



MUSC2702

DYfZcfa UbWV '@JVcfUhc fm(

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

GWcc``cZH Y`5ftg`UbX`A`YXJU`..#`I`BGK`..5ftg`UbX`GcWJU`..GWYbWg



: cf`YggYbh]U`gh XYbh]bZcfa Uh]cb`fY`Uh]b[`rc.`fYei Yg]g`Zcf`YI hYbg]cb/fYj]Yk `cZa Uf_g/cVW dUh]cbU`YU`h

7 ci fgY'8YHJ]`g

7 fYX]hDc]bqg`*`

Gi a a UfmcZ\hY'7 ci fgY

Gi VYWh5fYU.'? ge[U

DYfZcfa UbW'@UVcfUrcfm('Z f\hYf'XYj Y`cdg'UbX'Wcbgc`XUH'g'g_]`g`j'b'gc'c'dYfZcfa UbW'cf'Wca dcg]hcb
UbX'YbgYa V'Y'dYfZcfa UbW'h'fci ['\dUfh]W]dU]hcb`j'b'Ub'YbgYa V'Y'Z'WcbW'fhg'UbX'k'cf_g\cdg" H\Y'Wci fgY
]bWi XYg]bXj] Xi U`]bghfi W]cb`j'b'U'j'cW'cf`]bghfi a YbH'gdYW]U]gU]hcb'cf'Wca dcg]hcb`Ug'k'Y`Ug
dUfh]W]dU]hcb`j'b'U'gY'ZgY'YW'X'j'cW'UbX'cf`]bghfi a YbH'YbgYa V'Y'"5 hYbXUbW'UbX'dUfh]W]dU]hcb`]g
fYei]fYX]b'f\`DYfZcfa UbW'GYa]bUf'Z'U'Z'fi a 'h'Uhd'fcj]XYg'U'd'U'Z'cfa 'Z'f'cdYb'dYfZcfa UbW'g'z
a Ugh'fWUggYg'UbX'd'Y'f'W]h]W]ga 'Z'UbX]b'f\`DYfZcfa UbW'#7 ca dcg]hcb`K'cf_g\cd'Z'U'Z'fi a 'h'U]h]bWi XYg
h'Y'X]gW'gg]cb'UbX'XYa cbgh'U]hcb'c'Z'dYfZcfa UbW'#7 ca dcg]hcb`h'W]b]ei Yg'z'h'Y'W]h]W]g_]`g'fYei]fYX'Z'cf
h'Y'j'bXYdYbXYbhgh XmcZa i g]WdYfZcfa UbW'z'UbX'UgdYW'g'cZa i g]W'g'mY'UbX'Ufh]g]h]W]b'h'fd'fY'U]hcb"

5 h\h'Y'WcbWi g]cb'cZ\h]g'Wci fgY'h'Y'ghi XYbhk]`VY'UV'Y'hc

- % 8 Ya cbghfU]h'Y'W]b]W]gYW'f]m'z'WcbZ]XYbW'UbX'U`_YYb'gYbgY'cZ\h'Y'Ufh]g]h]W]fYei]fYa Ybhg'bYYXYX
Z'f'dYfgi Ug]j'Y'a i g]W'U'dYfZcfa UbW'z'dUfh]W'Ufm]b'h'Yfa'g'cZ'rcbU'UbX'XmbUa]WfUb[Y'UbX
ghfi W]h'fU'd'Ubb]b[]b'U]h'Y'Ugh'k'c'gY'YW'X'g'mYg'cf[Yb'fYg'cf]b'h'Y'W]gY'cZ'Wca dcg]hcb
gdYW]U]g]h'g'z'XYa cbghfU]h'j'b'XYd'h'_'bck'YX[Y'cZ]bghfi a YbH'U'h]a V'fYg'UbX'h'Y]f'fY'U]hcbg\]d'hc
h'I'h'fU'VU'UbW'j'b'j'Uf]ci g'YbgYa V'Yg'z'UbX'Ub'U]X'UbW'X'i bXYfg]h]b]b['cZa i g]W'g'ghfi W]h'fY'UbX
Wca dcg]hcbU'h'W]b]ei Yg]b'h'k'c'cf'a'cfY'a i g]W'U'[Yb'fYg"
- &" 8 Ya cbghfU]h'Ub'UV]j]m'hc'k'cf_'YZY'W]j'Y'm]b'a i g]WYbgYa V'Yg'UbX'g\ck'U'W]h]W]Uk'UfYbYgg'cZ
h'Y'j'Uf]ci'g'fc'Yg]bj'c'j'YX'UbX'U'W]dU]h]m'hc'h'U'Y'cb'a]bcf'YUXYfg\]d'fc'Yg'Ug'fYei]fYX"
- ' " 8 Ya cbghfU]h'dYfW'dh]j'Y'W]h]W]g]h'Y'b]b[]g_]`g`j'b'a i g]WdYfZcfa UbW'h'fci ['\k'f]h'Y'UbX'j'YfVU'
W]h]ei Yg'cf]bg][\h]b'hc'Wcb'h'Ya dcfUfmk'cf_g'h'fci ['\a i g]W'U'UbU'm]g]"

HYUW]b['GhfU]h[]Yg'

⊕'cfXYf'hc'XYj Y`cd'h'Y'fYei]fYX'h'W]b]W]UbX'UYgh'Y]h]W]g_]`g`j'b`]bghfi a YbH'cf'j'cW'U'dYfZcfa UbW'z'cf
Wca dcg]hcbz'DYfZcfa UbW'@UVcfUrcfm('gh'XYbhg'UfY'fYei]fYX'hc'f]E'i bXYfU_Y'df]j'U]h'gdYW]U]gh
]bghfi a YbH'z'j'cW'U'cf'Wca dcg]hcb`]bghfi W]cb'f\`\$'\ci fg'a]b]a i a E'f]E'U]h'Y'UbX'UbX'dUfh]W]dU]h'j'b
DYfZcfa UbW'GYa]bUf'Z'Ub'cdYb'Z'fi a 'h'Uhd'fcj]XYg'a Ugh'fWUggYg'z'di V]WdYfZcfa UbW'Yi dYf]YbW'UbX
h'Y'cddcfh]b]m'hc'XYj Y`cd'g_]`j'b'a i g]W]h]W]ga 'f] '\ci fg'dYf'gYgg]cbE'Ug'k'Y`Ug
DYfZcfa UbW'#7 ca dcg]hcb`K'cf_g\cdg'f] '\ci fg'dYf'gYgg]cbE'UbX'f]]E'dUfh]W]dU]h'j'b'U'gY'ZgY'YW'X
YbgYa V'Y'f\`\$'\ci fg'dYf'gYgg]cbE"

5ggYgga Ybh

: cfa U`UggYgga YbhVf]Yz`k]`VY`[] Yb`cb`a ccX`Y`Zc`f`h`Y`W]`h`ei Yg`UbX`]b!WUgg dYfZcfa UbVW#dfYgYbhU]cb`"

⊕`c`f`X`Y`f`h`c`a`U`l`]a`]g`Y`d`Y`f`Z`c`f`a`U`b`V`W`c`d`d`c`f`h`b`]h`Y`g`Z`c`f`Y`j`Y`f`m`c`b`Y`X`i`f`]b`[`h`Y`g`Y`a`Y`g`h`Y`f`z`U`g`g`Y`g`g`Y`X` d`Y`f`Z`c`f`a`U`b`V`W`#`d`f`Y`g`Y`b`h`U`]`c`b`g`k`]`V`Y`g`W`X`Y`X`i`Y`X`c`b`m`]b`k`Y`Y`_`g`%`\$`%`%`/`%`&`"``H`c`U`V`W`a`a`c`X`U`h`Y`h`Y`b`i`a`V`Y`f`g`z` h`Y`f`Y`k`]`V`Y`U`b`U`X`X`]h`c`b`U`g`Y`g`g`]c`b`c`b`A`c`b`X`U`m`]b`K`Y`Y`_`%`%`"``M`c`i`b`Y`Y`X`U`h`Y`b`X`c`b`m`h`Y`g`Y`g`g`]c`b`]b`k`\\]W` m`c`i`U`f`Y`g`W`X`Y`X`i`Y`X`h`c`V`Y`U`g`g`Y`g`g`Y`X`z`X`i`f`]b`[`k`Y`Y`_`g`%`\$`%`%`/`%`&`"

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K Y][\h	8i Y`8UH`	Gh XYbh@YUfb]b[Ci hWta Yg`5ggYggYX
7 f]h]W]`f`Y`j`]Yk`U`b`X`f`Y`d`c`f`h`k`f`]h`b`[`	%)	Bch5dd`]W]V`Y`	'
K`c`f`_`g`l`c`d`d`f`Y`g`Y`b`h`U`]`c`b`	%)	Bch5dd`]W]V`Y`	%z
9bgYa V`Y`d`U`f`h`Y`g`h`b`[`	&\$)	Bch5dd`]W]V`Y`	&
DYfZcfa UbVW#Wta dcg]hcb Yl Ua]bU]cb`) \$)	Bch5dd`]W]V`Y`	%

5ggYgga Ybh8YHU]`g`

5ggYgga Ybh%`7 f]h]W]`f`Y`j`]Yk`U`b`X`f`Y`d`c`f`h`k`f`]h`b`[`

5`k f]hYb`Vf]YZk]`VY`[]j Yb`Zcf`hY`hUg_žcb`a ccX`Y`" `H\Y`gi ddcf]b[`XcW`a Ybhk]`VY`Xi Y`Uh%+\$`\$`cb`hY`
A cbXUmZc`ck]b[`h\Y`gWXYXi `YX`dfYgYb]h]cb"

Hi fb]h]b`gYh]b[. `H\]g`Ugg][ba Ybh]g`gi Va]hYX`h`fci [\ `Hi fb]h]b`UbX`ghi XYbhg`Xc`bchgYY`Hi fb]h]b`
g]a]Uf]mifYdcf]g"

5ggYgga Ybh' . `9bgYa V`Y`dUfh]hYgh]b[

GhUfhXUH. `Bch5dd`]WV`Y

8YhU]`g. `Gh XYbhgf]Wcb]f]Vi h]cb`h`YbgYa V`Y`fY\YUfgU`g`UbX`dYfZc`fa UbW`g`k]`VY`UggYggYX`Vm`h`Y`
YbgYa V`Y`X]fYW`cf`UbX`h`fci [\ `U`dUfh]WXYW_]b[`hYghUhi`h`Y`YbX`cZ`h`Y`gYgg]cb": YXVUW_`X]fYW`Xi f]b[
fY\YUfgU`g`UbX`Y`YW`fcb]WUZ]f`dUfh]WXYW_]b["

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

DUfh]WXYW_]b[`bcfa U`mi]U`Yg`d`UW`]b`k YY`_% žVi hd`YUgY`W`cbgi `h`mci f`YbgYa V`Y`X]fYW`cf`Zc`f`XYhU]`g`
gdYW]W`h`mci f`YbgYa V`Y`"

5ggYgga Ybh(. `DYfZc`fa UbW`#`W`ca dcg]h]cb`YI Ua]bU]cb

GhUfhXUH. `Bch5dd`]WV`Y

8YhU]`g. `&\$`a]bi hYg`dYfZc`fa UbW`YI Ua]bU]cb""7 ca dcg]h]cb`ghi XYbhg`k]`VY`fYeI]fYX`h`c`gi Va]hU`

Gi Va]gg]cb'cZ5ggYgga YbhHUg_g

Gh XYbng'UFY'YI dYWX'hc'di hH'Y'f'buA Yg'UbX'ghi XYbhibi 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]hbzd'YUgY
HY'd\cbY'9I HYfbU'Gi ddcf'hc'b-' ,) "' ' ' %cf'Ya U]'hYa 'cb'[YI HYfbU'HY'f'gi ddcf'f4 i bgk "YXi "Ui "](#)"Gi ddcf'h
\ci fg'UFY' , .\$\$Ua '-'%. \$\$da 'cb'k YY_XUmg'UbX'-. \$\$Ua '-') . \$\$da 'cb'k YY_YbXg'f'fl *) 'XUmg'U'mYUf'f'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 Ybng'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 'hca U]h'W'U'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'U'm'Ug'_Zcf'cb'Y"
Hi fb]hb'U'gc'd'fc]]XY'gi dXU'Y'g'cb'h'Y]f'gmg'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'U'm'j]U'Y]h'Y'f'Hi fb]hb'cf'U'A cc'X'Y
Ugg][ba Ybh'f'f']bg'h'Ub'W'g'k \Y'f'Y'h']g']g'bc'h'id'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'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'bh'cZXY'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'cbg]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'X
&(!\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'h'c'U'XY'Xi W]cb'c'Z
)i 'cZ'HY'hc'U'Uk U'f'X'U'V'Y'a U'f'_Z'ca 'h'Y'a U'f_'h'U'hk'ci 'X'\U'j Y'V'Y'Y'b'U'W'X'Yj YX']Z'b'c'h'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'c'Z(. \$\$da 'cb'%' 'A Um'&\$\$* 'Uh(. \$\$da 'cb'%' 'A Um'&\$\$*
k]'b'W'f'U'XY'Xi W]cb'c'Z%'\$i " "

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

Z'h'Y'f'Ug_]g'a U'f'_Y'X'ci hc'Z&) Z'h'Y'b'UH'gi Va]gg]cb'k]'U'h'f'U'W'h'U'd'Yb'U'm'c'Z'U'XY'Xi W]cb'c'Z%'&) Z'ca 'h'Y
a U'f_'Uk U'f'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]YX'Vi hU'a Uf_cZnYfc'k]''VY'fYWcfYX'Z'hY'k cf_k ci 'X'\Uj Y'fYW]j YX'U'dUgg'a Uf_Vi hZcf hY''UhYbYgg'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 "Ufng"i bgk "YXi "Ui #W ffYb\]h\]gh XYbh\]g#JW\]XYa \]W\]bZcfa Uh\]cb#\]fchcWc`g!\[i \]XY`\]bYg#](#)

5 WUXYa]W<c bYghmUbX`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 hW`YX]h`

hUddfcdf]UHY`dUfUd`fUg]b[.`7`Ub[]b[`U`ZYk `k cfXg`UbX`d`fUgYg`k \]Y`a cghmifYU]b]b[`hY`cf][]bU`
ghfi W`i 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 hW`YX]h`UbX`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]h]Yg'Ug'U'gh XYbhUhl BGK
- VY'Uk UfY'cZd'U[]Uf]ga ž'Wc'dmf][\hžI BGK 'Gh XYbh7cXY'cZ7cbXi WñUbX'5Ww'dhUV'Y'I gY'cZ I BGK '⇒H'F Ygci fW'g'Dc`]Wñ
- VY'Uk UfY'cZñY'ghUbXUfXg'cZVY\Uj]ci f'YI dYWñX'cZYj Yfmcby'jb'hY'I BGK 'Wca a i b]m
- `cWñh'gYfj]Wg'UbX'jbZcfa Uhcb'UVci hl BGK 'UbX'I BGK '@VfUfm

Gca Y'cZñYgY'UfYUg'k]`VY'ZJa]]Uf'hc'mci žcñYfg'k]`VY'byk "; U]b]b['U'gc`X'i bXYfghUbx]b['cZU`ñY fY'UH'X'UgdYWñ'cZ9@G9'k]`Y'd'mci 'a U_Y'hY'a cghcZmci f'gh X]Yg'Uhl BGK "

[f\hd.#gi.VYWfi\]XYg"\]VfUfmi bkg "YXi "Ui #\]gY#UVci h'lgYŁ](#)

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

H\Y`Wci fgY`hI h]g`K]`]Ua cbz5" fP`X"l" f&\$\$ (l"? ge[US^Wj UW*W UW efdSfW [Wè S` V fWUZ` [cgWè fa W ZS` UW
bWè d_ S` UWè CI ZcfX. CI ZcfX`I b]j Yfg]miDfYgg"

F YWca a YbXYX`F Ygci fWg

GY`@Y[Ubhc`fYUX]b[``]ghcb`a ccX`Y"

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

Hck UfXg`hY`YbX`cZgYa YghYf`ghi XYbtr`k]`VY`Ug_YX`hc`dUfh]WdUHy`]b`hY`a m9I dYf]YbW`gi fj Ym`

⇒ U[Y`7 fYX]h

6cX]Yg/` `bhYfZUW`g`&\$%*

7F ⇒ CG