`c`i`[`\`Hi`fb`]h]b`U`b`X`g`h`X`Y`b`g`X`c`b`c`h`g`Y`Y`Hi`fb`]h]b`g]a`]Uf]mifYdcftrg`"

5ggYgga Ybh&`DUHk`k`cf_`fYZYW]cb`

GHfH`XUH`. A cb`5i [`%*`&\$&%`\$`-`.\$\$. \$\$`; A HZ%\$\$`fBi`ghfU]Ub`9UghYfb`GHbXUF`H]a`YŁ

@Yb[`h`. `&\$\$\$`k`cfXg`

8YHJ]`g.

&\$\$k`cfX`V]h]W`fYZYW]cbž`Xi`Y`cb`h`Y`A`cb`X`U`m`U`Z`Y`f`h`Y`Z`b`U`X`U`m`]b`]bhYbg]j`Y`a`cXY`"

5 'a Uf_žk f]hYb'ZYXVUW_ 'UbX'U'fi Vf]Wk]''VY'dfcj]XYX']b'fk c'k YY_g''

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

A cfY]bZcfa Uh]cb'Uj U]UVY'cb'hY'A ccXY'dU[Y''

Hi fb]h]b'gYh]b[. h\]g'Ugg][ba Ybh]g'gi Va]hYX'h'fci [\ 'Hi fb]h]b'UbX'ghi XYbh]Xc'bcgYY'Hi fb]h]b'g]a]Uf]h]mifYdcfrg''

5 hYbXUbW F Yei]fYa Ybhg

Gh XYbhg UfY gfhcb [mYbWci fU[YX hc UhmYbX U WUggYg UbX fYj]Yk YWfi fY fYWcfX]b[g"

7 ci fgY GWXYXi Y

[J Yk WUgg ha YhUVY](#)

H]a YhUV Y

8UhY	HmdY	7cbhYbh
K YY_% %* 5i [i gh! &\$ 5i [i gh	@YWfi fY	H\ fYY \ci f ZJW!hc!ZJW WUgg CF gY ZdUWX YUfb]b[UWhj]m
	F YUX]b[6Y[]b fYUX]b[fYei]fYX hYI hg"
	<ca Yk cf_	

@YWfi fY

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

H\YfY`UfY`fk`c`Vcc_g`h`UhUfY`fYei`]fYX`fYUX]b[`Zc`h`g`Wci`fgY`"Mci`UfY`fYei`]fYX`hc`di`fWUgY`h`YgY`Vcc_g`Y]h`Yf`]b`\UfX`Wtdmicf`Ug`YVcc_g"

D]hž<Y`Yb`f&\$%`L`H\Y`<ci`gYž5`Yb`UbX`l`bk`]b

Gi Va]gg]cb 'cZ5ggYgga YbhiHUg_g

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

Ʒmci 'YbWci bHYf'U'dfcV'Ya 'k \Yb'UH'Ya dh]b['hc'gi Va]hmc i f'Ugg][ba YbhiH'fci [\ 'Hi fb]h]bž'd'YUgY
HY'Yd\cbY'9I HYfbU'Gi ddcfhcb'-',) "' ' ' %cf'Ya U]'H'Ya 'cb'YI HYfbU'HY'f'gi ddcfh4 i bgk "YXi "Ui "'Gi ddcfh
\ci fg'UfY', .\$\$Ua '—%\$.\$\$da 'cb'k YY_XUmg'UbX'-. \$\$Ua '—) .\$\$da 'cb'k YY_YbXg'fI *) 'XUmg'U'm'YUfI" Ʒmci
UfY'i bUV'Y'hc'gi Va]hmc i f'Ugg][ba YbhiXi Y'hc'U'Zi 'hk]H'Hi fb]h]b'mci 'a UmUdd'm'Zc'f'Ub'YI HYbg]cbž'Vi hmc i
a i ghfYHU]b'mci f'h]W_Yhbi a VYf'Z'ca '9I HYfbU'Gi ddcfhfU'cb['k]H'UbmcH'Yf'fY'Yj UbhXcW a Yb'f'g'hc
]bWi XY'Ug'Yj]XYbVW'hc'gi ddcfhmc i f'YI HYbg]cb'Udd']W]h]cb" Ʒmci 'Ya U]'9I HYfbU'Gi ddcfhmc i 'k]
Ui 'ca UH]W]m'fYW]j Y'U'h]W_Yhbi a VYfž'Vi h]Zmci 'HY'Yd\cbY'mci 'k]'b'Y'X'hc'gd'Y'W]W]m'Ug_'Zc'f'cbY"
Hi fb]h]b'U'gc'dfcj]XYg'i dXUH'g'cb'H'Y]f'gm'g'Ya 'g'H'U'g'cb'Hk]H'Y'f"

; YbYfU'mž'UggYgga YbhiHUg_g'a i ghVY'gi Va]H'Y'X'Y'Y'W'f'cb]W]m'j]U'Y]H'Y'f'Hi fb]h]b'cf'U'A ccX'Y
Ugg][ba YbH' 'b]bg'f'U'b'V'W'g'k \Y'f'Y'h'g]g'bc'h'd'c'g'g]V'Y'ž'hk]'V'Y'g'h'U'Y'X'cb'mci f'W'ci fgY'g'A ccX'Y'g]H'k]H
U'HY'fb'U'h] Y'gi Va]gg]cb'XYHU]g"

: cf]bZ'fa UH]cb'cb'\ck 'hc'gi Va]h]Ugg][ba Yb'f'g'cb]b'Y'j]U'A ccX'Y. \h'hd'g. #gh XYb'hi bgk "YXi "Ui #ck!
gi Va]h]Ugg][ba Yb'f'a ccX'Y

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

D`U[]Uf]ga]g`i]b[`hY`k cfXg`cf]XYUg`cZc`hYfg`UbX`dFYgYbh]b[`hYa`Ug`mci`f`ck`b`" #WU`b`hU`_Y`a`Ubm`Z`fa`g`z`Z`ca`XY`]VYfUHY`WX`YU]b[`hc`UW]XYbhU`m`W`cdm]b[`Z`ca`U`gci`fW`k`]h`ci`hUW`_bck`YX[`Ya`Ybh`

I BGK ` [fci dg`d`U[]Uf]ga]bhc`hY`Zc`ck]b[`WU]Y[cf]Yg.

7 cdm]b[.`i`g]b[`hY`gUa`Y`cf`j`Yfmg]a`]Uf`k`cfXg`hc`hY`cf][]bU`hY`hcf`]XYU`k`]h`ci`hUW`_bck`YX[]b[`hY`gci`fW`cf`i`g]b[`ei`c`hU]cb`a`Uf`_g`"H`]g`U`gc`Udd`Y]g`hc`]a`U[`Yg`z`Ufh`UbX`XYg][`b`dfc`YWg`z`Ug`k`Y`U`g`dFYgYbhU]cbg`k`YfY`gca`YcbY`dFYgYbh]`Ubch`Yf`g`]XYUg`cf`k`cfXg`k`]h`ci`hWYX]h`

#Uddfcdf]UHY`dUfUd`fUg]b[.`7`U]b[]b[`U`Zk`k`cfXg`UbX`d`fUgYg`k`Y`a`cghm`fY]b]b[`hY`cf][]bU`ghf`W`fY`UbX`#`f`dfc[`fYgg]cb`cZ]XYUg`cZ`hY`cf][]bU`z`UbX`]bZ`fa`U]cb`k`]h`ci`hUW`_bck`YX[`Ya`Ybh`H`]g`U`gc`Udd`Y]g`]b`dFYgYbhU]cbg`k`YfY`gca`YcbY`dUfUd`fUgYg`Ubch`Yf`g`]XYUg`cf`k`cfXg`k`]h`ci`hWYX]h`UbX`hc`d]YW]b[`hc[`Y`h`Y`f`ei`c`h`g`UbX`dUfUd`fUgYg]bhc`U`bYk`k`c`Y`z`k`]h`ci`hUddfcdf]UHY`fY`ZfYbW]b["

7 c`i`g]cb.`k`cf_]b[`k`]h`c`hYfg`Vi`hdUgg]b[`cZ`hY`k`cf_]`Ug`U`dYfgcb`g`]bX]j`]Xi`U`k`cf_]`7`c`i`g]cb`U`gc`]bW`i`XYg`dfcj`]X]b[`mci`f`k`cf_]`hc`Ubch`Yf`g`h`XYbhVY`Z`fY`hY`Xi`Y`XU]Y`z`cf`Z`f`hY`di`fdcgY`cZ`hY`a`d`U[]Uf]g]b[`Uh`Ubmi]a`Y`z`dUm]b[`Ubch`Yf`dYfgcb`hc`dYfZ`fa`Ub`UWXYa`]W]Ug`_`z`gh`U`]b[`cf`UW`ei`]f]b[`Ubch`Yf`dYfgcb`g`UWXYa`]Wk`cf_]`UbX`W`cdm]b[`]h`c`Z`Y]b[`hc`W`ca`d`Y`h`Ubch`Yf`dYfgcb`g`k`cf_]`cf`gY`_]b[`dUma`Ybh`Z`f`W`ca`d`Y]b[`UWXYa`]Wk`cf_]`

#Uddfcdf]UHY`W]U]cb.`7`]h]b[`gci`fW`g`k`]W]`Uj`Y`bchVYYb`fYUX`z`k`]h`ci`hUW`_bck`YX[]b[`hY`gY`W`b`XUfm`gci`fW`Z`ca`k`]W]`_bck`YX[`Y`cZ`hY`a`U`g`VYYb`c`hU]bYX`

8 i`d`]WU]cb`f]gY`Z`d`U[]Uf]ga`E`gi`Va`]h]b[`mci`f`ck`b`k`cf_]`b`k`c`Y`cf`]b`dUf]z`k`YfY`]h`Ug`dFY]`ci`g`m`VYYb`dFYdUfYX`cf`gi`Va`]hYX`Z`f`Ubch`Yf`UggYgga`Ybhcf`W`ei`fgY`Uhi`BGK`cf`Ubch`Yf`i`b]j`Yfg]h`

7 cffYW]fY`ZfYbW]b[`dfUW]W]g.

- DUfUd`fUg]b[`zgi`a`a`Uf]g]b[`zYggUm`k`f]h]b[`UbX`h]a`Y`a`UbU[`Ya`Ybh`
- 5ddfcdf]UHY`i`gY`cZ`UbX`U]h]f]Vi`h]cb`Z`f`U`fU]b[`Y`cZ`a`U]h]f]U`g`]bW`i`X]b[`hY`h]z`]a`U[`Yg`z`Z`fa`i`UY`UbX`W`cb`W`d]g`"

#X]j`]Xi`U`Ugg]ghU]bW`]g`Uj`U]UV`Y`cb`fYe`i`Ygh`Z`ca`H`Y`@YUfb]b[`7`YbhY`f`h`hd`#`k`k`"Wi`bgk`"YXi`"Ui`#`G`h`XYbh]`UfY`U`gc`fYa`]bXYX`h`Uh`W]fY`Z`h]a`Y`a`UbU[`Ya`Ybh]g`Ub`]a`dcffU]bhdUfhcZ`gh`Xm`UbX`cbY`cZ`hY`]XYbh]Z`YX`W]i`gYg`cZ`d`U[]Uf]ga`]g`d`cc`f`h]a`Y`a`UbU[`Ya`Ybh`G`h`XYbh]g`g`l`ci`X`U`ck`gi`Z`W]Y`bh]h]a`Y`Z`f`fYgYUfW`z`X`fU]Z]b[`UbX`d`fcdYf`fY`ZfYbW]b[`cZ`gci`fW`g`]b`dFYdUf]b[`U`UggYgga`Ybh]h]a`g`

I BGK `@]VfUfmU`gc`U`g`hY`9`@G9`hc`Uj`U]UV`Y`hc`Ugg]ghmci`k`]h`mci`f`gh`Xm`Uhi`BGK`"9`@G9`]g`XYg][`bYX`hc`]bhc`Xi`W`bYk`gh`XYbh]hc`gh`Xm]b[`Uhi`BGK`Vi`h]hW]b`U`gc`VY`U`[`fYUhfY`ZfYg`Yf`Xi`f]b[`mci`f`

- i bXYfghUbx'mci f'f][\hg'UbX'fYgdcbg]V]h]Yg'Ug'U'gh XYbhUhl BGK
- VY'Uk UfY'cZd'U[]Uf]ga ž'Wcdmf][\hž' BGK 'Gh XYbh7cXY'cZ7cbXi W'Ubx'5Ww'dhUV'Y'I gY'cZ I BGK '⇒H'F Ygci fW'g'Dc`]Wm
- VY'Uk UfY'cZh'Y'ghUbxUfXg'cZVY\Uj]ci f'YI dYW'X'cZYj Yfmcby'j]b'h'Y'I BGK 'Wca a i b]m
- `cWJh'gYfj]Wg'UbX'j]bZcfa Uh]cb'UVci hl 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 bXYfghUbx]b['cZU`h'Y fY'UH'X'UgdYW'g'cZ9@G9'k]`Y'd'mci 'a U_Y'h'Y'a cghcZmci f'gh X]Yg'Uhl BGK ""

[\hhd.##ji V'YWf i \]XYg" \]VfUfm'i bgk "YXi "Ui #' \]gY#JVci h' \]gY](#)

5 WUXYa]WbZcfa Uh]cb

: cfYggYbh]U`gh XYbh]bZcfa Uh]cb fY`Uh]b[`tc.

- fYei Yghg`Zcf`YI H`bg]cb/
- `UhY`gi Va]gg]cbg`[i]XY`]bYg/
- fYj]Yk `cZa Uf_g/
- I BGK `<YU`h`UbX`GUZY`mdc`]WYg/
- YI Ua]bUh]cb`dfcW`Xi fYg/
- gdYW]U`W`bg]XYfUh]cb`]b`hY`Yj Ybhcz]`bYgg`cf`a]gUXj Ybh fY/
- gh XYbhYei]miUbX`X]gUV`]m/
- UbX`c`hYf`YggYbh]U`UWUXYa]W]bZcfa Uh]cbz`gYY

[\hfdg.##k k k "Ufng"i bgk "YXi "Ui #W ffYbh\]gh XYbh\]UWUXYa \]W\]bZcfa Uh\]cb#dfchW`g!\[i \]XY`\]bYg#](#)

⇒ a U[Y`7 fYX]h

6m5fbY`A U[bi ggYb`!`hfdg.##k k k "]bZcfa Uh]cb"X_#_i `h f#Uba Y`XY`gY#&\$%- #&# mcb!dUYbhcfXYbh][h[Yb]ž
77`6MG5`("\$ž`hfdg.##W`a a cbg"k]_a YX]U`cf[# #bXYI "d\d3W f]X1,) *' &((

7F ⇒ CG

7F ⇒ CG`Dfcj]XYf`7cXY. '\$\$- , ;

5W_bck`YX[Ya Ybhcz`7ci bhfm

K Y`UW_bck`YX[Y`hY`6YXY[U`dYcd`Y`k`c`UfY`hY`fUX]h]cbU`W`g`hX]Ubg`cZ`hY`UbXg`cb`k` \]W`I BGK
? Ybg]b[hcb`W]a di g`]g`cW]hYX"