



ARTS3097

7 i ffYbh8 YVUHg]b `A YX]U`UbX`7 i `h fy

HYfa `C bY` `#`&\$%-



GWcc`cZH Y`5ftg`UbX`A YX]U` `#` I BGK `..5ftg`UbX`GcWU`GwYbWg

7ci fgY`Cj Yfj JYk

UbX]b`h` hcf]U`g`k]`VY`W ffYbhUbX`hcd]WJ`-`f]j Y`-`i`g]b[`hY`h`W`bc`c[]Yg`Uj`U]UV`Y`]b`Y`W`h`fY`UbX`h`hcf]U`
gdUW`g`z`k`\\]W`k`j``U`ck`gh`XYbhg`h`fYZYW`h`cb`UbX`XYj`Y`cd`Ub`]b`h`Y`W`h`U`Yb[U[Ya`Ybhk`]h`Vc`h`h`Y]f`

5ggYgga Ybh

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K Y][\h	8i Y'8UH	Gh XYbh@YUfb]b[Ci hWca Yg'5ggYggYX
G\cfr9ggUmi	')	%* # \$ ' # & \$ % - ' % % \$ \$ ' DA	%ž&ž
7`Ugg`dfYgYbhHU]cb`	%	Bch5dd`]WUV`Y	%ž&ž ž(
7 UgY`ghi Xm) \$	&+ # \$ (# & \$ % - ' % % \$ \$ ' DA	%ž&ž

5ggYgga Ybh8YHU]`g

5ggYgga Ybh%`G\cfr9ggUm

GHUfhXUH. `Bch5dd`]WUV`Y

8YHU]`g. `Gh XYbfr`k]`gi Va]hU`%\$\$\$`k c f X`fYZYW]j Y`d]YVW`cb`U`hcd]WdYfU]b]b[`hc`a`YX]U`hVWbc`c[]Yg`]b`h`Y`df]`U`h`Xca`U]b`"5`a`Uf_]b[`g\YYhk]h`k`f]hYb`Wca`a`Ybfr`UbX`a`Uf_`k]`VY`dfcj]YX`j]U`Hi`fb]h]b`"

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

5ggYgga Ybh&.`7`Ugg`dfYgYbhHU]cb

GHUfhXUH. `K`YY_`-`h`hcf]U`g

8YHU]`g. `Gh XYbfr`k]`a`U`Y`]bX]j]Xi`U`dfYgYbhHU]cbg`cZUVci`h)!+`a`]bi`hYg`YUW`cb`h`Y]f`hcd]WZcf`h`Y`7`UgY`Gh`Xm`H\]g`k]`c`WV`f`]b`U`h`hcf]U`WUgg`U`hY`f`]b`h`Y`g`Ya`Yg`hY`f`H\]g`hUg_]`g`WcgY`migWUZZc`XYX`hc`h`Y`7`UgY`Gh`Xm`UbX`YbWci`fU[]g`ghi`XYbfr`hc`di`hZcfk`UfX`Ub`Uf[]a`Ybh]b`j`YfVU`Zcfa`"5`a`Uf_]b[`g\YYhk]h`k`f]hYb`Wca`a`Ybfr`UbX`a`Uf_`k]`VY`dfcj]YX`"

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

5ggYgga Ybh' .`7`UgY`ghi`Xm

GHUfhXUH. `Bch5dd`]WUV`Y

8YHU]`g. `Gh XYbfr`k]`gi`Va]hU`&\$\$\$`k c f X`YggUmcb`U`hcd]WdYfU]b]b[`hc`h`Y`a`YX]U`hVWbc`c[]Yg`]b`h`Y`di`V`]WXca`U]b`"H\]g`]g`h`Y`Z]bU`UggYgga`YbhHUg_`"9UW`Ugg][`ba`Ybhk]`VY`[]j`Yb`U`bi`a`Yf]WU`a`Uf_`UbX`U`[`fUXY`"

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

5 HbXUbW F Yei]fYa Ybhg

Gh XYbhg UfY YI dYWX hc UHbX U YWf fYgZ UbX h hf]U'g UfY Wca di `gcfm' Gh XYbhg UfY fYei]fYX hc UHbX U'a]b]a i a `cZ, \$i `cZU` hY h hf]U'g" H\]g fYei]fYa Ybh]g fY UHbX hc U` hY @Yfb]b[`Ci hWca YgZ YgdYWU`mCi hWca Yg%UbX`("

7 ci fgY GWYXi `Y

[J \]yk WUgg`ha YhUV`Y](#)

H]a YhUV`Y`

8 UH	HmdY	7 cbhYbh
K YY_%% : YVfi Ufm! &(: YVfi Ufm	@YWi fY	7 i ffYbhXYVUHg. hfi h`UbX`XYa cWUWtza YX]U di V]WgZhfUbgbUhfcbU`a cV]hYgZ X][]hU`UW]j]ga`
K YY_&.&) : YVfi Ufm! " A UfW	@YWi fY	H\Y`U`hfi h`g`U`g`Yhi g`ZY3`Dcghfi h`z`di V`]W`_bck`YX[Yz`W]hYbg`d`
	Hi hf]U`	7 cbhYa dcfUfm`]Z`Ug`U`a YX]U`YI dYf]YbW`
K YY_`.(`A UfW !`%\$ A UfW	@YWi fY	8][]hU`]bh]a UW]Yg!`]g`hY`df]j UH`bck`di V`]Wb`
	Hi hf]U`	8][]hU`Ui X]YbW]g`UbX`Z]hYf`Vi VV`Yg`
K YY_(`.%`A UfW !`%+ A UfW	@YWi fY	GcWU`a YX]U`UbX`j]c`YbW`
	Hi hf]U`	B Yfk cf_YX`U`]UbW]gZ`cb`]bY`fY`Uhfcbg`]dg`
K YY_)`.%`A UfW !`&(A UfW	@YWi fY	H\Y`:`cVU`Gci h`!`X]ghUbhUbX`dfcl`]a UH`gi ZYf]b[`
	Hi hf]U`	Hfc`]b[`UbX`hYffc`f`
K YY_*.&) `A UfW !`" % A UfW	@YWi fY	DfYW]f]ci g`]j`Yg`!`i`a`Ub]hUf]Ub`Wca`a`i`b]W]hcb`
	Hi hf]U`	6 YUf]b[`k`]bYgg`
K YY_+. `%5df]`!`+`5df]`	@YWi fY	9 a`chcbgZ`UW]j`]ga`UbX`gcW]c!`dc`]hW]`WX`Ub[`Y`
	Hi hf]U`	HfUbgbUhfcbU`di V]Wg`UbX`hY`Wca`a`i`b]hUf]Ub`]a`U[`]bUhfcb`
K YY_`,`;`,`5df]`!`%(`5df]`	@YWi fY	K`l`c`a`UXY`a`m]D`cbY3`HfUbgbUhfcbU`X][]hU`U`Vci`f`
	Hi hf]U`	5`X][]hU`a`YX]U`di V]Wgd`YfY3`
K YY_-. `%`5df]`!`&%`5df]`	@YWi fY	H\Y`a`YX]U`f`i`g`-`fYj`]g]h]b[`hY`XYVUH`g`
	Hi hf]U`	5gg][`ba`Ybh-`WUgg`dfYgYbhUhfcbg`

F Ygci fWg

DfYgW]VYX`F Ygci fWg`

K YY_mfYUX]b[g`zcf`h`hf]U`g`k`]`VY`i`d`c`UXYX`cb`A`ccX`Y`"

F YWca a YbXYX`F Ygci fWg

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

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

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

≠mci`YbWci bHYf`U`dfcV`Ya`k`Yb`U`HYa`dh]b[`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybh`h`fci`[`\`Hi`fb]h]b`z`d`YUgY`
HY`Yd`cbY`9I`HYfbU`Gi`ddcfhcb`-`,`),`'`'`'`%cf`Ya`U]`h`Ya`cb`YI`HYfbU`HY`hgi`ddcfh4`i`bgk`"YXi`"Ui`"Gi`ddcfh`
`ci`fg`UfY`,`.\$\$Ua`-`-%\$.\$\$da`cb`k`YY`XUmg`UbX`-`.\$\$Ua`-`).\$\$da`cb`k`YY`YbXg`fI`*)`XUmg`U`mY`UfL`≠mci`
UfY`i`bUV`Y`hc`gi`Va`]hmc`i`f`Ugg][`ba`YbhXi`Y`hc`U`ZU`ihk`]h`Hi`fb]h]b`mci`a`Um`Udd`mi`Zc`f`Ub`YI`HYbg]cb`z`Vi`hmc`i`
a`i`ghfY`hU]b`mci`f`h]W`Yhbi`a`VYf`Zca`9I`HYfbU`Gi`ddcfhfU`cb[`k`]h`Ubmc`h`Yf`fY`Yj`UbhXcW`a`Yb`hgL`hc`
]bWi`XY`Ug`Yj`]XYbW`hc`gi`ddcfhmc`i`f`YI`HYbg]cb`Udd`]W]h]cb"≠mci`Ya`U]`9I`HYfbU`Gi`ddcfhmc`i`k`]"`

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 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`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 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
]bWi XYg`dfcj]X]b[`mci f`k cf_]hc`UbchYf`gh`XYbhVYZc`fY`hY`Xi Y`XUHYz`cf`Zc`f`hY`di fdcgY`cZ`hY`a

- 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'U'g'U'ghUbx'UfX'g'cZVY\Uj]ci f'Y'I dY'W'X'cZYj Yf'ncbY']b'U'Y'I BGK 'W'a a i b]m
- `cW'U'Y'gY'fj]W'g'UbX']b'Z'fa U'h'cb'UV'ci hi BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZ'U'g'U'ghUbx'UfX'g'cZVY\Uj]ci f'Y'I dY'W'X'cZYj Yf'ncbY']b'U'Y'I BGK 'W'a a i b]m

[\hd. #gj V'Y'W'f i \]X'Y'g" \]V'f'U'f'm'i bgk "Y'X'i "U'i #' \]g'Y'#U'V'ci h' \]g'Y](#)

5 WUXYa]WbZcfa 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 BGK`<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`]`hm/
- UbX`chYf`YggYbh]U`UWUXYa]W]bZcfa Uh]cbz`gYY

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

⇒ U[Y`7 fYX]h

5i gh]b`&\$% `G\`]b[`K i

7F ⇒ CG

7F ⇒ CG`Dfcj]XYf`7cXY.`\$\$\$- , ;