



MUSC1703

DYfZcfa UbWV '@JVc fUhc fm%

GYa YghYf'C bY''##'&\$%



GWcc``cZHAY'5ftg'UbX'A YXJU''##'1 BGK ``5ftg'UbX'GcWJU``GWYbWg

7 ci fgY`Cj Yfj]Yk

`GHUZZ`7 cbhUW`i8YHU]`g`

`7 cbj Ybcfg`

B Ua Y	9a U]`	5j U]`UV]`]m	@cW]h]cb	D\cbY
? ja `6i fk Y``	_"Vi fk Y``4 i bgk "YXi "Ui	6mUddc]bha Ybhj]U Ya U]`	K YVghYf`F cca %%\$	

`@YWi fYfg`

B Ua Y	9a U]`	5j U]`UV]`]m	@cW]h]cb	D\cbY
@Ui fU`7`]\g`Ym	"VX]g`Ym`cbYg4 i bgk "YXi "Ui	6mUddc]bha Ybhj]U Ya U]`		

GWXcc``7 cbhUW`i`bZcfa U]h]cb

F cca `! %&Z`Yj Y`` `F cVYfhK YVghYf`6i]X]b[

D\cbY. f\$&L`- ' ,) `(,) *

9a U]: [gUa 4 i bgk "YXi "Ui](#)

K YVg]hY: [\hmg.#gUa "Ufmg"i bgk "YXi "Ui](#)

: cf'a cfY`]bZcfa Uhcb`UVci h`hY`UHYbXUbW`dfcfcWc`g`]b`h`Y` : UW`hmcZ5fng`UbX`GcWU`
GWYbWg. [\hfdg.##k k "Ufng"i bgk "YXi "Ui #W ffYbhghi XYbfg#UWUXYa \]W\]bZcfa Uhcb#dfcfcWc`gl\[i \]XY`\]bYg#](#)

5WUXYa]WbZcfa Uhcb`

: cf`YggYbh]U`ghi XYbh]bZcfa Uhcb`fY`UHb[`fc. fYei Ygrg`Zcf`YI h`bg]cb/fYj]Yk`cZa Uf_g/cWW`dUhcbU`YU`h`
UbX`gUZ`m`YI Ua]bUhcb`dfcW`Xi fYg/gdYWU`Wc`bg]XYfUhcb`]b`h`Y`Yj Ybhcz]`bYgg`cf`a]gUXj Ybh fY/
ghi XYbhYei]mUbX`X]gUV`]m`UbX`ch`Yf`YggYbh]U`UWUXYa]W]bZcfa Uhcbz
gYY` [\hfdg.##k k "Ufng"i bgk "YXi "Ui #W ffYbhghi XYbfg#UWUXYa \]W\]bZcfa Uhcb#dfcfcWc`gl\[i \]XY`\]bYg#](#)

7ci fgY'8YHJ`g

7fYX]hDc]bng`*`

Gi a a UfmicZh\Y'7ci fgY

Gi VYWh5fYU.`? ge[U

65`DYfZcfa UbW`@UVcfUhcfm%XYj Y`cdg`g_]`g`]b`W`cdYfUhj Y`a i g]WJ`dYfZcfa UbW`h`fci [\`YbgYa V`Y
gh XmUbX`W`bW`fng`"H\Y`W`i fgY`]bWi XYg`dUfh]W`dUhc]b`]b`U`gY`Z`gY`Y`W`X`j cWJ`cf`]bngfi a YbU`YbgYa V`Y`Z
dYfZcfa UbW`k`cf`g`cdg`z`UbX`7`cbW`fhiDfUW]W`Z`U`Z`fi a`h`U`hd`fcj`]XYg`U`d`U`h`Z`fa`Z`c`f`cd`Y`b`d`Y`f`Z`c`fa`UbW`g
UbX`d`Y`Y`f`W`]h]W`ga`"

5h\Y`W`bWi`g]cb`c`Z`h`]g`W`i`fgY`h`Y`g`hi`XYbhk`]``V`Y`U`V`Y`h`c`

%`8`Ya`cbghfUhy`Ub`UV`]m]h`k`cf`_`Y`ZY`W]j`Y`m]b`a`i`g]WYbgYa`V`Y`g`
&`≡`i`ghfUhy`c`V`g`Y`f`U`h`cb`U`UbX`]gh`b]b[`_`g_]`g`]b`a`i`g]WdYfZcfa`UbW`h`fci`[`\`k`f]h`b`UbX`j`Y`f`V`U`
W]h`ei`Y`g`
'`" `8`Ya`cbghfUhy`W`ffY`Wh`dc`gh`f`Y`Z`Z`i`Y`b`W`h`UbX`W`ffY`Wh]b`h`c`b`U`h`c`b`

HYUW]b[`GhfUhy[]Yg`

h`c`f`X`Y`f`h`c`X`Y`j`Y`c`d`h`Y`f`Y`ei`]f`%`h`W`b]W`]g`W]g`UbX`U`Y`gh`Y`h]W`_`b`c`k`Y`X`[`Y`Z`c`f`Y`b`g`Ya`V`Y`d`Y`f`Z`c`fa`UbW`Z`6`5`
DYfZcfa UbW`@UVcfUhcfm%gh`XYbhg`U`f`Y`f`Y`ei`]f`Y`X`h`c`gh`XmUbX`d`U`f`h]W`d`U`h`]b`U`f`U`b`d`d`d`

5ggYgga Ybh

D`YUgY`bchY`hUhU`UggYgga YbhHUg_g`k`j`VY`X]gW`ggYX`]b`hLY`Z]fgh`YW`fY`":`cf`U`Ugg][`ba`YbhgZ`hLY`<`Ufj`UfX`cf`5D5`fYZfYbW]b[`gmg]Ya`g\ci`X`VY`i`gYX`"D`YUgY`fYZf`h`i`BGK`fYZfYbW]b[`i`]XY`cb`]bY`Zcf`XYHJ]`g"

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_g`	K`Y][`h	8i`Y`8UH`	Gh`XYbh@YUfb]b[`Ci`hW`a`Yg`5ggYggYX`
DYfZcfa`UbW`W]h]ei`Yg`	&)`i	Bch5dd`]WUV`Y`	&
DYfZcfa`UbW`k`cf_g\cd`	&)`i	Bch5dd`]WUV`Y`	&Z
9bgYa`V`Y`W`b]f]Vi`h]cb`UbX`dUfh`VX`YW_]b[`)`\$i	Bch5dd`]WUV`Y`	%Z

5ggYgga Ybh8YHJ]`g`

5ggYgga Ybh%`DYfZcfa`UbW`W]h]ei`Yg`

GhUfhXUH`. `Bch5dd`]WUV`Y`

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

8YHJ]`g.`Dcgha`]b]a`i`a`"XfUZhW]h]ei`Yg`cb`]bY`Vma`]Xb][`h]cZ`hLY`XUm]gdYW]Z]YX`Z`ck`]b[`DYfZcfa`UbW`gYa`]bUfg`"9UWX`W]h]ei`Y`)`\$!(`\$\$`k`cfXg`"HYUWX`Yf`fYgdc]bgYg`h]fci`[`U`V`c[`"

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

Mci`k`j`W`b]f]Vi`h]h`fY`W]h]ei`Yg`cZdYfZcfa`UbW`g`UbX`#`f`W`a`a`Ybhg`cb`dYfZcfa`UbW`!`fY`UH`X`]ggi`Yg`j`]U`Ub`cb`]bY`Zcf`i`a`"Mci`k`j`W`ccgY`h`fY`ci`hcZ`Z]`Y`W`c]W]g`Zcf`dc]hg`":`i`XYHJ]`g`cZ`hLY`fYei`]fYa`Ybhg`Zcf`YUWX`dc]ghk`j`VY`Uj`U]UV`Y`cb`A`ccX`Y`cb`YW`fY`#`UghY`fWUgg`XUm]g`"Dcgh]mci`f`W`a`a`Ybhg`]b`hLY`k`YY`_`Z`ck`]b[`YUWX`YW`fY`#`UghY`fWUgg`"

Gi`Va`]gg]cb`bchY`g.`bi`"

Hi`fb]h]b`gYH]b[`.`h\]g`]g`bchU`Hi`fb]h]b`Ugg][`ba`Ybh`

5ggYgga Ybh&.`DYfZcfa`UbW`k`cf_g\cd`

GhUfhXUH`. `Bch5dd`]WUV`Y`

@Yb[`h.`)bi`"

8YHJ]`g.`)!\$`a`]bi`h`XYa`cb]ghU]h]cb`#]fYgYb]h]cb`cb`W`b]h]i`h`U`]ggi`Y`]b`a`i`g]WU`dYfZcfa`UbW`Zcf`fYdYf]c]fY`i`bXYf`gh`Xm`HYUWX`Yf`UbX`dYfY`fYj`]Yk`"

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

8Ya cbgfhUjcbg#dfYgYbhUjcbg:k]`hU_Y'd`UW`Xi f]b[`hY`h]fX`UbX`Zci fh`k cf_g\cd'gYgg]cbg"H\Y`cfXYf`cZ
dfYgYbhUjcbg:k]`VY`XYW`XYX`VmVU`chUbX`dcghYX`cb`A`ccX`Y`Vm`hY`YbX`cZK`YY`_%`5b`ja`dcfhUbhU]a
k]`VY`hc`g\ck`ck`mci`Uj`Y`Yb\UbVWX`mci`f`dfUW`W`k`cf`_`h`fci`[\`fYUX]b[`UbX`]ghYb]b["Hc`gi`ddcfh
mci`f`XYa`cbgfhUjcb#dfYgYbhUjcbz`mci`g\ci`X`gi`Va`j`hU`g\cfhXcW`a`Ybhfa`U]`ja`i`a`%g]XY`cZ5`(`L`bW`X]b[
hY`h`hY`UbX`U`gi`a`a`UfmcZ`mci`f`dc]bhgzk`]h`U`V`V`c[`fUd`m`]gh]b[`mci`f`gci`fW`g"H\Y`XcW`a`Ybhg\ci`X`VY
gi`Va`]hYX`cb`a`ccX`Y`cb`hY`gUa`Y`XUmUg`mci`f`dfYgYbhUjcb"H\Y`Ybh]fY`XYa`cbgfhUjcb#dfYgYbhUjcb
g\ci`X`VY`WUfYZ`m`h]a`YX`UbX`Ugh)!%\$`a`]bi`hY`g`k`]h`h]a`]b[`Vcbg]XYfYX`dUfhcZ`hY`hUg`""

Gi Va]gg]cb`bchYg.bi ``

T u r n i H i f b] H e g Y h] b g : H \] g] g d c h U H i f b] h] b g d g] a b a M b h

5ggYgga Ybh' . '9bgYa V`Y`Vcbhf]Vi h]cb`UbX`dUfhWX`YW_]b[

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gh XYbng`UfY`YI dYW`X`hc`di h`h`Y`f`b`Ua`Yg`UbX`gh`XYbhbi`a`VYfg`cb`Yj`YfmdU[`Y`c`Z`h`Y`f`Ugg][`ba`Ybng`"

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

z`mci`YbWci`bHf`U`dfcV`Ya`k`Yb`U`H`Ya`d]b[`hc`gi`Va`]hmc`f`Ugg][`ba`Ybh`h`fci`[`h`Hi`fb]h]b`z`d`YUgY`
H`Y`d`l`cb`Y`9I`H`f`b`U`G`i`d`d`c`f`h`c`b`-`'`,`)`''`'`'`%`c`f`Ya`U`]`h`Ya`'`cb`[YI`H`f`b`U`H`f`gi`d`d`c`f`h`i`b`gk`"Y`X`i`"U`i`"](#)Gi`d`d`c`f`h`
`l`ci`f`g`U`f`Y`,`.`\$\$Ua`-`-%\$.`\$\$da`'`cb`k`YY`X`U`mg`U`b`X`-`.`\$\$Ua`-`i`).`\$\$da`'`cb`k`YY`Y`b`X`g`f`l`*)`X`U`mg`U`m`Y`U`f`l`"z`mci`
U`f`Y`i`b`U`V`Y`'`hc`gi`Va`]hmc`f`Ugg][`ba`Ybh`Xi`Y`'`hc`U`Z`U`'`h`k`]`h`'`Hi`fb]h]b`'`mci`'`a`U`m`i`U`d`d`'`m`i`z`c`f`U`b`'`Y`I`H`f`b`g]cb`z`Vi`h`mc`i`
a`i`g`h`f`Y`h`U]b`'mci`f`h]W`Y`h`bi`a`V`Y`f`Z`c`a`'9I`H`f`b`U`G`i`d`d`c`f`h`f`U`'`cb[`'k`]`h`'`U`b`m`c`h`Y`f`f`Y`j`U`b`h`X`c`W`a`Y`b`h`g`k`'`hc`
]b`W`i`X`Y`U`g`Y`j`]X`Y`b`W`'`hc`gi`d`d`c`f`h`mci`f`Y`I`H`f`b`g]cb`U`d`d`'`j`W`h]cb`"z`mci`'`Ya`U`]`9I`H`f`b`U`G`i`d`d`c`f`h`mci`'k`]`
U`i`'`hc`a`U`h]W`U`'m`i`f`Y`W`]j`Y`U`'h]W`Y`h`bi`a`V`Y`f`z`Vi`h]z`mci`'H`Y`d`l`cb`Y`'mci`'k`]`'b`Y`Y`X`'hc`'g`d`Y`W`Z`W`U`'m`i`U`g`_`z`c`f`c`b`Y`"

f`G][b]Z]W]b]h]m]U]Z]Y]W]h]m]c]i] f]d]Y]f]Z]c]f]a] U]b]W]W]]b]U]g]g]Y]g]g]U]V]`Y]`k] c]f]_]Z]V]Y]`]h]U]`Z]c]f]a] U]`Y]b]X]!]c]Z]g]Y]a] Y]g]h]f]`Y]I] U]a]]b]U]h]c]b]Z]U] W]U]g]g]`h]Y]g]h]Z]U]`U]V]c]f]U]h]c]f]m]h]Y]g]h]Z]U]`g]Y]a]]b]U]f]d]f]Y]g]Y]b]h]U]h]c]b]`c]f]U]b]m]c]h]Y]f]Z]c]f]a] `c]Z]U]g]g]Y]g]g]a] Y]b]h]

: c]f]Z] f]h]Y]f]X]Y]h]U]`g]`]b]`f]Y]`U]h]c]b]`h]c]`G]d]Y]W]U]`7]c]b]g]X]Y]f]U]h]c]b]`]b]W]i] X]b] [`]K] \]Y]b]`h]c]`5]d]d]`m]Z]`<]c]k] `h]c]`5]d]d]`m]`U]b]X] `G]i] d]d]c]f]h]b] [`]8]c]W]a] Y]b]h]U]h]c]b]`d]`Y]U]g]Y]`f]Y]Z]f]`h]c]`h]Y]`G]d]Y]W]U]`7]c]b]g]X]Y]f]U]h]c]b]`k] Y]V]g]h]Y]`.

[\\]h\]c\]g.\]#\]g\]h\] X\]Y\]b\]h\]i\] b\]g\]k\] "Y\]X\]i\] "U\]i\] #\]g\]d\]Y\]W\]U\]!\]W\]c\]b\]g\]X\]Y\]f\]U\]h\]c\]b\]](#)

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 gž Zca `XY`]VYfUHy`WXYUh]b[`hc`UWV]XYbU`miW`dm]b[`Zca `U`gci fW`k]hCi 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]hCi hUW_bck `YX[]b[`hY
gci fW`cf`i g]b[`ei chU]cb`a Uf_g`H\]g`U`gc`Udd`Yg`hc`ja U[YgžUfhUbX`XYg][b`dfc`YWgžUg`k Y`Ug
dfYgYbU]cbg`k \Yfy`gca YcbY`dfYgYbh]b[UbchYf`g:]XYUg`cf`k cfXg`k]hCi hWYX]hY[cf]Yg.

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

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

F]b_ž">"žYX""&\$\$&"`A i g]WU`dYfZcfa UbWV. U`[i]XY`hc`i bXYfghUbX]b["7 Ua Vf]X[Y. 7 Ua Vf]X[Y`I b]j Yfg]hm DfYgg

F YWca a YbXYX`F Ygci fWg

D`YUgY`bchY`I BGK `@]VfUfmk YVg]hY. [\hd.##bZ`~\]VfUfmi bgk "YXi "Ui # YV#gYfj \]Wg#gYfj \]Wg`\fa`](#)

7cc_YžA "/`8" <cfb"&\$\$' ""H\Y`7 Ua Vf]X[Y`Wca dUb]cb`hc`U`nn"7 Ua Vf]X[Y. 7 Ua Vf]X[Y`I b]j Yfg]hm DfYgg"

; `mbbžA UWBcbU`X""%- , ""H\Y`Wca d`YH`i`i ghfUH`X`[i]XY`hc`5`YI UbXYf`h`W`b]ei Y`G\UžYgVi fr` 8`cfgYh 9`Ya Ybh`

; fYYbž6"/`H"; U`k Ym`% , *""H\Y`]bbYf`[Ua Y`cZa i g]W`BYk`Mcf_`8`ci V`YXUm

<YfVYfž`H"/`>"`K U`UW""%- +""H\Y`7 Ua Vf]X[Y`Wca dUb]cb`hc`VfUgg`]bgf`i a Ybhg"7 Ua Vf]X[YžBYk`Mcf_`7 Ua Vf]X[Y`I b]j Yfg]hmDfYgg"

@Uk gcbž7"/`F`"G`hck Y`""&\$\$&"`H\Y`7 Ua Vf]X[Y`\]ghcfmicZa i g]WU`dYfZcfa UbWV"7 Ua Vf]X[Y. 7 Ua Vf]X[Y`I b]j Yfg]hmDfYgg"

DchYfž">"&\$\$\$`H\Y`7 Ua Vf]X[Y`Wca dUb]cb`hc`g]b[]b["7 Ua Vf]X[Y. 7 Ua Vf]X[Y`I b]j Yfg]hmDfYgg"

K YgfbYnžK ""&\$\$' ""H\Y`dYfZYW`ik fcb[`bchY`"BYk`Mcf_`5a UXYi g

K]`]Ua cbž5""&\$\$(`"A i g]WU`YI W`Y`bWV. ghfUH`[]Yg`UbX`h`W`b]ei Yg`hc`Yb\UbW`dYfZcfa UbWV"C I Zcfx. C I Zcfx`I b]j Yfg]hmDfYgg"

>ci fbU`g`

A i g]WDYfZcfa UbWV`F YgYUfWV`-`Ub`cb`]bY`fYZYfYX``ci fbU`-`[\hd.##a dflcb`\]bY`bYh`](#)

žZcfa Uh]cb`UVci hd\mg]WU`UbX`Yf[cbca]WUgdYWg`cZdYfZcfa UbWV`di V`]g\YX`Vm`h`Y`G]VY`]i g`5`WXYa nž :]b`UbX`

[\hd.##k k k &g\]VU"Z`Uf`c`\]hY`i #bXYI "d\d3\]X1& `U1Yb`](#)

žbgf`i W]cbU`j]XYcg`UVci h`h`Y`HUi Va Ub`UddfcUWV`hc`d`]Ubc`h`W`b]ei Y`Uh`

[\hdg.##k k k "mci h`VY`Wca #`gYf#HUi Va Ub: c`UbXg`mi`](#)

6f]hg\`5ggcWUh]cb`cZDYfZcfa]b[`5f`g`A`YX]W]bY`g]hYžYgdYWU`m]bZcfa Uh]cb`Zcf`[i]hUf]ghg`UbX`g]b[Yfg \hd.##k k k "VUdUa "cf["i`_`%`6`Uffmi; fYYbžA UghYfmicZA i g]WWW]dg`

[\hdg.##k k k "mci h`VY`Wca #`UfW3j`1*K`_bm` : \[Bb5`](#)

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

Gh XYbhZYXVUW_]g'fYei YghYX'gc'h UhVW Ub[Yg'WJb'VY'Wcbg]XYfYX']b'cfXYf'hc'Yb\UbW' hY'gh XYbh
'YUfb]b['YI dYf]YbW' "Mci 'k]''VY'UV'Y'hc'Wca d'Yh' hY'a m9I dYf]YbW' Yj U'i Uh]cbg'cb']bY'hc k UfXg'hY'YbX
cZgYa YghYf" Gh XYbhg'UfY'YbWci fU[YX'hc'X]gW gg'Ubmia UthYf'fY'UhYX'hc'h']g'Wci fgY'UbX'dfcj]XY'ZYXVUW_
h'fci [\ci h'hY'gYa YghYf'k]h'hY'Wci fgY'Wcbj Ybcf" 5''ZYXVUW_ 'k]''VY'X]gW ggYX'Vmi'hY'a i g]WghJZ'

⇒ U[Y'7 fYX]h

6cX]Yg/ ' b'hYfZJW'g'&\$%*

7F ⇒ CG

7F ⇒ CG'Dfcj]XYf'7cXY.'\$\$\$- , ;