



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`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`ZdUW`X'k U`_]b[`rci fgž'mci `k]"gYY'UbX'YI dYf]YbW`h`Y'c dYfU`<ci gY`h`fc i [\
a i `hd`Y`"YbgYg"i` b`fYgdcbgYž'mci `k]"XYj Y`cd`W]h`W]i`fYZYW]j Y`fYgdcbgYg'hc`h`YgY`YI dYf]YbW`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`GHUbXUFX`H]a`YŁ	&
DUHk`k`cf_`fYZYW]cb`	* \$i	A cb`GYd`%` `&\$&%`-`.\$\$. \$\$` ; A HZ`%\$\$\$`fBi`ghfU`]Ub` 9UghYfb`GHUbXUFX`H]a`YŁ	%ž`&ž`

5ggYgga Ybh8YHJ]`g

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

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

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

8YHJ]`g.

)`\$\$!,`\$\$`k`cfXgž`Xi`Y`cb`XUm`&`]b`]bhYbgj`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`]`X`Y`X`]`b`~`X`U`m`g`"

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

A`cfY`]b`Z`c`f`a`U`h`c`b`U`j`U`]`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`U`g`g`[`ba`Y`b`h`g`g`i`Va`]`h`Y`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`]`U`f`]m`i`f`Y`d`c`f`r`g`"

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

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

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

8YHJ]`g.

&\$\$\$`k`cfX`W`]h`W`~`f`Y`Z`Y`W`j`c`b`ž`Xi`Y`cb`h`Y`A`c`b`X`U`m`U`Z`Y`f`h`Y`Z`b`U`X`U`m`]b`]bhYbgj`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' bchgYY'Hi fb]h]b'g]a]Uf]h]mifYdcfrg''

5 hYbXUbW`F Yei]fYa Ybhg

Gh XYbhg`UFY`ghfcb[`mYbWci fU[YX`hc`UhhYbX`U`WUggYg`UbX`fYj]Yk ``YWhi fY`fYWc`fX]b[g"

7 ci fgY`GWXYXi `Y

[J\]Yk`WUgg`hja`YhUV`Y](#)

H]a`YhUV`Y`

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

@YWhi 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

≠mci`YbWci bHYf`U`dfcV`Ya`k` \Yb`UH`Ya` dh]b[`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybhi`h`fci`[`\`Hi`fb]h]b`z`d`Y`Ug`Y`
HY`Yd`l`cb`Y`9I`HY`fb`U`Gi`ddc`fh`cb`-`,`,)``'``'``%cf`Ya`Uj`h`Ya`i`cb`YI`HY`fb`U`HY`hgi`ddc`fh`4`i`bgk`"YXi`"Ui`""Gi`ddc`fh`
l`ci`fg`UfY`,`.\$\$Ua`-`-%\$.\$\$da`i`cb`k`YY`XUmg`U`bX`-`.\$\$Ua`-`).\$\$da`i`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`Ybhi`Xi`Y`hc`U`Z`Ji`h`k`]h`Hi`fb]h]b`mci`i`a`Um`Udd`m`Z`f`U`b`YI`HY`bg]cb`z`Vi`hmc`i`
a`i`gh`f`Y`h]b`mci`f`h]W`Y`hbi`a`VY`f`Z`ca`9I`HY`fb`U`Gi`ddc`fh`f`U`cb[`k`]h`U`b`m`c`h`Y`f`f`Y`Yj`U`b`h`X`c`W`a`Y`b`h`g`k`h`c`
]b`Wi`XY`U`g`Y`j`]X`Y`b`W`Y`hc`gi`ddc`fh`mci`f`YI`HY`bg]cb`Udd`]W`h]cb`"≠mci`Ya`Uj`9I`HY`fb`U`Gi`ddc`fh`mci`k`]`
Ui`h`ca`U`h]W`U`m`f`Y`W`]j`Y`U`h]W`Y`hbi`a`VY`f`z`Vi`h]Z`mci`HY`Yd`l`cb`Y`mci`k`]`b`Y`Y`X`hc`gd`Y`W`Z]W`U`m`Ug`_`Z`f`c`b`Y`"
Hi`fb]h]b`U`gc`d`fc`j`]X`Y`g`i`d`X`U`h`Y`g`c`b`h`Y`]f`g`m`g`h`Y`a`i`g`h`U`h`g`c`b`H`k`]h`Y`f`"

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

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

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

D`U[]Uf]ga]g'i]b['hY'k cfXg'cf]XYUg'cZcH.Yfg'UbX'dfYgYbh]b['hYa 'Ug'mci f'ck b" #WUb'fU_Y'a Ubm
Z'fa gZ'Zca 'XY'VYfUHY'WX.YU]b['hc'UW]XYbhU'mWcdm]b['Zca 'U'gci fW'k]h'ci hUW_bck 'YX[Ya Ybh'

I BGK '[fci dg'd'U[]Uf]ga]bhc'hY'Z'ck]b['WU] [cf]Yg.

7 cdm]b[.i]g]b['hY'gUa Y'cf'j Yfmg]a]Uf'k cfXg'hc'hY'cf][]bU'hYi hcf'XYU'k]h'ci hUW_bck 'YX[]b['hY'
gci fW'cf'i]g]b['ei chU]cb'a Uf_g" 'H\]g'U'gc'Udd'Yg'hc]a U[YgZ'UfhUbX'XYg][b'dfc YWgZ'Ug'k Y''Ug
dfYgYbhU]cbg'k \YfY'gca YcbY'dfYgYbhg'Ubch.Yf'g]XYUg'cf'k cfXg'k]h'ci hWYX]h'

#Uddfcdf]UHY'dUfUd\UfUg]b[.7\Ub[]b['U'Zk'k cfXg'UbX'd\UfUg'k \]Y'a cghmfYU]b]b['hY'cf][]bU'
ghf' W' fY'UbX#f'dfc[fYgg]cb'cZ]XYUg'cZcH.Y'cf][]bU'z'UbX']bZ'fa U]cb'k]h'ci hUW_bck 'YX[Ya Ybh'H\]g'U'gc
Udd'Yg'g]b'dfYgYbhU]cbg'k \YfY'gca YcbY'dUfUd\UfUg'g'Ubch.Yf'g]XYUg'cf'k cfXg'k]h'ci hWYX]h'UbX'hc
d]YW]b['hc[Y'hYf'ei chYg'UbX'dUfUd\UfUg'g]bhc'U'bYk'k \c'Yz'k]h'ci hUddfcdf]UHY'fYZYfYbW]b["

7 c''i]g]cb.'k cf_]b['k]h'c'hYfg'Vi hdUgg]b['cZcH.Y'k cf_'Ug'U'dYfgcb'g']bX]j]Xi U'k cf_"7 c''i]g]cb'U'gc
]bWi XYg'dfcj]X]b['mci f'k cf_'hc'Ubch.Yf'g]h'XYbhVYz'fY'hY'Xi Y'XUHY'z'cf'Z'f'hY'di fdcgY'cZcH.Ya
d'U[]Uf]g]b['UhUbmi]a Yz'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'Wcdm]b[]h'c'Z'Z]f]b['hc'W'ca d'YHY'Ubch.Yf'dYfgcb'g'k cf_'cf'gYY_]b[
dUma YbhZ'f'W'ca d'Y]b['UWXYa]Wk cf_"

#Uddfcdf]UHY'W]U]cb.'7]h]b['gci fW'g'k \]W\Uj Y'bhVYYb'fYUXz'k]h'ci hUW_bck 'YX[]b['hY''gYW'cbXUfm'
gci fW'Z'ca 'k \]W'_bck 'YX[Y'cZcH.Ya '\Ug'VYYb'c'fU]bYX"

8 i d']W]cb'f'fY'Z'd'U[]Uf]ga 'E'gi Va]h]b['mci f'ck b'k cf_z']b'k \c'Y'cf']b'dUf'z'k \YfY'j'h\Ug'dfYj]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'fYZYfYbW]b['dfUW]W]g.

- DUfUd\UfUg]b[žgi a a Uf]g]b[žYggUmk f]h]b['UbX'h]a Y'a UbU[Ya Ybh
- 5ddfcdf]UHY'i gY'cZUbX'Uhf]vi h]cb'Z'f'U'fU]b[Y'cZa UHYf]U'g']bWi X]b['hYi hz']a U[YgZ'Z'fa i 'UY'UbX
W'cbW'dhg"

#X]j]Xi U'Ugg]ghU]bW']g'Uj U]UV'Y'cb'fYei YghZ'ca 'H\Y'@YUfb]b['7YbhY'f'f'hd.#k k k "Wi bgk "YXi "Ui #"
Gh XYbhg'UfY'U'gc'fYa]bXYX'hUhW]fYz' 'h]a Y'a UbU[Ya Ybh]g'Ub]a dcfU]bhdUfhcZgh XmiUbX'cbY'cZcH.Y
]XYbh]ZYX'W]i gYg'cZd'U[]Uf]ga]g'dccf'h]a Y'a UbU[Ya Ybh'Gh XYbhg'g'lc'i 'X'U'ck'gi Z]W]Ybh]h]a Y'Z'f
fYgYUfW'z'XfU]Z]b['UbX'dfcdYf'fYZYfYbW]b['cZgci fW'g']b'dfYdUf]b['U''UggYgga Ybh]h]a g"

I BGK '@]VfUfmU'gc'\Ug'hY'9@G9'hc''Uj U]UV'Y'hc'Ugg]ghmci 'k]h'mci f'gh XmiUhi BGK "'9@G9']g
XYg][bYX'hc]bhc'Xi W'bYk'gh XYbhg'hc'gh X]b['Uhi BGK 'Vi h]hW]b'U'gc'VY'U'[fYUhfYZYg\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'jb'h'Y'I BGK 'Wca a i b]m
- `cWJh'gYfj]Wg'UbX'jbZcfa 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`7fYX]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`ca 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"