



# 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]ghVfcW`i 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 \Y`h`Yf'h`h`g ]g'mci f`Z]fgh  
h`a Y`]b'GmXbYmcf'mci `Uj Y`]j YX`\YfY'U`mci f`]Z`ž'h`g`W`i fgY [ ]j Yg'mci `h`Y'cddcfi b]hmihc`cc\_`U`h`h`g  
]W`b]W`i ]X]b[ `Z`ca `U`fU`b[ Y`cZ`X]Z`Y`f`Y`b`h`d`Y`f`g`d`Y`W`j Yg`]b'cfXYf'hc`i bXYfgfU`b`X`Ub`X`U`dd`f`Y`W`j`U`h`Y`]h`Ub`Y`k`"  
H\fc i [ \ `U`g`Y`f]Y`g`c`Z`g`Y`Z`d`U`W`X`k`U`\_]b[ `h`ci fgž'mci `k ]"gYY'UbX`YI dYf]YbW`h`Y`C`dYfU`<ci gY`h`fci [ \  
a i `h`d`Y`"Y`bg`Y`g`"i`b`fYgdcbgYž'mci `k ]"XYj Y`cd`W`]h`W`i`fYZYW]j Y`fYgdcbgYg`hc`h`Y`g`Y`YI dYf]YbW`g`U`b`X`ž`]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]`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`c`f`Y`]`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`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`

GHfH`XUH`. A cb`5i [ `%\*`&\$&%`\$`-`.\$\$. \$\$`; A HZ%\$\$`fBi`ghfU]Ub`9UghYfb`GHbXUF`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`]bhYbg]`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 gfc b[ 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 YhUVY

8UhY	HmdY	7cbhYbh
K YY_% %* 5i [i gh! &\$ 5i [i gh	@YWfi fY	H\ fYY \ci f ZJW! hc! ZJW WUgg C F gY ZdUWX YUfb]b[ UWfj ]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[ `Zcf`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'ZU'ihk ]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'jW]h]cb" Ʒmci 'Ya U]'9I HYfbU'Gi ddcfhmc i 'k ]  
Ui 'ca UH]WU'm'fYW]j Y'U'h]W\_Yhbi a VYfž'Vi h]Zmci 'HY'Yd\cbY'mci 'k ]'b'Y'YX'hc'gd'Y'W]WU'm'Ug\_'Zc'f'cbY"  
Hi fb]h]b'U'gc'dfcj ]XYg'i dXUH'g'cb'H'Y]f'gm'g'Ya 'g'hU'g'cb'Hk ]H'Yf"

; YbYfU'mž'UggYgga YbhiHUg\_g'a i ghVY'gi Va ]H'Y'X'Y'Y'W'f'cb]WU'mj ]U'Y]H'Y'f'Hi fb]h]b'cf'U'A ccX'Y  
Ugg][ ba YbH' 'b]bg]H'UbVW'g'k \YfY'H'g ]g'bc]hd'cgg]V'Yž]hk ]'VY'g'H'Y'X'cb'mci f'Wci fgY'g'A ccX'Y'g]H'k ]H  
U'HY'fbUH] Y'gi Va ]gg]cb'XYHU]g"

: cf]bZ'fa UH]cb'cb'\ck 'hc'gi Va ]hUgg][ ba Yb'g'cb]bY'j ]U'A ccX'Y. \H'hdg.#gh XYb'hi bgk "YXi "Ui #ck!  
gi Va ]hUgg][ ba Yb'ha 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`" #WUb`hU`Y`a`Ubm`Z`fa`g`z`Z`ca`XY`]VYfUHY`WX`YU]b[ `hc`UW]XYbhU`mW`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`Ug`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`Z`fY`bW]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`z`Z]f]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`U]j`Y`bchVYYb`fYUX`z`k`]h`ci`hUW`bck`YX[ ]b[ `hY`gYW`bXUfm`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`Z`fY`bW]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`cbW`d]g`

#X]j`]Xi`U`Ugg]ghU]bW`]g`U]U]UV`Y`cb`fYei`YghZ`ca`H`Y`@YUfb]b[ `7`YbhY`f`h`hd.`#`k`k`"Wi`bgk`"YXi`"Ui`#`G`h`XYbh]U`fY`U`gc`fYa`]bXYX`h`Uh`W]fY`Z`h]a`Y`a`UbU[ `Ya`Ybh]g`Ub`]a`dcffU]bhdUfhcZ`gh`XmiUbX`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]Ybh]h]a`Y`Z`f`fYgYUfW`z`X`fU]Z]b[ `UbX`d`fcdYf`fY`Z`fY`bW]b[ `cZ`gci`fW`g`]b`dFYdUf]b[ `U`UggYgga`Ybh]hYa`g`

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