



K]``\YUj mifU]bg`]b` < YbUb`WUi gY`h\Y`df]W`cZ`fUk
a UhYf]U`g`Zcf`W`hcb`XfYgg`ZUVf]Whc`g`mfcW`Yh

K]``\YUj mifU]bg`]b` < YbUb`WUi gY`h\Y`df]W`cZ`fUk `a UhYf]U`g`Zcf`W`hcb
XfYgg`ZUVf]Whc`g`mfcW`Yh3

⊕ ⊔ `mi&\$&%ž`U`Uf[Y!gWU`Y`\YUj mifU]bZU``]b` < YbUb`UZZYWhg`h\Y`\YUfhg`cZ
h\Y`dYcd`Y`UWfcgg`h\Y`W`i bhfm`5h`h\Y`gUa`Y`h]a`Yž`Ug`< YbUb`]g`U`a`U`cf
W`hcb`hYI`h]`Y`dfcj`]bW`]b`7\]bUž`k`h\Y`f`\YUj mifU]bg`k`]``\Uj`Y`U
g][`b]Z]WUbh]a`dUWh`cb`h\Y`hYI`h]`Y`]bXi`ghfm`\Ug`U`gc`UhhfUWHYX`a`i`W
UhhYbh]cb"

5W`c`fX]b[`hc`U`fYdcfhYf`Zfca`h\Y`7U`]Ub`BYk`g`5[YbWmž`h\Y`]bXi`ghfm`\Ug
`YUfbYX`h\Uh`h\Y`\YUj mifU]b`]b` < YbUb`W`ffYbh`m`\Ug`]a`]hYX`]a`dUWh`cb
h\Y`dfcXi`Wh]cb`cZ`a`U]b`fUk`a`UhYf]U`g`]b`h\Y`W`hcb`hYI`h]`Y`]bXi`ghfmž`Vi`h
`c[]gh]Wg`UbX`hfUbgdcfhUh]cb`UfY`UZZYWHYX`hc`U`W`fhU]b`YI`hYbh`5g`h\Y`fU]b
[fUXi`U`m`XYWfYUgYgž`gi`VgYei`Ybh`dfcXi`Wh]cb`UbX`hfUbgdcfhUh]cb`a`Um
[fUXi`U`m`fYhi`fb`hc`bcfa`U"

5W`c`fX]b[`hc`h\Y`]bZcfa`Uh]cb`cVhU]bYX`VmifYdcfhYfg`Zfca`h\Y`:]bUbW]U`
5ggcW]Uh]cbž`< YbUb`W`hcb`gd]bb]b[`gd]bX`Yg`UfY`a`U]b`m`W`bW`bhfUHYX`]b
?U]ZYb[ž`G`Ub[e]i`ž`B`Ub`m]b[ž`L]bi]Ub[ž`>Ucni`cž`UbX`D]b[X]b[g`Ub"
5a`cb[`h\Ya`ž`L]bmY`]b`B`Ub`m]b[`]g`U`ZJa`ci`g`W`hcb`hYI`h]`Y`W]hm]b`7\]bU"
⊕g`dfcXi`Whg`UfY`a`U]b`m`di`fY`W`hcb`mUfbgž`a`cgh`m]b`(\$`G`UbX`*`\$G
W`i`bhg`< YbUb`f`g`fUmc`b`mUfb`dfcXi`Wh]cb`YbhYfdf]gYg`UfY`W`bW`bhfUHYX`]b
L]bi]Ub[ž`UbX`h\Y]f`dfcXi`Whg`UfY`a`U]b`m`f]b[!gdi`b`fUmc`b`mUfb`UbX
ghfUbXg"

5`dYfgcb`]b`h\Y`W`hcb`]bXi`ghfm`hc`X`U`fYdcfhYf`Zfca`h\Y`:]bUbW]U`
5ggcW]Uh]cb`h\Uh`< YbUb`]g`cbY`cZ`h\Y`hcd`h\YfY`W`hcb`gd]bb]b[`VUgYg`]b
h\Y`W`i`bhfm`5h`dfYgYbž`a`cgh`cZ`h\Y`hYI`h]`Y`YbhYfdf]gYg`UfY
W`bW`bhfUHYX`]b`hck`bg`UbX`j`]U[Ygž`Vi`h`h\Y`c[]gh]Wg`cdYfUh]cb`]g`bch
UZZYWHYX`"G`][`h`mifYghf]WHYX"

5`fYdcfhYf`Zfca`h\Y`7U`]Ub`BYk`g`5[YbWm`U`gc`YUfbYX`Zfca`gca`Y



k YUj]b['ZUWhcf]Yg']b'N\ci _ci žN\i a UX]Ub'UbX'ch\Yf'd`UWg'h\Uh'h\Y
ZUWhcf]Yg'Wcbh]bi Y'hc'cdYfUH'UWwcfX]b['hc'cfXYfgž'UbX'h\Y
fYd`Yb]g\ a Ybh'h\Ug' bch'VYYb'UZZYWhYX'Zcf'h\Y'h]a Y'VY]b["

H\Y'XUH'g\ck g'h\Uh'h\YfY']g'bc'cVj]ci g'Zi Whi Uh]cb']b'h\Y'gdch
hfUbgUWh]cb'df]W'cZ'Wchhc'b'mUfb'hcXUmž'UbX'h\Y'cZZYf'df]W'cZ'7' &G']g
Ufci bX'&* ž\$\$\$\$'mi Ub#cb"

H\Y'UVcj Y!a Ybh]cbYX'dYcd'Y']b'h\Y'Wchhc'b']bXi ghfm'hc'X'fYdcfhYfg'Zfca
h\Y':]bUbW]U'5ggcW]Uh]cb'h\Uh'h\Y'Ua ci bh'cZ'Wchhc'b'd'UbhYX'UbX
dfcW'ggYX']b'<YbUb']g'fY'Uh]j Y'miga U'ž'UbX'hfUXY'UbX'ghcfU[Y'UfY
fY'Uh]j Y'm'WcbW'bfUH'YX'"H\Y'bi a VYf'cZ'Wchhc'b'd'Ubh]b['UbX'gd]bb]b[
YbhYfd]gYg']b'N\Yb[n\ci ž'k \]W\]g'a cgh'gYj YfY'm'UZZYWhYX'Vmh\Y
fU]bghcfa ž']g'bch'Uf[Y'"Gc'ZUfž'h\YfY'\Ug'VYYb'bc'ZccX]b['cf'XUa U[Y'hc
h\Y'cW'W'Wchhc'b'k UfY\ci gY'"Gi VgYei Ybh'ZccX'X]gW\Uf[Yž'c[]gh]Wg'UbX
hfUbgdcfhUh]cb'k]'\Uj Y'Ub']a dUWhž'Vi h'Ug'h\Y'k YUh\Yf']a dfcj Ygž'h\Y
]a dUWh'k]'bch'Ugh'cb["AcfYcj Yfž'h\Y'UWhi U'hfUbgUWh]cb']c'i a Y'cZ
Xca Ygh]W' midfcXi W'X'Wchhc'b']g'bch'Uf[Y'Uh'dfYgYbh'"8i Y'hc'h\Y
a U]bhYbUbW'UbX'\][\dcg]h]cb'cZ'h\Y'fUk 'a UhYf]U']bj Ybhcfm'cZ'h\Y
gd]bb]b['a]ž'h\Y'i f[Ybh'g\]da Ybh'j c'i a Y']g'U'gc']a]hYX"

5'ghUZZ'a Ya VYf'cZ'L]bi]Ub['7\Ya]WU'':]VYfž'U'YUX]b['gdUbXYI
YbhYfd]gYž'hc'X'U'fYdcfhYf'Zfca 'h\Y':]bUbW]U'5ggcW]Uh]cb.'K Y'\Uj Y
hU_Yb' [ccX'dfYWUi h]cbg']b'UXj UbW'"5h'dfYgYbhž'dfcXi Wh]cb']g'bcfa Už
UbX'hfUbgdcfhUh]cb'\Ug'bch'VYYb'g][b]Z]WUb'h'm'UZZYWhYX'"8i Y'hc'h\Y
ZcfYWUghž'h\YfY']g'gh]'fU]bž'UbX'h\Y'Zi hi fY']g'gh]'i bW'fhu]b'"

F 9: ß 9: 56F ⇒G']g'U'dfcZYgg]cbU'cbY!ghcd'Z]bY'Wchhc'b'ZUVf]Wg'gc'i h]cb
Zcf'UddUfY'ž'VYXX]b[ž'Wch\Ygž'H!g\]fhgž'UbX'ch\Yf'ZUg\]cb'Wch\]b[
a Ubi ZUWhi fYfg'"<Uj]b['VYYb'gi dd'm]b['U'_']bXg'cZ]bY'Wchhc'b'ZUVf]Wg
Zcf'cj Yf'%\$'mYUfgž'F 9: ß 9: 56F ⇒G'dfcj]XYg'\][\ei U']hmž'Xi fUV'Y'UbX
VYUi h]Zi 'Wchhc'b'ZUVf]Wg'Zfca 'FYZ]bY'ZUVf]Wg'"Z'mci '\Uj Y'Ub'm'b'Y'Xgž
k Y'Wca Y'hc'WcbhUWh'i g'j]U. [gU'Yg4 fYZ\]bYZUVf\]Wg'Wca](#)

H\Y']a dUWh'cZ\YUj m'fU]b'cb'h\Y']bXi ghfm'UbX'Wchhc'b'XfYgg'ZUVf]WfUK
a UhYf]U'df]W'g

HfUW_]b['XUH'Zfca 'h\Y'7\]bU'7chhc'b'HYI h]Y' ßXi ghfm'5ggcW]Uh]cb
f\YfY']bUZhYf'fYZYffYX'hc'Ug'h\Y'7\]bU'7chhc'b' ßXi ghfm'5ggcW]Uh]cbŁ



g\ck g'h\Uh:đ bY`&\$&%]g'h\Y`hfUX]h]cbU`cZl gYUgcb`cZ'h\Y`]bXi ghfmž
hYI h]Y`YbhYfd]gYg`Uj Y`UWWd hUV`Y`cfXYfgž`h\Y`a Uf_Yh`hfUbGUWh]cb
df]Wf`cZ`Wc`hcb`XfYgg`ZUVf]W]g`fY`Uh]j Y`mighfcb[ž`UbX`h\Y`cj YfU`
dYfZcfa UbWf`cZ`h\Y`mUfb`a Uf_Yh`]g`VYhhYf`h\Ub`h\Uh`cZ`[fYm`ZUVf]Wg`ž
H\Y`Vcch`fUhY`fYa U]bg`\][\`"

7ca dUFYX`k]h\`A Umž`]b`đ bYž`h\Y`di fW\UgY`UbX`Wc`bgi a dh]cb`cZ`fUk
a UhYf]U`g`Zc`f`Wc`hcb`XfYgg`ZUVf]Wc`Z`Wc`hcb`hYI h]Y`YbhYfd]gYg`]bWfYUgYXž
UbX`h\Y`]bj Ybhcfm`cZ`fUk`a UhYf]U`g`Zc`f`Wc`hcb`XfYgg`ZUVf]WXYWfYUgYX/
mUfb`dfcXi W]cb`UbX`gU`Yg`]bWfYUgYXž`UbX`]bj Ybhcf]Yg`XYWfYUgYX/[fYm
Wch`dfcXi W]cb`]bWfYUgYXž`gU`Yg`XYWfYUgYXž`UbX`]bj Ybhcf]Yg`]bWfYUgYX`"

H\Y`Wc`hcb`XfYgg`ZUVf]WfUk`a UhYf]U`dfcW`fYa Ybh`UbX`]bj Ybhcfm

đ`đ bYž`h\Y`di fW\UgY`cZ`fUk`a UhYf]U`g`Zc`f`hfUW_]b[`Wc`a`dUb]Yg`FfiWc`hcb
XfYgg`ZUVf]W]bWfYUgYX`Vm`("))`i`Zfca`h\Y`dfYj`]ci`g`a`cbh`ž`UbX`h\Y
di fW\UgY`cZ`fUk`Wc`hcb`]bWfYUgYX`Vm`+"\$,`i`Zfca`h\Y`dfYj`]ci`g`a`cbh`"
5a`cb[`h\Ya`ž`h\Y`di fW\UgY`cZ`]a`dcfhYX`Wc`hcb`XYWfYUgYX`Vm`("%)`i`
Zfca`h\Y`dfYj`]ci`g`a`cbh`/h\Y`di fW\UgY`cZ`bcb!Wc`hcb`Z]VYf`]bWfYUgYX
Vm`\$`*)`i`Zfca`h\Y`dfYj`]ci`g`a`cbh`"K`]h\`h\Y`gi`ddcfh`cZ`cfXYfgž`hYI h]Y
Wc`a`dUb]Yg`↑`gh`bYYX`hc`ghc`W`_`a`cfY`"

:`fca`h\Y`dYfgdYWh]j`Y`cZ`Wc`hcb`XfYgg`ZUVf]WfUk`a UhYf]U`df]Wf`gž
Xca`Ygh]W`Wc`hcb`df]Wf`g`Zi`Whi`UhYX`k`]XY`m`]b`đ bY`"H\Y`[`cj`Yfba`Ybh
fYdYUhYX`m`fYa`]bXYX`h\Y`f]g`_`cZ`YI`Wf`gg]j`Y`m`fUd]X`f]gY`]b`Wc`a`a`cX]hm
df]Wf`gž`UbX`]bhcfXi`Wf`X`U`bi`a`VYf`cZ`a`YUgi`fYg`hc`Ybgi`fY`gi`dd`m`UbX
ghUV`]nY`df]Wf`g`7`chcb`df]Wf`g`ghc`ddYX`f]g]b[`UbX`ghUV`]nYXž`k` \]Y`bcb!
Wc`hcb`Z]VYf`df]Wf`g`fcgY`g`][`h`m`"``C`b`đ bY`" \$ž`h\Y`a`U]b`Wc`bhfUWh`cZ
N\Yb[`7`chcb`:`i`hi`fYg`k`Ug`%`ž`\$`\$`mi`Ub`#`cbž`Ub`]bWfYUgY`cZ`),`)
mi`Ub`#`cb`Zfca`h\Y`dfYj`]ci`g`a`cbh`/7` \]bU`g`Xca`Ygh]WghUbXUfX`Wc`hcb
df]Wf`k`Ug`%`ž`(*`\$`mi`Ub`#`cbž`Ub`]bWfYUgY`cZ`(+)`mi`Ub`#`cb`Zfca`h\Y
dfYj`]ci`g`a`cbh`/h\Y`]bhYfbUh]cbU`Wc`hcb`df]Wf`5`]bXYI`k`Ug`-`*`+
Wf`bhg`#`V`ž`5`a`cbh`!cb!a`cbh`]bWfYUgY`cZ`+"\$`Wf`bhg`#`V`ž`X]gWc`i`bhYX`Vm`U
%a`hUf]ZZ`df]Wf`cZ`)`ž`*`&`mi`Ub`#`cbž`h\Y`df]Wf`X]ZZYfYbWf`VYhk`YYb
]bhYfbU`UbX`YI`hYfbU`Wc`hcb`]g`%ž`\$`-,`mi`Ub`#`cbž`UbX`h\Y`df]Wf`X]ZZYfYbWf`
]g`fYXi`Wf`X`Vm`UVci`h)`&+`mi`Ub`#`cb`Zfca`h\Y`dfYj`]ci`g`a`cbh`"đ`hYfa`g`cZ
bcb!Wc`hcb`Z]VYfgž`h\Y`df]Wf`cZj`]gWc`gY`ghUd`Y`Z]VYf`k`Ug`VUg]WU`m`ighUV`Y
]b`đ bY`"C`b`đ bY`" \$ž`h\Y`df]Wf`k`Ug`%&+`%\$`mi`Ub`#`cbž`Ub`]bWfYUgY`cZ`%`%\$
mi`Ub`#`cb`Zfca`h\Y`dfYj`]ci`g`a`cbh`/dc`mYghYf`ghUd`Y`Z]VYf`fcgY`g`][`h`mž`"



UbX`h\Y`df]W`k Ug`+\$\$`mi Ub#hcb`cb`đ bY`" \$`"H\Y`a cbh\!cb!a cbh\`
]bWfYUgY`k Ug`&*)`mi Ub#hcb`"

H\Y`W`hcb`XfYgg`ZUVf]WfUk`a UhYf]U`W`bgi a dh]cb`UbX`]bj Ybhc fm

HfUW_]b[`XUhU`g\ck g`h\ Uh`h\Y`W`bgi a dh]cb`cZfUk`a UhYf]U`g`Zcf`h\Y`
W`hcb`XfYgg`ZUVf]WcZ`W`hcb`hYI`h]`Y`YbhYfdf]gYg`]bWfYUgYX`Vm`&," (i`
a cbh\!cb!a cbh\ž`cZk` \]W`fUk`W`hcb`W`bgi a dh]cb`]bWfYUgYX`Vm`&"+*i`
a cbh\!cb!a cbh\ž`UbX`bcb!W`hcb`Z]VYf`W`bgi a dh]cb`]bWfYUgYX`Vm`
&"- -i`a cbh\!cb!a cbh\`5g`cZ`h\Y`YbX`cZ`đ bYž`fUk`a UhYf]U`]bj Ybhc fm
ZY``(" (i`a cbh\!cb!a cbh\`UbX`]bWfYUgYX`%&"% i`mYUf!cb!mYUf`
5a cb[`h\Ya`ž`fUk`W`hcb`]bj Ybhc fm`XYWfYUgYX`Vm`) "&(i`a cbh\!cb!
a cbh\`UbX`%&"* (i`mYUf!cb!mYUf`/bcb!W`hcb`Z]VYf`]bj Ybhc fm`XYWfYUgYX`
Vm`&"* &i`a cbh\!cb!a cbh\`UbX`]bWfYUgYX`Vm`%\$"- -i`mYUf!cb!mYUf`"

H\Y`W`hcb`XfYgg`ZUVf]WdfcXi`W]cb`ghUhi`g

HfUW_]b[`XUhU`g\ck g`h\ Uh`]b`h\Y`Z]fgh`UbX`gYW`bX`ei`UfhYfgž`h\Y`ci`hdi`h`cZ`
W`hcb`hYI`h]`Y`YbhYfdf]gYgPfiW`hcb`XfYgg`ZUVf]W]bWfYUgYX`Vm`\$`&%i`UbX`
+"(+i`fYgdYWhj`Y`m`Zfca`h\Y`dfYj`]ci`g`ei`UfhYfž`UbX`Vm`&\$`%&i`UbX`
-") &i`fYgdYWhj`Y`m`mYUf!cb!mYUf`"đ`đ`bYž`h\Y`cfXYf`cZ`hYI`h]`Y`
YbhYfdf]gYgPfiW`hcb`XfYgg`ZUVf]Wk`Ug`UW`W`dhUV`Yž`UbX`gca`Y`
YbhYfdf]gYgPficfXYfg`k`YfY`gW`YXi``YX`hc`GYdhYa`VYfž`UbX`h\Y`Yei`]da`Ybh`
i`h]`nUh]cb`fUhY`fYa`U]bYX`Uh`U`fY`Uh]j`Y`m`\][`\\`Yj`Y`"

H\Y`W`hcb`XfYgg`ZUVf]WgU`Yg`UbX`]bj Ybhc fm

HfUW_]b[`XUhU`g\ck g`h\ Uh`h\Y`gU`Yg`j`c`i`a`Y`cZ`W`hcb`XfYgg`ZUVf]W]b`
A`Um`]bWfYUgYX`Vm`("()i`a cbh\!cb!a cbh\ž`UbX`h\Y`gU`Yg`j`c`i`a`Y`cZ`
W`hcb`XfYgg`ZUVf]W]b`đ`bY`XYWfYUgYX`Vm`%(" (i`a cbh\!cb!a cbh\`"H\Y`
cj`YfU``dYfZcfa`UbW`cZ`h\Y`W`hcb`XfYgg`ZUVf]Wa`Uf`_Yh`]g`fY`Uh]j`Y`m`
[`ccXž`h\Y`]bj Ybhc fm]g`ck`ž`h\Y`di`fW`UgY`UbX`gU`Yg`cZ`h\Y`[`fYm`W`ch`
a`Uf`_Yh`\Uj`Y`k`YU`_YbYXž`UbX`h\Y`]bj Ybhc fm`\Ug`f]gYb`"

đ`hYfa`g`cZ`df]W`gž`W`hcb`df]W`g`\Uj`Y`f]gYbž`W`hcb`XfYgg`ZUVf]Wdf]W`g`
\Uj`Y`VUg]WU``m`fYa`U]bYX`ghUV`Yž`UbX`h\Y`dfcZ]h`a`Uf[`]bg`cZ`W`hcb`hYI`h]`Y`
YbhYfdf]gYg`\Uj`Y`bUffck`YX`"Cb`đ`bY`" \$ž`h\Y`df]W`cZ`&`di`fY`W`hcb`
WUfYX`mUfb`]bWfYUgYX`Vm`&\$`mi`Ub#hcb`Zfca`h\Y`dfYj`]ci`g`a`cbh\ž`h\Y`
df]W`cZ`\$`di`fY`j`]gW`gY`mUfb`ZY``Vm`%ž`\$`\$`mi`Ub#hcb`Zfca`h\Y`dfYj`]ci`g`



a cbh\ž'UbX'h\Y'df]W'cZ' &di fY'dc`mYghYf'mUfb']bWfYUgYX'Vm%+\$
mi Ub#hcb'Zfca'h\Y'dfYj]ci g'a cbh\"H\Y'df]W'cZ[fYm'ZUVf]Wg'ZY`"C b
š bY' '\$ž'h\Y'Wchcb'[fYm'ZUVf]W' &t' &'%' \$t+\$'&#%'(+`'hk]'`k Ug')"- +
mi Ub#a YhYfž'Xck b'\$"\$' 'mi Ub#a YhYf'Zfca'h\Y'dfYj]ci g'a cbh\"

÷`hYfa g'cZ']bj Ybhcfmž'Ug'cZ'h\Y'YbX'cZ'š bYž'mUfb']bj Ybhcfm'XYWfYUgYX
Vm'\$") &i 'a cbh!cb!a cbh\ž'UbX'Wch\']bj Ybhcfm]bWfYUgYX'Vm' "&*ı
a cbh!cb!a cbh\" ÷`š bYž'h\Y'mUfb'a Uf_Yh'k Ug'di fW\UgYX'UbX'gc`X
ga cch\`m'H\Y'gU`Yg'j c'i a Y'cZ'Wcbj Ybh]cbU`'j Uf]Yh]Yg']b'h\Y'[fYm'Wch\`
a Uf_Yh'k Ug`ck Yf'h\Ub'h\Uh]b'h\Y'dfYj]ci g'dYf]cXž'UbX'h\Y']bj Ybhcfm
\UX'UWWW a i `UhYX"5g'U'k \c`Yž'h\Y'Wca dUbmFg'mUfb'UbX'Wch\']bj Ybhcfm
k Ug'Wcbhfc`YX'k]h\]b'cbY'a cbh\"

H\Y'Wchcb'XfYgg'ZUVf]Wgi dd`Yf

F 9: ÷ 9: 56F ÷ 7G]g'U'dfcZYgg]cbU`cbY!ghcd'Z]bY'Wchcb'ZUVf]Wg'gc'i h]cb
Zcf'UddUfY`ž'VYXX]b[ž'Wch\Ygž'H!g\]fhgž'UbX'ch\Yf'ZUg\]cb'Wch\]b[
a Ubi ZUWhi fYfg" <Uj]b[`VYYb'gi dd`m]b['U`_]bXg'cZ]bY'Wchcb'ZUVf]Wg
Zcf'cj Yf%'\$'mYUfgž'F 9: ÷ 9: 56F ÷ 7G'dfcj]XYg'\][\`ei U]hmž'Xi fUV`Y'UbX
VYUi h]ž' `Wchcb'ZUVf]Wg'Zfca' FYZ]bY'ZUVf]Wg" ÷`mci `Uj Y'UbmibYYXgž
k Y'Wca Y'hc'WcbhUWh'i g'j]U. [gU`Yg4 fY\]bY ZUVf\]Wg`Wca](#)