



MUSC3702

DYfZcfa UbWV '@JVc fUhc fm*

GYa YghYf'Hk c''##'&\$%

7 ci fgY`Cj Yfj]Yk

`GHUZZ7cbhUWh8YHJ`g`

`7cbj Ybcfg`

B Ua Y	9a Uj`	5j Uj`UVj]m	@cWjhcb	D\cbY
>c\b`BUd]Yf	^bUd]Yf4 i bgk "YXi "Ui			

5 WUXYa JWbZcfa Uhcb`

: cfYggYbhU`ghi XYbh]bZcfa Uhcb`fY`Uh]b[`hc. fYei Yghg`Zcf`YI hYbg]cb/fYj]Yk `cZa Uf_g/cVW dUh]cbU``YU`h
UbX`gUZ`m/YI Ua]bUh]cb`dfcW`Xi fYg/gdYW]U`Wcbg]XYfUh]cb`]b`hY`Yj Ybhcz]`bYgg`cf`a]gUXj Ybh fY/
ghi XYbhYeI]mUbX`X]gUV]`]m`UbX`ch`Yf`YggYbh]U``UWUXYa]W]bZcfa Uhcbž
gYY`[\frdg.##k k "Ufrg"i bgk "YXi "Ui #W ffYbh\]ghi XYbhg#UWUXYa \]W\]bZcfa Uhcb#dfc`hcWc`gl`i \]XY`\]bYg#](#)

7ci fgY'8YHJ]`g

7fYX]hDc]bhtg`*`

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

Gi VYWh5fYU.?' ge[U

è'h\g'Wèi fgY'mci `k]`XYj Y'cd'Wè`UVcfUhj Y'UbX'W]h]W`g_]`g'Zcf'bYVWggUfmZcf]bXYdYbXYbh`YUfb]b[`UbX
Zcf]bhYfUW]cb`VYhk YYb'a i g]W]Ubg'cZX]ZYfYbhgdYW]U`gU]cbg UbX`]bhYfYgth!`YggYbhU`g_]`g'Zcf'h\Y
WèbhYa dcfUfma i g]W]Ub"è'h\g'Wèi fgY'mci `k]`Yb[U[Y`]b`]b]WUgg'UW]j]h]Yg'UbX[i]XYX'dYfZcfa UbVW
XYj Y`cda YbhZ'UbX'dUfh]W]dU]h`]b`U'l b]j Yfg]mfi b'dYfZcfa UbW`[fci d"

5h\h\Y'WèbWi g]cb'cZ\h]g'Wèi fgY'h\Y'gh XYbhk]`VY'UV'Y'hc

%` 8Ya cbghfU]Y`UXj UbWYX'a i g]W]Wè`UVcfU]cb'g_]`g'h\fc i [\`dfYdUfU]cb`UbX'dfYgYbhU]cb'cZU
dYfZcfa UbW`j]XYc`UbX'h\fc i [\`YbgYa V`Y'dYfZcfa UbW`
&" 8Ya cbghfU]Y`dYfWdh] YZgYbg]h] Y'UbX`]bZcfa YX'dYfY'a Ybhc]b[`g_]`g'h\fc i [\`k cf_]g\cdd]b[`U
dYfY]g'dYfZcfa UbW`% \$`X]g]WggYb]h]mZcf]h]d]gg' c \$`dYfZ'a Ybhc]b[\$`k cf`
' " F YWè[b]gY'UbX'Wèa dUFY'U'VfcUX`fUb[Y`cZfYdYfrc]fY`]b]j Uf]YX'dYfZcfa UbW`ghmYg`

5ggYgga Ybh

5XX]h]bU`]bZcfa Uh]cb`Uj U]UVY`cb`A ccXY"

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K Y][\h	8i Y`8UH`	Gh XYbh@YUfb]b[Ci hWta Yg`5ggYggYX
@]ghYb]b[`HYgh`	&)	\$' #/\$#&\$% `%&.\$\$`DA	`
DYYf`fyj]Yk `	%\$	&* #/\$#&\$% `\$.)\$\$.`DA	&
; fci d`j]XYc`dfc`YWhUbX UWWta dUbn]b[`fYdcfh`	(\$	' %#/\$#&\$% `%%) - `DA	%&
9bgYa V`Y`dUfh]W]dUh]cb`	&)	Bch5dd`]WUVY	%

5ggYgga Ybh8YHU]`g

5ggYgga Ybh%`@]ghYb]b[`HYgh`

GHUfhXUH`.

8YHU]`g. `Gh XYb]g`k]`gh`XmU`gY`YWHX`"]ghcZk cf_g`]bX]WU]b[`j Uf]YX`dYfZcfa UbW`Wc.]Wg`]b`cfXYf`hc Yb\UbW`h`Y]f`dfYdUfU]cb`cZ`h`Y`j]XYc`dfc`YWhUbX`]bWYUgY`_bck`YX[`Y`cZfYdYf]fY`" `W`XYg dfYdUfU]c`fmV`c[`g`k`cf`h`%\$|` "K`f]h]b`ZYXVUW`_Zca`h`UWXYf`"

5ggYgga Ybh&`DYYf`fyj]Yk`

GHUfhXUH`.

8YHU]`g. `Gh XYb]g`k]`k`cf_g`l`cd`dYfZcfa UbW`g`]b`dfYdUfU]cb`VmdYYfg`UbX`gi`Va`]hU`fYdcfhcZ, \$\$ k`cfXg`HYUWXYf`k]`dfcj]XY`k`f]h]b`ZYXVUW`"

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

9UW`gh`XYbhk]`VY`Ugg[]bYX`k`c`a`YbhY`gh`XYb]g`"H\YmUfY`YI`dYWHX`hc`YUX`h`Y`X]gW`gg]cb`cZ`h`Y`g`gh`XYb]g]b!`WUgg`dYfZcfa UbW`Z`UbX`gi`a`a`Uf]gY`h`Y]f`Wta`a`Yb]g`YHW]b`h`Y]f`k`f]h]b`fYdcfh`"

5ggYgga Ybh`.;`fci d`j]XYc`dfc`YWhUbX`UWWta dUbn]b[`fYdcfh`

GHUfhXUH`.

8YHU]`g. `Gh XYb]g`k]`k`cf_]b`U`ga`U`[`fci d`hc`WYUH`U`dYfZcfa UbW`cZ%)`a`]bi`h`gfiXi`fU]cb`cb`j]XYc`#8`J`8`"5`g`l`cfh`fYdcfhXYHU]`]b[`h`Y`dfc`Wgg`cZ`dfYdUf]b[`h`Y`dYfZcfa UbW`UbX`h`Y`j]XYc`k`j`U`gc`VY`fYeI`]fYX`" `W`XYg`k`c`]b!`WUgg`dfYdUfU]c`fmdYfZcfa UbW`g`k`cf`h`%\$|`]b`hc`U`"H\]g`]g`h`Y`Z]bU`UggYgga Ybh`HUg`"HYUWXYf`k]`dfcj]XY`k`f]h]b`ZYXVUW`"

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

H\]g`hUg_]bW`XYg`k`c`]b!`WUgg`dYfZcfa UbW`g`f`%\$|` L`h`Y`j]XYc`f&) |` L`UbX`h`Y`fYdcfhf) |` E`9UW`[`fci d`

dfYdUfYg'cb`mcbY'fYdcfz'hc'VY'gi Va]hYX'UhH\Y'gUa Y'hja Y'Ug'h\Y'j]XYc"'8 i Y'K YXbYgXUm&) h'c'WcVYfz
%%") - 'DA

5ggYgga Ybh(. '9bgYa V'Y'dUfh]W]dUh]cb

GHUfhXUH'.

8YHJ]`g. 'DUfhWX_YW_]b['hYgh'W'cb]Vi h]cb'UbX'dYfZ'fa UbW']b'U'gY'Z'gY'YW'X'I BGK 'YbgYa V'Y"HYUWX'Yf
k]`'dfcj]XY'k f]hY'b'ZYXVUW_"

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

9bgYa V'Y'dUfhWX_YW_]b['k]`'VY'W'ca d'YH'X'VmiH\Y'YbX'cZK YY_'% "

Gi Va]gg]cb'cZ5ggYgga YbhHUg_g

Gh XYbng'UFY'YI dYWX'hc'di hH'Y'f'buA Yg'UbX'ghi XYbhbi a VYfg'cb'Yj YfmdU[Y'cZ'HY]f'Ugg][ba Ybng"

Hi fb]hb'Gi Va]gg]cb

Zmci 'YbWci bHY'U'dfcV'Ya 'k \Yb'UHYa dh]b['hc'gi Va]hrci f'Ugg][ba Ybh'fci [\ 'Hi fb]hb'z'd'YUgY
HY'd\cbY'9I HYfbU'Gi ddcf'hc'b'-' ,) ' ' ' %cf'Ya U]'hYa 'cb'[YI HYfbU'HY'f'gi ddcf'f' i b'gk "YXi "Ui "](#)Gi ddcf'h
\ci fg'UFY' , .\$\$Ua '-'%. \$\$da 'cb'k YY_XUmg'UbX'-. \$\$Ua '-') . \$\$da 'cb'k YY_YbXg'f'l *) 'XUmg'U'mYUf'Zmci
UFY' i bUV'Y'hc'gi Va]hrci f'Ugg][ba YbhXi Y'hc'U'ZU' 'hk]h'Hi fb]hb'rci 'a UmUdd'm'Zcf'Ub'YI HYbg]cb'z'Vi hrci
a i ghf'Y'U]b'rci f'h]W_Yhbi a VYf'Z'ca '9I HYfbU'Gi ddcf'h'U'cb['k]h'Ubmc'h'Y'f'f'Y'Yj Ubh'Xc'W a Yb'ng'k'hc
]b'Wi XY'Ug'Yj]XYb'W'hc'gi ddcf'hrci f'YI HYbg]cb'Udd']W]h'cb" Zmci 'Ya U]'9I HYfbU'Gi ddcf'hrci 'k]'
Ui 'ca U]h'W' 'm'f'Y'W']j Y'U'h]W_Yhbi a VYf'z'Vi h]Zmci 'HY'd\cb'Y'mci 'k]' 'b'Y'X'hc'gd'Y'W'Z'W' 'm'Ug'_Zcf'cb'Y"
Hi fb]hb'U'gc'd'fcj]XY'gi dXU'Y'g'cb'h'Y]f'g'm'g'h'Ya 'gh'U'h'g'cb'Hk]h'f'"

; YbYfU'm'z'UggYgga YbhHUg_g'a i ghVY'gi Va]h'Y'X'Y'Y'W'f'cb]W' 'mj]U'Y]h'Y'f'Hi fb]hb'cf'U'A cc'X'Y
Ugg][ba Ybh' 'b]bg'h'Ub'W'g'k \Y'f'Y'h']g']g' b'chid'cgg]V'Y'z'hk]' 'VY'g'f'U'Y'X'cb'mci f'W'ci fg'Y'g'A cc'X'Y'g]h'Y'k]h'
U'h'f'U'h]j Y'gi Va]gg]cb'XY'U]g"

@UH'5ggYgga YbhDYbU'h]Yg

Gh XYbng'UFY'f'Y'g'd'cbg]V'Y'Zcf'h'Y'gi Va]gg]cb'cZUggYgga YbhHUg_g'Vmi'h'Y'f'Yei]f'Y'X'XU'Y'g'UbX'h'a Yg'
8Yd'YbX]b['cZ'HY'YI HY'h'bcZXY'Um]b'h'Y'gi Va]gg]cb'cZUb'UggYgga YbhHUg_g'dUgh'h'Y'Xi Y'XU'Y'UbX'h'a Yz'
cb'Y'cZ'HY'Z' 'ck]b['UH'd'Yb'U'h]Y'g'k]' 'Udd'mi b'Y'gg'gd'Y'W'U' 'W'c'bg]XY'f'U'h'cb'cf'U'V'Ub_Y'h'YI HY'bg]cb'Xi Y'hc'U'
HY'W'b]W' 'ci]U] Y']g['f'Ub'h'Y'X'": cf'h'Y'di f'd'cg'Y'cZ'U'Y'd'Yb'U'm'W'W'U'h]cb'z'U'X'U'm]g'XY'Ya YX'hc'VY'Y'U'W'
&(!\ci f'd'Y'f]c'X'f'c'f'd'U'f'h'Y'f'Y'c'Z'd'U'gh'h'Y'g'h]di 'UH'X'XY'UX']b'Y'Zcf'gi Va]gg]cb"

- K cf_'gi Va]h'Y'X'Y'gg'h'Ub'%'\$'XUmg'U'Z'h'f'h'Y'g'h]di 'UH'X'XY'UX']b'Y']g'gi V'Y'W'hc'U'XY'Xi W]cb'cZ
) i 'cZ'HY'hc'U'Uk Uf'X'U'V'Y'a Uf_'Z'ca 'h'Y'a Uf_'h'U'hk ci 'X'\Uj Y'V'Y'Y'b'U'W'X]Yj YX']Z'b'ch'Zcf'h'Y'
d'Yb'U'm'Zcf'Yj Y'f'm'X'U'm'd'U'gh'h'Y'g'h]di 'UH'X'XY'UX']b'Y'Zcf'gi Va]gg]cb" H\U'h]g'z'U'gh'XY'bhk '\c'gi Va]hg
Ub'Ugg][ba Ybhk]h'U'g'h]di 'UH'X'XY'UX']b'Y'cZ(. \$\$da 'cb'%' 'A Um'&\$\$* 'Uh(. \$\$da 'cb'%' 'A Um'&\$\$*
k]']b'W'f'U'XY'Xi W]cb'cZ%'\$'i "

HUg_'k]h'U'bc'b d'Y'f'W'b'U] [Y'a Uf_

Z'h'Y'f'Ug_]g'a Uf_Y'X'ci hc'Z&) z'h'Y'b'UH'gi Va]gg]cb'k]' 'U'h'f'U'W'hi'U'd'Yb'U'm'c'Z'U'XY'Xi W]cb'cZ%'&) Z'ca 'h'Y'
a Uf_'Uk Uf'Y'X'hc'h'Y'g'h'XY'bh'Zcf'Yj Y'f'm'&(!\ci f'd'Y'f]c'X'f'c'f'd'U'f'h'Y'f'Y'c'Z'd'U'gh'h'Y'g'h]di 'UH'X'XY'UX']b'Y'"

- K cf_gi Va]hYX %\$'hc '%- 'XUmg 'UZhf'h'Y'gh]di 'UhYX'XYUX`]bY'k]''VY'UggYggYX'UbX'ZYXVUW_dfcj]YXX'Vi hU'a Uf_cZnYfc'k]''VY'fYWcfYXX''Z'hY'k cf_k ci 'X'\Uj Y'fYW]j YX'U'dUgg'a Uf_Vi hZcf hY''UhY'bYgg'UbX'hY'k cf_]g'U'Wta di `gcfmWci fgY'Wta dcbYbhfli fX'Y'fYei]fYa YbHžU'ghi XYbhk]''VY'XYYa YX'hc'\Uj Y'a Yh'hUhfYei]fYa Ybh'
- K cf_gi Va]hYX &\$'cfa cfY'XUmg 'UZhf'h'Y'gh]di 'UhYX'XYUX`]bY'k]''bchVY'UWW'dhYX'Zcf UggYgga YbhUbX'k]''fYW]j Y'bc'ZYXVUW_ž'a Uf_cf[fUXY''Z'hY'UggYgga YbhUg_]g'U'Wta di `gcfm Wta dcbYbhcZ'hY'Wci fgY'U'ghi XYbhk]''fYW]j Y'Ub'l bgUh]gZUWcfm: U]'fl : Ł'[fUXY'Ug'U'fYgi `hcZ i bgUh]gZUWcfmdYfZcfa UbVW`]b'Ub'YggYbh]U'Wta dcbYbhcZ'hY'Wci fgY''

H\]g`]bZcfa Uh]cb`]g'U'gc'Uj U]UV'Y'Uh

[\h\]g.#k k k "Ufmg"i bgk "YXi "Ui #W ffYbH\]ghi XYbmg#JWJXYa \]W\]bZcfa Uh\]cb#dfchWc`g!\[i \]XY`\]bYg#](#)

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

D`U[]Uf]ga `]g`i g]b[`hY`k cfXg`cf]XYUg`cZchYfg`UbX`dfYgYbh]b[`hYa `Ug`mci f`ck b" `hWUb`hU`Y`a Ubm
Zcfa gZ`Zca `XY`]VYfUHY`WXYU]b[`hc`UWV]XYbhU`mW`dm]b[`Zca `U`gci fW`k]h`ci hUW_bck`YX[Ya Ybh`

I BGK `[fci dg`d`U[]Uf]ga `]bhc`hY`Zc`ck]b[`WUHY[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`dfYgYbh]g`UbchYf`g`]XYUg`cf`k cfXg`k]h`ci hWYX]h`

hUddfcdf]UHY`dUfUd`fUg]b[.`7`Ub[]b[`U`ZYk`k cfXg`UbX`d`fUgYg`k`Y`a cghmiFYhU]b]b[`hY`cf][]bU`
ghfi`W`fY`UbX`#`f`dfc[fYgg]cb`cZ]XYUg`cZ`hY`cf][]bU`Z`UbX`]bZcfa`U]cb`k]h`ci hUW_bck`YX[Ya Ybh`H\]g`U`gc
Udd`]Yg`]b`dfYgYbhU]cbg`k \YfY`gca YcbY`dUfUd`fUgYg`UbchYf`g`]XYUg`cf`k cfXg`k]h`ci hWYX]hU`bX`hc
d]YW]b[`hc[YhYf`ei chYg`UbX`dUfUd`fUgYg`]bhc`U`bYk`k \c`Yz`k]h`ci hUddfcdf]UHY`fYZYfYbW]b["

7 c`i g]cb.`k cf_]b[`k]h`chYfg`Vi hdUgg]b[`cZ`hY`k cf_]Ug`U`dYfgcb`g`]bX]j]Xi`U`k cf_"`7 c`i g]cb`U`gc

- i bXYfghUbx'mci f'f][\hg'UbX'fYgdcbg]V]]hYg'Ug'U'gh XYbhUhl BGK
- VY'Uk UfY'cZd'U[]Uf]ga ž'Wc'dmf][\hž' BGK 'Gh XYbh7cXY'cZ7cbXi W'Ubx'5W'W'dhUV'Y'I gY'cZ I BGK '⇒H'F'Ygci f'W'g'Dc']W'h
- VY'Uk UfY'cZ'Y'ghUbxUfXg'cZVY\Uj]ci f'YI dY'W'X'cZYj Yfmc'by']b'h'Y'I BGK 'W'a a i b]m
- 'cW'W'h'gYfj]W'g'UbX']bZ'fa U'h'cb'UVci hl BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZ'Y'gY'UfY'Ug'k]''VY'ZJa]]Uf'hc'mci ž'c'h'Yfg'k]''VY'byk " ; U]b]b['U'gc']X'i bXYfghUbx]b['cZU''h'Y fY'U'h'X'UgdY'W'g'cZ9@-G9'k]''\Y'd'mci 'a U_Y'h'Y'a cgh'cZ'mci f'gh X]Yg'Uhl BGK "

[f\ htd. #gi V'Y'W'f' i \]XYg' \]VfUfm'i b'gk "YXi "Ui #'\]gY#UVci h' \]gYŁ](#)

7 ci fgY'GWXYXi `Y

[J.Jyk`WUgg`ĥa YĥUV`Y](#)

H]a YĥUV`Y`

8UHŸ	HmŸY	7cbĥYbh
K YY_%&'>i`m!`&->i`m	GYa]bUf	ĥfçžfYj]Yk`k f]ĥb[ž`]ghŸb]b[`ĥYgrž]bXi W]cb`Zçf`5J Yei]da Ybh
K YY_&.`\$>i`m!) 5i [i gh	Gĥ X]c	DYfZ5`f\U`ZWĥ\çfh5Ě
K YY_`.*`5i [i gh!`%& 5i [i gh	Gĥ X]c	DYfZ5`f\U`ZWĥ\çfh6Ě
K YY_(`.%`5i [i gh!`% 5i [i gh	GYa]bUf	; i Ygh`A Ufĥb: çl ž7 fYUĥb[`A i g]WJ]XYçg
K YY_)`.&\$`5i [i gh!`&` 5i [i gh	Gĥ X]c	DYfZ5`f\U`ZWĥ\çfh5Ě
K YY_*.`&+`5i [i gh!`& GYdĥYa VYf	Gĥ X]c	DYfZçfa UbW`5.`<U`ZWĥ\çfh`6
K YY_+.`GYdĥYa VYf!`- GYdĥYa VYf	GYa]bUf	GYa]bUf`A U[[]Y: Yf[i gcbžĥUb[ç
K YY_`.%.`GYdĥYa VYf! %*`GYdĥYa VYf	Gĥ X]c	DYfZ6`f\U`ZWĥ\çfh5Ě
K YY_`.%.`GYdĥYa VYf! &`GYdĥYa VYf	Gĥ X]c	DYfZ6`f\U`ZWĥ\çfh6Ě
6fYU_`&(`GYdĥYa VYf! `\$`GYdĥYa VYf	Gĥ X]c	
K YY_%.`%C`WçVYf!`+ C`WçVYf	GYa]bUf	@]ghŸb]b[`ĥYgh
K YY_%%`,`C`WçVYf!`%ç C`WçVYf	Gĥ X]c	DYfZ6`f\U`ZWĥ\çfh5Ě
K YY_%.`%`C`WçVYf! &%C`WçVYf	Gĥ X]c	DYfZçfa UbW`6`f\U`ZWĥ\çfh6Ě

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

GdYwZ]WfYgci fWg`k]`VY`a UXY`Uj U]UV`Y`h`fci [\ `A ccX`Y"

F YWc a a YbXYX`F Ygci fWg

BchiUj U]UV`Y

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

H\Y`Wti fgY`k]`VY`Yj U`i UhYX`h`fci [\ `a m9I dYf]YbW`]b`k YY_g`%%UbX`%&"`#`fYgdcbgY`hc`dfYj]ci g
Yj U`i Uh]cbg`h`Y`]g`h`b]b[`Ugg][ba Ybh\Ug`VYYb`gi VghUbh]U`mi dXUhYX"

⇒ U[Y`7 fYX]h

H\]g`d\c`hc[fUd\`]g`a mdfcdYfm`f

7F ⇒ CG

7F ⇒ CG`Dfcj]XYf`7cXY.`\$\$\$- , ;