



7ci fgY`Cj Yfj]Yk

`GHUZZ7cbhUW`i8YHUJ`g`

`7cbj Ybcfg`

B Ua Y	9a U]`	5j U]`UV]`]m	@cW]hcb	D\cbY
<i [i Yg`DYHfg	\`dYHfg4 i bgk "YXi "Ui	: f]XUm%&!&da	A cfj Yb`6fck b &+)	\$&`-' ,) %((\$

`@YW`i fYfg`

B Ua Y	9a U]`	5j U]`UV]`]m	@cW]hcb	D\cbY
<i [i Yg`DYHfg	\`dYHfg4 i bgk "YXi "Ui	: f]XUm%&!&da	A cfj Yb`6fck b &+)	\$&`-' ,) %((\$

`Hi hcfg`

B Ua Y	9a U]`	5j U]`UV]`]m	@cW]hcb	D\cbY
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GWXcc`7cbhUW`i`bZcfa Uhjcb

GWXcc`cZ<i a Ub]hYg`UbX`@Ub[i U[Yg

@cW]hcb. GWXcc`C Z]WZ`A cfj Yb`6fck b`6i]X]b[ž`@Yj Y`&ž&),

C dYb]b[`<ci fg. A cbXUm! : f]XUmž`- Ua `!`) da

D\cbY. Ž`*%&`-' ,) `* , %

: U! . Ž`*%&`-' ,) ; , +\$)

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

7ci fgY'8YHJ]`g

7fYX]hDc]bHg`*`

Gi a a UfmicZ\hY'7ci fgY

Gi VYWh5fYU.: fYbVW`Gh X]Yg

H\]g`Wci fgYžYbh]fY`mHUi [\h]b: fYbVWž[]j Yg'mci`hY`cddcfh b]mhc`ja a YfgY'mci fgY'Z]b`hY: fYbVW`Ub[i U[Y`]b`cfXYf`hc`XYj Y`cd'mci f`cfU`Zi YbWmUbX'mci f`]b[i]gh]WUk UfYbYgg`Ug`k Y`Ug'mci f`_bck`YX[Y cZWcbhYa dcfUfm: fYbVW`W`h`fY"

Mci`k`]`YUfb`hY`]b[i]gh]WVUg]g`Zcf`hY`XYgW]dh]cb`cZgdc_Yb: fYbVW`UbX`k`]`ZJa`]Uf]nY'mci fgY`Zk`]h`hY`ZYUhi fYg`cZghUbXUfX`UbX`bcb!ghUbXUfX`gdYYW`j Uf]Yh]Yg`ffY[]cbU`: fYbVWž: fYbVW`ci hg]XY: fUbWž`j YfbUW`Uf`Ub[i U[Y`cZ\hY'mci h`E`UbX`hY`[Ygh`fYg`i`gYX`]b`cfU`Wca a i b]WU]cbž`Ug`k Y`Ug`UVci h`hY

gci bXgžZJWU`YI dfYgg]cbg`UbX`UbX`[Yghi fYgžU`cZk`\\WX`dUfh]dUH`]b`h`Y`WfYUhc`cZa`YUbj["H\Y
V`i fgY`U]a`g`UhXYa`cbghfUhb[`ck`h`]g`cVWV`fg`]b`gdc`_Yb` : fYbVX`UbX`fU`_Yg`]bhc`UWV`i bh`h`Y`j`Uf]Yh`Yg`cZ
: fYbVX`h`UhgdYU`_Yfg`fYU`mi`gY`fY`["`V`cei`]U` : fYbVX`ž`fY`[]cbU` : fYbVX`ž`Ub[i U[Y`cZ`h`Y`mci`h`ž` : fYbVX`
ci`hg]XY` : fUbVW`E`G`h`XYb`hg`k`]`Udd`m`h`Y`h`Y`c`f`m`h`c`j`Uf]ci`g`WUgg`YI`Y`f`W]g`Yg`U]a`]b[`Uh`h`Y`]a`dfcj`Ya`YbhcZ
dfcbi`bW]Uhc`b`UbX`c`fU`Zi`Yb`W`ž`UbX`Uh`h`Y`XYj`Y`cda`YbhcZ`V`bj`YfgUhc`b`UbX`dfYg`Yb`fUhc`b`g`_`]`g`"H\Ymk`]`
U`gc`Udd`m`h`Y`]f`_`bck`YX[Y`h`c`h`Y`Ub`U`mg]g`cZgY[a`Yb`hg`cZ]b`h`fj`]Yk`g`UbX`Z]a`g`fYdfYg`Yb`fUhc`b`Y`cZ`h`Y`
d`Y`bca`Yb`U`i`bXY`f`gh`Xm`F`YUX]b[`UbX`k`f]h`b[`g`_`]`g`k`]`U`gc`VY`YI`h`b`XYX`h`fci`[`h`h`Y`gh`XmcZ`fY`Yj`Ubh
h`I`hg`]b`]b[i`]gh]Wg`UbX`UggcW]U`h`X`X]gW]d`]b`Yg`"H\]g`V`i`fgY`k`]`dfcj`]XY`gh`XYb`hg`k`]h`h`Y`h`c`g`UbX
a`Y`h`c`Xg`h`c`[U]b`U`VY`h`f`i`bXY`f`gh`UbX]b[`UbX`i`gY`cZ`h`Y` : fYbVX`Ub[i U[Y`]b`j`Uf]ci`g`gc`W]U`V`c`b`h`I`hg`]5g
gi`VX`ž`h]g`U[ccX`V`a`dUb]cb`cZ`h`Y`]b[i`]gh]Wg`Y`Y`W]j`Y`UbX`V`c`b`h`I`h`U`V`i`fgY`g`cZ`h`Y` : fYbVX`dfc[fUa`"

HYUWX]b[`G`f`U`h`Y`[]Yg.

H\Y`V`i`fgY`]bj`c`j`Yg`ZJWV!h`!ZJWV`h`Y`UWX]b[`]b`h`Y`Z`c`f`a`c`Z`Y`W`h`fYg`UbX`U`g`Ya`]b`Uf`#i`h`c`f]U`" : UWV!h`!ZJWV`
h`Y`UWX]b[`]g`gi`ddc`f`h`X`UbX`Yb`\\Ub`W`X`V`m`h`Y`c`b`]b`Y`V`a`dcb`YbhcZ`h`]g`V`i`fgY`f`b`UW`V`c`U`f`X`h`fci`[`h`9`@`H`
I`B`G`K` ;`U`h`k`U`m`"H\Y`Ub[i U[Y`cZ]b`gh`f`W]cb`ž`Ugg`Y`gga`Yb`h`UbX`[Yb`Y`fU`V`a`a`i`b]W]Uhc`b`]g` : fYbVX`"

H\Y`Y`W`h`fY`k`]`VY`XYj`ch`X`h`c`h`Y`dfYg`Yb`fUhc`b`cZ`U`h`Y`c`f`Y`h`W]`XY`g`W]d`h`c`b`cZ`gdc`_Yb` : fYbVX`ž`Z`c`f`
YI`Ua`d`Y`ž`h`Y`XY`g`W]d`h`c`b`cZ` : fYbVX`j`ck`Y`g`UbX`V`c`bg`cb`Ub`hg`"`h`h`Y`g`Ya`]b`Uf`#i`h`c`f]U`g`h`Y`b`Yk`V`c`b`W`d`hg`
UbX`h`c`d]W`g`k`]`VY`XYa`cbghfU`h`X`k`]h`i`gY`cZa`i`h`ja`YX]U`gi`ddc`f`hg`ž`UbX`gh`XYb`hg`k`]`d`Y`f`Z`c`f`a`j`Uf]ci`g`
fY`Z`Y`W]j`Y`h`Ug`_`g`UbX`d`f`U`W]U`YI`Y`f`W]g`Yg`"H\Y`g`Y`]b`W`i`XY`U`V`c`f`U`h`c`f`m`YI`Y`f`W]g`Yg`Z`c`f`h`Y`]a`dfcj`Ya`YbhcZ`
dfcbi`bW]Uhc`b`UbX`]b`h`c`b`Uhc`b`ž`]gh`Y`b]b[`UbX`h`f`U`bg`W]d`h`c`b`h`Ug`_`g`ž`f`c`Y`d`U`m`ž`ga`U`[`fci`d`X]g`W`gg]cb`"

G`h`i`XYb`hg`k`]`VY`YI`d`Y`W`Y`X`h`c`\\Uj`Y`X`cb`Y`]b`k`f]h`b[`h`Y`dfYd`U`f`Uhc`b`f`Y`e`i`]fYX`Z`c`f`Y`U`W`Y`W`h`fY`UbX`
g`Ya`]b`Uf`#i`h`c`f]U`UbX`h`c`_`Y`Y`d`h`Ya`c`f[Ub]n`Y`X`]b`U`Y`U`f`b]b[`d`c`f`h`Z`c`ž`]b`c`f`X`Y`f`h`VY`V`a`Y`U`W]j`Y`m`Y`b[U[YX`
UbX`fY`g`d`c`b`g]V`Y`Z`c`f`h`Y`f`c`k`b`Y`U`f`b]b["7`Ugg`d`U`f`h`W]d`Uhc`b`UbX`k`f]h`Y`b`dfYd`U`f`Uhc`b`g`U`f`Y`g`g`Y`b`h]U`h`c`
dfc[fY`gg`]b`h`]g`V`i`fgY`ž`UbX`h`Y`Y`W`h`fY`f`k`]`Y`b`XY`Uj`ci`f`]b`V`c`b`b`Y`W]j`b[`h`]g`b`Yk`Y`U`f`b]b[`k`]h`h`Y`
gh`XYb`hg`ž`3`d`f`Y`]ci`g`_`bck`YX[Y`cZ`h`Y` : fYbVX`Ub[i U[Y`"

5 hYbXUbW F Yei]fYa Ybhg

5 hYbXUbW cZ@YW fYg#Hi hcf]U'g']g'a UbXUhfmi]b'h]g'W'e i fgY" i bYI W gYX'UVgYbW' Z'ca 'a cfY'h'Ub'&\$i cZ@YW fYg#Hi hcf]U'g'k]'fYgi 'h]b'h'Y'Uk UfX'U'ZJ]' [fUXY"

h'YW fYg'UbX'hi hcf]U'g'mei 'k]'UW]j Y'mYb[U[Y'k]h' W'e fY'W'e i fgY'W'e b'h'bh'z'YbUV']b['mci 'hc'U'fU]b'7 @C '% UbX'7 @C " "

7 ci fgY'GVX YXi `Y

[J \]yk' WUgg'h'a YhUVY](#)

H]a YhUV`Y`

8 UH	HmdY	7 cbhYbh
K YY_% '% : YVfi Ufm! '& : YVfi Ufm	@YW fY	@b[i]gh]Vg'cZgdYYW
	Hi hcf]U'	: 'i YbWm]b'gdYYW
K YY_&.&) : YVfi Ufm! ' A UfW	@YW fY	D\cbYh]Vg'cZ: fYbW
	Hi hcf]U'	: 'i YbWm]b'a cbc'c[i Y
K YY_" .'('A UfW '! '%\$ A UfW	@YW fY	D\cbYh]Vg'cZ: fYbW
	Hi hcf]U'	8]gW gg]cb'cZDFYdUfU]cb'%'fgYY'XYU]g'cb'A ccX'Y
K YY_(: '%A UfW '! '%+ A UfW	@YW fY	7 cbj YfgU]h'cb'UbU'mg]g
	Hi hcf]U'	: 'i YbWm]b'X]U'c[i Y
	5ggYgga Ybh	h!WUgg'HYghf&\$i ı ı
K YY_) .:'% 'A UfW '! '& A UfW	@YW fY	F YdfYgYb]h]cb'cZgdYYW. 'h'Y'Ub[i U[Y'cZ'h'Y h'YU'fY'
	Hi hcf]U'	8]gW gg]cb'cZDFYdUfU]cb'&
K YY_* .:&) 'A UfW '! " % A UfW	@YW fY	GcW'c]b[i]gh]Vg'cZ: fYbW
	Hi hcf]U'	: 'i YbWm]b']gh]Yb]b['W'a dFY\Ybg]cb"
	5ggYgga Ybh	C fU'X]gW gg]cb'f&) ı ı
K YY_+ .:'%5df]'!' + '5df]'	@YW fY	J Uf]Yh]Yg'cZgdc_Yb': fYbW
	Hi hcf]U'	8]gW gg]cb'cZDFYdUfU]cb'"
K YY_ , ; '5df]'!'%('5df]'	@YW fY	Gmb]U' 'cZgdc_Yb': fYbW
	Hi hcf]U'	8]gW gg]cb'cZW'bj YfgU]h'cbU'UbU'mg]g
	5ggYgga Ybh	5bU'mg]g'cZU'W'bj YfgU]h'cb'fl) ı ı Xi Y'cb'A ccX'Y"
K YY_- .:'% '5df]'!'&% 5df]'	@YW fY	F YdfYgYb]h]cb'cZgdYYW. 'h'Y'Ub[i U[Y'cZW'a]Vg'
	Hi hcf]U'	8]gW gg]cb'cZDFYdUfU]cb'('
K YY_ '\$.&&'5df]'!'& , 5df]'	@YW fY	BC '@97 HI F 9 '-F 958-B; 'K 99?
	Hi hcf]U'	BC 'HI HCF -5@-F 958-B; 'K 99?
	5ggYgga Ybh	YDc'f'z'c'f&\$i ı ı Xi Y'cb'A ccX'Y'

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

H\YfY`]g`bc`dfYgWf]VYX`hI hcc_`zcf`h`]g`Wci fgY" `A Uhf]U`g`k]`VY`dfcj]XYX`Vmh\Y`YW`fYf`UbX`a UXY

Cb:ñY"Ub[i U[Y'cZWta]Wcc_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Hi fb]hb`Gi Va]gg]cb

≠mci`YbWci bhYf`U`dfcV`Ya`k` \Yb`U`H`Ya` dh]b[`hc`gi Va]hmc`i`f`Ugg][ba YbhHfci [\`Hi fb]hb`z`d`YUgY
H`Y`d`l`cb`Y`9I`H`f`b`U`Gi` ddcfhcb`-`'` ,`)` " ` ' ` ' ` %cf`Ya` U]`H`Ya` `cb`YI`H`f`b`U`H`f`gi` ddcfh4` i` bgk` "YXi` "Ui` "Gi` ddcfh
`ci` fg`UfY` ,` .` \$\$Ua` -`-%\$.` \$\$da` `cb`k` YY`_`XUmg`U`b`X`-` .` \$\$Ua` -`)` .` \$\$da` `cb`k` YY`_`YbXg`f`l` *)` `XUmg`U`m`Y`U`f`l`" `≠mci
UfY`i` bUV`Y`hc`gi Va]hmc`i`f`Ugg][ba YbhXi`Y`hc`U`ZU`i`h`k`]H`Hi`fb]hb`mci`a` UmiUdd`mi`Zc`f`Ub`YI`H`f`bg]cb`z`Vi` hmc`i
a`i` gh`f`Y`H]b`mci`f`h]W`Y`h`bi`a` VYf`Z`ca` `9I`H`f`b`U`Gi` ddcfhf`U`cb[`k`]H`U`b`m`c`H`Y`f`f`Y`j` UbhXcW`a` Yb`hg`L`hc
]b`Wi` XY`Ug`Y`j`]XYbW`hc`gi` ddcfhmc`i`f`YI`H`f`bg]cb`Udd`]W`h]cb" `≠mci`Ya`U]`9I`H`f`b`U`Gi` ddcfhmc`i`k`]`
Ui`hc`a` Uh]W`U`m`f`Y`W`]j` Y`U`h]W`Y`h`bi`a` VYf`z`Vi`h]Z`mci`H`Y`d`l`cb`Y`mci`k`]`b`YYX`hc`gd`Y`W`Z]W`U`m`Ug`_`Zc`f`cb`Y"
Hi`fb]hb`U`gc`d`fcj`]XYg`i` dXU`H`g`i`cb`H`Y]f`g`m`g`H`Ya` `g`H`h`g`c`b`Hk`]H`Y`f`"

; YbYfU`m`z`UggYgga YbhHUg_g`a`i` gh`V`Y`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`H`b`]bg`H`U`b`W`g`k` \Y`f`Y`H`L`g`]g`b`ch`id`c`gg]V`Y`z`]h`k`]`V`Y`g`H`Y`X`i`cb`mci`f`W`ci`fg`Y`g`A`cc`X`Y`g`]H`k`]H`
U`H`f`b`U`h]j`Y`gi Va]gg]cb`XY`H]`g"

: cf`]b`Z`c`fa` Uh]cb`cb` \ck`hc`gi Va]hUgg][ba Ybh`g`cb`]b`Y`j`]U`A`cc`X`Y` .` \`h`td`g` .`#`g`h` XYb`H`i` bgk` "YXi` "Ui` #ack`!
gi Va]hUgg][ba Ybh`a`cc`X`Y`

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 gž`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[YgžUfhUbX`XYg][b`dfc`YWgžUg`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 cghmifYU]b]b[`hY`cf][]bU`
ghfi W`fY`UbX`#`f`dfc[fYgg]cb`cZ]XYUg`cZ`hY`cf][]bU`ž`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`Yž`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
]bWi XYg`dfcj]X]b[`mci f`k cf_]hc`UbchYf`gh`XYbhVYZc`fY`hY`Xi Y`XUHYž`cf`Zc`f`hY`di fdcgY`cZ`hY`a

- 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][\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 Yfmcby']b'h'Y'I BGK 'W'a a i b]m
- 'cW'W'h'gYfj]W'g'UbX']bZ'fa U]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'Y'X'UgdY'W'g'cZ9@-G9'k]''\Y'd'mci 'a U_Y'h'Y'a cghcZmci f'gh X]Yg'Uhl BGK ""

[\h'hd.##ji V'Y'W'i \]X'Yg" \]VfUfm'i bgk "YXi "Ui #' \]gY#\]Vci h' \]gY](#)

5 WUXYa]W]bZcfa Uh]cb`

: cf`YggYbh]U`ghi XYbh]bZcfa Uh]cb`fY`Uh]b[`hc.

- fYei Yghg`ZcfYI hYbg]cb/
- `UhY`gi Va]gg]cbg`[i]XY`]bYg/
- fYj]Yk `cZa Uf_g/
- I B GK `<YU`h`UbX`GUZY`midc`]WYg/
- YI Ua]bUh]cb`dfcVWXi fYg/
- gdYW]U`Vc]bg]XYfUh]cb`]b`hY`Yj Ybhcz]`bYgg`cf`a]gUXj Ybh fY/
- ghi XYbhYei]hmUbX`X]gUV`]`]m/
- UbX`chYf`YggYbh]U`UWUXYa]W]bZcfa Uh]cbz`gYY

[\hhdg.#k k k "Ufng"i bgk "YXi "Ui #W ffYbhghi XYbh\]bZcfa Uh\]cb`dfc\]Vc`g!\[i \]XY`\]bYg#](#)

⇒ U[Y`7 fYX]h

GmbYf[]Yg`]b`Gci bX`&\$%*`

7F ⇒ CG

7F ⇒ CG`Dfcj]XYf`7cXY.`\$\$\$- , ;