



ARTS3091

5Xj UbWX'A YXJU'ggi Yg

HYfa 'C.bY'##'&\$%

7ci fgY`Cj Yfj JYk

`GHUZZ7cbhUW`i8YHUJ`g`

`7cbj Ybcfg`

| B Ua Y | 9a Uj` | 5j Uj`UVj]m | @cWjhcb | D\cbY |
|-------------------|-----------------------------|----------------------------|--|------------|
| 5bXfYk `A i fd\jY | U"a i fd\jY4 i bgk "YXi "Ui | Uddc]bha Ybhj]U Ya Uj` | F cVYfh K YVghYf 6i]X]b[ž' %%< | -',))) (, |

GVXcc`7cbhUW`i8Zcfa Uhjcb

Fcca " %&ž`Yj Y`" `F cVYfhK YVghYf`6i]X]b[

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

9a Uj`. [gUa 4 i bgk "YXi "Ui](#)

K YVg]hY. [\hfdg.#gUa "Ufng"i bgk "YXi "Ui](#)

5ggYgga Ybh

GYY`hY`Wci fgY`A ccX`Y`g]h`"

5ggYgga YbhiHUg_g`

| | | | |
|--|-----------|----------------------------|---|
| 5ggYgga YbhiHUg_ | K Y][\ h | 8i Y`8UH` | Ghi XYbh@YUfb]b[Ci hWta Yg`5ggYggYX |
| DYfgcbU`7ci fgY`5fW]j Y`UbX F YZYW]cbg` |) \$i | Bch5dd`]WUV`Y | %z&Z ž{ |
| :]bU`9ggUm |) \$i | &*#\$(#&\$%-`\$) .\$\$`DA | %z&Z ž{ ž} ž* ž+ |

5ggYgga Ybhi8YHU]`g

5ggYgga Ybh%`DYfgcbU`7ci fgY`5fW]j Y`UbX`F YZYW]cbg`

GHUfhXUH`. Bch5dd`]WUV`Y

@Yb[h. `*`I`(`\$\$`k`cfX`V`c[`dcgh`g`cfYei]j U`YbhfgY`A ccX`Y`Wci fgY`g]h`Z`f`a`cfY`XYHU]`g`

8YHU]`g. `*`I`(`\$\$`k`cfX`V`c[`dcgh`g`cb`A ccX`Y`Z`UggYggYX`h`k]W`ž`cbW`YUf`mk]h`Z`f`a`Uh`j`Y`Z`Y`X`V`U`W`_`"

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

GYY`hY`A ccX`Y`Wci fgY`g]h`Z`f`a`cfY`XYHU]`g`"

Gi Va]gg]cb`bch]g.Mci `bYXX`h`c`gi Va]hV`c[`dcgh`g`Z`f`k`YY_g`&`UbX`" VY`Z`f`Y`h`Y`h`h`c`f]U`g`Z`f`h`c`g`Y`k`YY_g`"Mci `h`Y`b`b`Y`X`h`c`W`c`c`g`Y`Z`c`i`f`k`YY_g`Z`f`c`a`k`YY_g`(`h`c`-`h`c`gi Va]hV`c[`dcgh`g`Z`U`k`Um`g`VY`Z`f`Y`h`Y`h`h`c`f]U`Z`f`h`Y`k`YY_]`b`j`c`]YX`"Mci `a`i`ghi`g`Y`h`Y`V`c[`g`c`Z`k`U`f`Y`d`f`c`]X`Y`X`c`b`A`cc`X`Y`h`c`d`c`g`h`"

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

5ggYgga Ybh&.`:]bU`9ggUm

GHUfhXUH`.

@Yb[h. `` \$\$\$`k`cfX`g`cfYei]j U`Ybh

8YHU]`g. `` \$\$\$`k`cfX`g`ž`fi`Vf]W`cb`m`Z`Y`X`V`U`W`_`"

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

9ggUm]c`d]W`g`UbX`Z`f`h`Y`f`]b`g`f`i`W`]cb`g`k`j`VY`d`c`g`h`Y`X`c`b`h`Y`W`ci`fgY`A`ccX`Y`g]h`"

Gi Va]gg]cb`bch]g.Gi Va]hj]U`Hi fb]h]b`cb`h`Y`W`ci`fgY`A`ccX`Y`g]h`"

Hi fb]h]b`gYh]b[. H\]g`Ugg][ba Ybh]g`gi Va]h`Y`X`h`f`c`i`[\`Hi fb]h]b`UbX`gh`XYbh`g`X`c`b`ch`g`Y`Y`Hi fb]h]b`g]a`]Uf]m`f`Y`d`c`f`g`"

5 HhYbXUbW F Yei JfYa Ybhg

@YWhi fYg'UbX'c hYf'a UHfJ]U'g'Zcf'Hi hcf]U'DfYdUfUH]cb

Mci 'a i ghYb[U[Y'k]h' U''hY''YWhi fY'UbX'chYf'a UHfJ]U'g'Zcf'hi hcf]U'dfYdUfUH]cb'cb'j]bY''Mci 'a i ghXc'h]g VYZcfY'hY'h hcf]U'g'Zcf'hY'k YY_]bj c'j YX''i bYI W gYX''UW_cZYb[U[Ya Ybhk]h'a cFY'hUb'hk c'k YY_gfi 'YWhi fYg'UbX'chYf'a UHfJ]U'g'Zcf'hi hcf]U'dfYdUfUH]cb'k]''fYgi 'h]b'hY'Uk UfX'cZU'Z]j' [fUXY''

BchY'hUhYfY'j]g'U''YWhi fY'j]b'hY''YWhi fY'hYUfY'j]b'k YY_'cbYz'UbX'cb'm]b'k YY_'cbY''H\]g'j]g'gc'hUhk Y W]b'a YYhi d'hc[YhYf'cb'U'k \c'Y'Ve'i fgY'VUg]g'Uh'YUghcbW''5Whi U'UHhYbXUbW'Uh'h]g''YWhi fY'j]b'hY'hYUfY'j]g'cdh]cbU''<ck Yj Yfz'mci 'a i ghYb[U[Y'k]h' hY''YWhi fY'UbX'h hcf]U'dfYdUfUH]cbg'Zcf'k YY_'cbY'a' ^ VZ'Yj Yb'j]Zmci 'Xc'bchUHhYbX'hY''YWhi fY'j]b'hY'hYUfY''

H\Y'fYghcZ'hY''YWhi fYgZ'Zca' k YY_g'&hc' - z'k]''VY'cb'j]bY''H\YfY'k]''VY'bc''YWhi fYg'j]b'hY''YWhi fY'hYUfY'UZfY'k YY_'cbY''

h'YWhi fYg'mci 'k]''UW]j Y'mYb[U[Y'k]h' VefY'Ve'i fgY'Ve'bHhYbh'hUhk]''\Y'd'mci 'hc' UH]j]b'Ve'i fgY''YUfb]b[ci h'Ve'a Yg'%d+'''

Hi hcf]U'g

I bYI W gYX'UVgYbW'Zca' a cFY'hUb'hk c'hi hcf]U'g'k]''fYgi 'h]b'hY'Uk UfX'cZU'Z]j' [fUXY''? YYd'j]b'hc'i Wk k]h'mci f'hi hcf'UbX'c'hY'7 ci fgY'7 cbj Ybcf'UVci h'mci f'UHhYbXUbW'j]Z'hYfY'UfY'dfcV'Ya g''D'YUgY'bchY'hUh''=\UX'hc'k cf''j]g'bchfY[UfXYX'Ug'Ub'YI W gY'Zcf'a]gg]b['hi hcf]U'g''

h'hi hcf]U'g'mci 'k]''UW]j Y'mYb[U[Y'k]h' VefY'Ve'i fgY'Ve'bHhYbh'hUhk]''\Y'd'mci 'hc' UH]j]b'Ve'i fgY''YUfb]b[ci h'Ve'a Yg'%d+'''

Cj YfU'

D'YUgY'Ve'bHWhi5bXfYk 'f'hY'7 cbj Ybcf'Zmci 'UfY'\Uj]b['X]Z]W'h]Yg'j]b'h]g'cf'Ubmic'hYf'fYgdYWhi'k \Yb'j]h'Ve'a Yg'hc'mci f'Yb[U[Ya Ybhk]h'hY'Ve'i fgY''

7 ci fgY'GWXYXi 'Y

[J\]Yk'WUgg'h\]a YhUV'Y](#)

H]a YhUV'Y'

| 8UH | HmdY | 7cbhYbh |
|-------------------------------------|-------|--|
| K YY_% '% : YVfi Ufm! '&(: YVfi Ufm | Hcd]W | K \UhXc'k Y'W ffYbhmUggi a Y3'5Vci ha YX]U'UbX Vca a i b]WU]cbg3'5Vci h'hY'Wbc'c[m3'5Vci h dYcd'Y3'5Vci h'hY'k cfX3'5Vci h\ck 'U''hYgY Vca Y'hc[YhYf3'<ck 'i gYZ' 'UfY'hYgY'Uggi a dh]cbg]b'U'WU]b[]b['k cfX3 |
| K YY_&.&) : YVfi Ufm!' A UfW | Hcd]W | H\Y'j]b'WfYUg]b['mj Ughdck Yfg'cZa YX]U'UbX Vca a i b]WU]cbg'j]b'YI dUbXYX'Z]Y'Xg—hYbg]cbg VYhk YYb''hY'k cfX'Ug'a YX]i a ''UbX'hY''h]fX a YX]U'fYj c'i h]cb'' |
| | | |



F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

GYY`7ci fgY`A ccX`Y`G]H`Zcf`fYgci fWg`"H\YfY`]g`bc`7ci fgY`F YUXYf`Zcf`h`]g`Wci fgY`"5`"fYUX]b[g`UbX`
c`h`Yf`a`U`H`f]U`g`z`c`f`"b_g`h`c`h`Y`g`Y`z`W`b`V`Y`Z`i`b`X`c`b`h`Y`W`ci`fgY`A`ccX`Y`g]H`"

F YWca a YbXYX`F Ygci fWg

GYY`Wci fgY`A ccX`Y`g]H`"

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

7ci fgY`ZYXVUW`]g`[U`h`Y`f`Y`X`j`]U`X]g`W`gg]cb`UbX`c`V`g`Y`f`U`h]cb`Xi`f]b[`W`U`gg`Y`g`z`j`]U`U`gg][ba`Y`bhik`cf`_`z`UbX`
j`]U`h`Y`A`m`9i`d`Y`f]Y`b`W`gi`fj`Y`mg`"H`]\g`m`Y`U`f`h`Y`W`ci`fgY`U`g`V`Y`Y`b`g]a`d`]Z`Y`X`UbX`h`Y`f`Y`U`X]b[g`W`h`V`U`W`]b`
f`Y`g`d`c`b`g`Y`h`c`Z`Y`X`V`U`W`"

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`hik`]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 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[Ygž`UfhUbX`XYg][b`dfc`YWgž`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`U`b[]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`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 hW`YX]h`UbX`hc`
d]YW]b[`hc[Y`hYf`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 dYW'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'Y'fg'k]''VY'bYk "'; U]b]b['U'gc`]X'i bXYfghUbx]b['cZU''h'Y fY'UH'X'UgdY'W'g'cZ9@-G9'k]''\Y'd'mci 'a U_Y'h'Y'a cgh'cZ'mci f'gh X]Yg'Uhl BGK ""

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

5 WUXYa]WbZcfa Uhcb`

: cfYggYbh]U`ghi XYbh]bZcfa Uhcb`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`]`hm/
- UbX`chYfYggYbh]U`UWUXYa]W]bZcfa Uh]cbz`gYY

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

⇒ U[Y`7 fYX]h