



# LING5031

ggi Yg`b`GYWt`bX`@Ub[ i U[ Y`5Wti ]g]h]cb

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

GWXcc`cZ< i a Ub]h]Yg`UbX`@Ub[ i U[ Yg`##`I BGK ``5ftg`UbX`GcWU``GWYbWg

# 7 ci fgY`Cj Yfj ]Yk

'GHUZZ'7 cbhUWh'8YHU]`g`

'7cbj Ybcfg`

B Ua Y	9a U]`	5j U]UV]]]m	@cWUhc b	D\cbY
>Ua Yg`@YY	^Ua Yg`YY4 i bkg "YXi "Ui	A cbXUm' !( `da	&&* `A cfj Yb 6fck b	dfYZf`Ya U]

## GWx cc``7 cbhUWh`bZcfa Uh]cb

GWx cc``cZ<i a Ub]h]Yg`UbX`@Ub[ i U[ Yg

@cWUhc b. 'GWx cc``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 bkg "YXi "Ui](#)

## 5 hYbXUbW`F Yei ]fYa Ybhg

5`gh XYbh]g`YI dYW`X`hc`U`hYbX`U``WUgg`W`b`hUWh`lci fg`Zcf`U`ZUW`!hc`ZUW`fI &: E`cf`V`Yb`XYX`W`ci fgY`UbX`W`ca`d`Y`h`U``U`W`j]`h]Yg`Zcf`U`V`Yb`XYX`cf`Z`m`cb`]bY`W`ci fgY"

5`gh XYbhk` \c`Uff]j Yg`a cfY`h`Ub`%)`a`]bi`hYg`U`h`a`UmVY`dYbU`]gYX`Zcf`bcb!`U`hYbXUbW``Zgi`W`U`dYbU`m`]g`]a`d`cgYXž`hY`gh`XYbhia`i`ghVY`]b`Zcfa`YX`j`YfVU`m`Uh`hY`YbX`c`ZUWgg`UbX`UXj`]gYX`]b`k`f]h]b[ `k`]h`b`&(`\ci fg"

zU`gh XYbhYI dYf]YbW`g`]`bYggž`a`]gUXj Ybh`fY`cf`chYf`cW`ffYbW`h`Uha`U`Yg`UVgYbW`Zca`U`WUgg#UW]j`]mi`bUj`c]XUV`Yž`cf`YI dYW`g`hc`VY`UVgYbhZca`U`Zc`f`h`W`ca`]b[ `WUgg#UW]j`]mž`h`Ymg`lci`X`g`YY`dYfa`]gg]cb`Zca`h`Y`7`ci`fgY`5i`h`cf]mž`UbX`k`Y`fY`Udd`]WUV`Yž`hY]f`fYei`Yghg`lci`X`VY`UW`ca`dUb]YX`VmUb`cf][`]bU`cf`W`f]h]YX`W`dmcZU`a`YX]W`W`f]h]ZUW`h`cf`chYf`Zca`cZUddfcdf]U`h`Yj`]XYbW"

5`7`ci`fgY`5i`h`cf]ma`UmYI`W`gY`U`gh`XYbhZca`WUggYg`cf`UW]j`]h]Yg`Zcf`i`d`hc`cbY`a`cbh`<`ck`Yj`Yfž`h`Ym`a`UmUgg][`b`UXX]h]cbU`UbX`#`f`U`h`fb`Uh]`Y`hUg`\_`hc`Ybgi`fY`W`ca`d`]UbW``5`7`ci`fgY`5i`h`cf]mW`bg]XYf]b[ `h`Y`[`f`Ub]h]b[ `cZUVgYbW`a`i`ghVY`g`Uh]gZ]YX`U`gh`XYbhk`]`g]`VY`UV`Y`hc`a`YYh`h`Y`W`ci`fgY`g`Y`Ufb]b[ `ci`h`W`ca`Yg`UbX`#`f`j`ci`a`Y`cZ`Y`Ufb]b[ ``5`gh`XYbhgYY\_]b[ `Uddfcj`U`hc`VY`UVgYbhZca`a`cfY`h`Ub`cbY`a`cbh`a`i`ghUdd`m`]b`k`f]h]b[ `hc`h`Y`8Y`Ub`UbX`dfcj`]XY`U``cf][`]bU`cf`W`f]h]YX`gi`ddc`f]h]b[ `XcW`a`Yb`h]h]cb"

:`cf`a`cfY`]b`Zcfa`Uh]cb`UVci`h`h`Y`U`hYbXUbW`dfc`hc`W`g`]b`h`Y`:`UW`h`mcZ`5`f]g`UbX`Gc`V]U`GW]YbW`g. [\hfdg.##k`k`k`"Uf\]g`i`bkg`"YXi`"Ui`#W`ffYbh\]gh`XYbhg#UW\]XYa`\\_W\]bZcfa`Uh\]cb`#f`c`f`c`W`g!`\[`i`\]XY`\]bYg#](#)

## 5 WUXYa ]W`bZcfa Uh]cb`

: cfYggYbhU`gh XYbh]bZcfa Uhcb`fY`Uh]b[ `hc. `fYei Yghg`Zcf`YI hYbg]cb/fYj ]Yk `cZa Uf\_g/cVW dUh]cbU``YU`h  
UbX`gUZ`m/YI Ua ]bUh]cb`dfcW`Xi fYg/gdYW]U`W`bg]XYfUh]cb`]b`h`Y`Yj Ybhcz]`bYgg`cf`a ]gUXj Ybh fY/

7 ci fgY'8YHJ]`g

7 fYX]hDc]bHg`\*`

Gi a a UfmicZ`hY'7 ci fgY

Mci`k]`YI d`cfY`h`fY`c] YfUfW]b[ `]ggi Yg`]b`gYw`bX`Ub[ i U[ Y`Uw`ei ]g]hcb`fYgYUfW. `hY`YZYWg`cZ ]bghf] W]cbz`ZcW`g`cb`Zcfa`z`UbX`hY`]bhYfUW]cb`UddfcUW`" `H\Y`]ggi Yg`YI d`cfYX`i bXYf`hY`YZYWg`cZ ]bghf] W]cb`UfY`k` \UhUgdYWg`cZgYw`bX`Ub[ i U[ Y`Uw`ei ]g]hcb`UfY`gi`gWdh]V`Y`fc`hY`YZYWg`cZ]bghf] W]cbz`hY`c] YfU`fU[ [ fY[ UH`E`YZYWg`cZ]bghf] W]cbz`W`bghfU]b[ `ZUW`c`fg`h`Uh`]a` ]hcf`chYfk`]gY`YI d`U]b`hY` YZYWg`cZ]bghf] W]cbz`UbX`Ub`YI`Ua` ]bU]cb`cZ`hY`W`b`hY`hg`cZ`YUfb]b[ `fY`["`z`WUggfcca` ]`Yfgi`g`gh`Xm UVfcUXE`" `H\Y`]ggi Yg`YI d`cfYX`i bXYf`ZcW`g`cb`Zcfa` `UfY`hY`fc`Yg`cZ`dfUW]W`z`YI d`UbU]cb`UbX`ZYXVUW` ]b gYw`bX`Ub[ i U[ Y`Uw`ei ]g]hcb`" `H\Y`]ggi Yg`YI d`cfYX`i bXYf`hY` `bhYfUW]cb`5ddfcUW`UfY`k` \UhV`bgh]h`hYg` Yj`]XYbW`h`Uh`YUfb]b[ ` \Ug`hU`\_Yb`d`UW`Ug`U`fYgi`h`cZ]bhYfUW]cbz`hY`ci`h`W`a`Yg`cZ`U`ZcW`g`cb`Zcfa` `Xi`f]b[ ]bhYfUW]cbz`ZYXVUW`\_Xi`f]b[ `]bhYfUW]cbz`UbX`UhY`bh]cb`UbX`Uk`UfYbYgg"

5 h`hY`W`b`Wi`g]cb`cZ`h`]g`W`i`fgY`h`Y`gh`XYbhk`]`VY`UV`Y`fc

%`W]h]W`"mYI`Ua`]bY`UbX`Yj`U`i`UH`Ya`d]f]W`"fYgYUfW`]bWi`X]b[ `]ggi Yg`cZ`fYgYUfW`XYg][`b`UbX`XUH` UbU`mg]g`  
&`YI`d`]WUH`hY`a`U]b`dc]bHg`cb`j`Uf]ci`g`]ggi Yg`]b`gYw`bX`Ub[ i U[ Y`Uw`ei ]g]hcb`fYgYUfW`  
'`" `W`bghf]`W`h`U`fYj`]Yk`cZ`]hYfU]h`fY`h`Uh]XYbh]Z]Yg`hY`" ]a` ]h]cbg`cZ`h`Uh`Vc`Xmc`Zk`cf`\_`UbX`W`b`Wi`XYg` k`]h`U`W` \YfYbhgYhcZ`Z`h`fY`cc`\_]b[ `fYgYUfW`ei`Ygh]cbg`UbX` \md`chYg]gYg`d`chYbh]U`ci`h`W`a`Yg` (  
(`" `dfcdcgY`fYkYg][`bE`Ub`Ya`d]f]W`"gh`Xm`h`Uh`UXX`fYggYg`U`g`YhcZ`fYgYUfW`ei`Ygh]cbg`UbX`hY`gh]U`g`YhcZ` \md`chYgYg`

HYUW]b[ `G`h`f`U`h`[ ]Yg`

5`" `fYUX]b[ g`Zc`f`h`]g`W`i`fgY`UfY`Ya`d]f]W`"gh`X]Yg`YI`Ua`]b]b[ `hY`gYw`bX`Ub[ i U[ Y`Uw`ei ]g]hcb`cZ`]b[ i ]gh]W` ghf]`W`h`fYg`" `H\Y`cf]Ybh]h]cb`cZ`hY`fYgYUfW`]g`Uf[ Y`mei`Ub]h]h]Y`" `K`Y`UddfcUW`YUW`fYUX]b[ `a`Y`h`c`X]W`"n`":` ]fg]z`k`Y`YI`Ua`]bY`hY`Ui`h`c`ff]g]h]U`Ya`Ybh`cZ`hY`dfcV`Ya`h`c`VY`fYgYUfW`YX`" `K`Y`UbU`mY`hY` fYj`]Yk`cZ`]hYfU]h`fY`Ug`U`XYj`]W`h`c`a`ch]`Uh`fYgYUfW`ei`Ygh]cbg`UbX` \md`chYgYg`" `a`dcf]Ub]h]n`z`k`Y`YI`Ua`]bY` ]b`XYHJ]`hY`fYgYUfW`XYg][`b`UbX` \ck` ]h]UW`W`a`d`]g`Yg`hY`gh]h]X`[ cU`cf`U]a`cZ`hY`gh`Xm`K`Y`W`bg]XYf` XU`U`UbU`mg]g`UbX`hY`fYgi`hg`fc`ZYb`VUgYX`]b`gh]h]gh]W`UbU`mg]g`"

Gh`XYbh]a`i`gh]fYUX`WcgY`m`UbX`k`]h`XYHJ]`fc`UW`W`a`d`]g`h`hY`UV`cj`Y`gc`h`Uh`hY`W`i`fgY`W]b`VY`Ub` ]bhYfUW]Y`gYa`]bUf]ghmY`YUfb]b[ `YI`dYf]YbW`"

# 5ggYgga Ybh

5ggYgga YbhHUg\_g`

5ggYgga YbhHUg_	K Y][ \h	8i Y'8UH	Gh XYbh@YUfb]b[ Ci hWta Yg'5ggYggYX
F YgYUfW`dfcdcgU`	( \$i	\$, #0%#&\$% '\$' .\$\$'DA	%z&Z
7`Ugg`hYgh	( \$i	&\$#\$, #&\$% '%&.\$\$'DA	%z&
DfYgYbhUjcb`	&\$i	Bch5dd`]WUV`Y	%

## 5ggYgga Ybh8YHU]`g

5ggYgga Ybh%`F YgYUfW`dfcdcgU`

GHUfhXUH.`

@Yb[ h. `r' ) \$\$`k cfXg

8YHU]`g. Gh XYbhg`k ]`dfcdcgY`cf][ ]bU`zYa d]f]WU`fYgYUfW`"H\Y`dfcdcgU`k ]`W`bHU]b`U`ghUHa YbhicZhY`dfcV`Ya z`U`fyj ]Yk `cZ`]hYfUhi fYz`fYgYUfW`ei Yghjcbg`z`UbX`hY`a YhcXg`UbX`dfcW`Xi fYg`cZhY`dfcdcgYX`gh`Xn`k`f]hYb`ZYXVUW`

Hi fb]hb`gYhb[ . H\]g`Ugg][ ba Ybh]g`gi Va ]hYX`h`fci [ \`Hi fb]hb`UbX`gh XYbhg`Xc`bchgYY`Hi fb]hb`g]a ]Uf]mifYdcfng"

5ggYgga Ybh&.`7`Ugg`hYgh

GHUfhXUH.`

@Yb[ h. `]b`WUgg`hYgh

8YHU]`g.

Gi Va ]gg]cb`cZ5ggYgga YbhHUg\_g

- K cf\_`gi Va ]hYX`%\$`hc`%`XUmg`UZhYf`h`Y`gh]di`UH`X`XYUX`]bY`k`]`VY`UggYggYX`UbX`ZYXVUW`dfcj`]XYX`Vi`hU`a`Uf`\_`cZnYfc`k`]`VY`fYW`fYX`"Z`h`Y`k`cf`\_`k`ci`X`Uj`Y`fYW`]YX`U`dUgg`a`Uf`\_`Vi`hZcf`h`Y`UH`bYgg`UbX`h`Y`k`cf`\_`g`U`W`a`di`gcfm`W`i`fgY`W`a`dcbYbh`f`i`fX`Y`fYei`]fYa`YbhZ`U`gh`XYbhk`]`VY`XYYa`YX`hc`Uj`Y`a`Yh`h`UhfYei`]fYa`Ybh`
- K cf\_`gi Va ]hYX`&\$`cf`a`cfY`XUmg`UZhYf`h`Y`gh]di`UH`X`XYUX`]bY`k`]`bchVY`UW`W`dH`X`Zcf`UggYgga`Ybh`UbX`k`]`fYW`]Y`bc`ZYXVUW`za`Uf`\_`cf`[`fUXY`"Z`h`Y`UggYgga`Ybh`Ug`\_`]g`U`W`a`di`gcfm`W`a`dcbYbh`cZ`h`Y`W`i`fgY`U`gh`XYbhk`]`fYW`]Y`Ub`l`bgUhgZUW`c`fm`:`U`]`fl`:`k`[`fUXY`Ug`U`fYgi`hcZ`i`bgUhgZUW`c`fmdYfZ`fa`UbW`]b`Ub`YggYbh]U`W`a`dcbYbh`cZ`h`Y`W`i`fgY`"

H\]g`]bZ`fa`U`h`cb`]g`U`gc`Uj`U]UV`Y`Uh`

[\h\]g.#k`k`k`"Ufng`i`b`gk`"YXi`"Ui`#W`ffYbh\]gh`XYbh\]#JWJX`Ya`\]W\]bZ`fa`U`h`cb`#dfch`W`c`g`\[`i`\]XY`\]bYg`#`](#)

## GdYW]U`7`cbg]XYfU]cb`5`dd`]W]h]cbg`

Mci`W`b`Udd`m`Zcf`gdYW]U`W`cbg]XYfU]cb`k`Y`b`]`bYgg`cf`ch`Yf`W]fW`a`gh`Ub`W`g`]b`h`f`Z`f`Y`k`]h`m`ci`f`UggYgga`Ybh`d`Yf`Z`fa`UbW`"

G]W`bYgg`za`]g`U`X`j`Y`bh`f`Y`cf`ch`Yf`W]fW`a`gh`Ub`W`g`VY`nc`b`X`m`ci`f`W`c`b`f`c`a`Um`

f`D`f`j`Y`bh`m`ci`Z`ca`W`a`d`Y`h`b`[`U`W`i`fgY`f`Yei`]f`Ya`Y`bh`z`

f`?`Y`Y`d`m`ci`Z`ca`U`h`Y`b`X`]b`[`U`b`UggYgg`UV`Y`U`W`]j`]m`z`

f`G`h`c`d`m`ci`g`i`Va`]h`]b`[`UggYgg`UV`Y`k`cf`\_`Zcf`U`W`i`fgY`z`

f`G`[`b`]W]b`h`m`U`Z`Y`W`h`m`ci`f`d`Y`f`Z`fa`UbW`]b`UggYgg`UV`Y`k`cf`\_`z`VY`]h`U`Z`fa`U`Y`b`X`!`c`Z`g`Ya`Y`gh`f`Y`I`Ua`]b`U`h`c`b`z`U`W`Ugg`h`Y`g`h`z`U`U`V`c`f`U`h`c`f`m`h`Y`g`h`z`U`g`Ya`]b`U`f`d`f`Y`g`Y`b`h`U`h`c`b`c`f`U`b`m`c`h`Y`f`Z`fa`c`Z`UggYgga`Y`bh`

:`cf`Z`f`h`Y`f`XY`h`U`]g`]b`f`Y`U`h`c`b`hc`GdYW]U`7`cbg]XYfU]cb`]b`W`i`X`]b`[`"K`Y`b`hc`5`dd`m`z`"<`ck`hc`5`dd`m`UbX`"Gi`dd`c`f`h`b`[`8`c`W`a`Y`bh`U`h`c`b`"d`Y`U`g`Y`f`Y`Z`f`hc`h`Y`GdYW]U`7`cbg]XYfU]cb`k`Y`V`gh`Y`."

[\h\]g.#gh`XYbh`i`b`gk`"YXi`"Ui`#gdYW\]U`W`cbg\]XYfU\]cb`](#)

## 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" #WUbb'U\_Y'a Ubm Zcfa gž Zca 'XY'VYfUHY'WXUH]b[ 'hc'UWVXYbU`mWčdm]b[ Zca 'U'gci fW'k ]h'ci hUW\_bck 'YX[ Ya YbH'

I BGK '[ fci dg'd`U[ ]Uf]ga ]bhc'hY'Zč`ck ]b[ 'WUHY[ cf]Yg.

7cdm]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'dfYgYbU]cbg'k \YfY'gca YcbY'dfYgYbhg'UbchYf'g'XYUg'cf'k cfXg'k ]h'ci hW'YX]H'

#Uddfcdf]UHY'dUfUd\fUg]b[ .7 \Ub[ ]b[ 'U'Zk 'k cfXg'UbX'd\UgYg'k \]Y'a cghmifYU]b]b[ 'hY'cf][ ]bU'gfH' W'fY'UbX#cf'dfc[ fYgg]cb'cZ]XYUg'cZhY'cf][ ]bU'žUbX' ]bZcfa U]cb'k ]h'ci hUW\_bck 'YX[ Ya YbH' 'H\g'U'gc'Udd'Yg' ]b'dfYgYbU]cbg'k \YfY'gca YcbY'dUfUd\UgYg'UbchYf'g'XYUg'cf'k cfXg'k ]h'ci hW'YX]hUbX'hc'd]YW]b[ 'hc[ YhYf'ei chYg'UbX'dUfUd\UgYg']bhc'U'bYk 'k \c'Yžk ]h'ci hUddfcdf]UHY'fYZfYbW]b[ "

7c`i g]cb.'k cf\_]b[ 'k ]h'chYfg'Vi hdUgg]b[ 'cZhY'k cf\_'Ug'U'dYfgcb'g' ]bX]j ]Xi U'k cf\_"7c`i g]cb'U'gc ]bW' XYg'dfcj ]X]b[ 'mci f'k cf\_'hc'UbchYf'gh'XYbhVYZc'fY'hY'Xi Y'XUH'žcf'Zc'f'hY'di fdcgY'cZhYa d`U[ ]Uf]g]b[ 'UhUbmi]a Yž'dUm]b[ 'UbchYf'dYfgcb'hc'dYfZc'fa 'Ub'UWUXYa ]W'Ug\_žghU' ]b[ 'cf'UWči ]f]b[ UbchYf'dYfgcb'g'UWUXYa ]Wk cf\_'UbX'Wčdm]b[ ]h'čZf]b[ 'hc'Wča d'YH'UbchYf'dYfgcb'g'k cf\_'cf'gYY\_]b[ dUma YbhZc'Wča d'Y]b[ 'UWUXYa ]Wk cf\_"

#Uddfcdf]UHY'W]U]cb.'7 ]]b[ 'gci fW'g'k \]W\Uj Y'bchVYYb'fYUXžk ]h'ci hUW\_bck 'YX[ ]b[ 'hY'"gYWčbXUfm' gci fW'Zca 'k \]W'\_bck 'YX[ Y'cZhYa '\Ug'VYYb'cVU]bYX"

8i d']WU]cb'f'fY'Zd`U[ ]Uf]ga "L'gi Va ]H]b[ 'mci f'ck b'k cf\_ž]b'k \c'Y'cf']b'dUf'žk \YfY']h\Ug'dfYj ]ci g'm VYYb'dfYdUfYX'cf'gi Va ]H'X'Zc'f'UbchYf'UggYgga Ybhcf'Wč' f'gY'Uhi BGK 'cf'UbchYf'i b]j Yfg]m'

7cffYW'fYZfYbW]b[ 'dfUW]W'g.



- 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'WdhUV'Y'I gY'cZ  
I BGK '⇒H'F Ygci f'W'g'Dc`]Wm
- VY'Uk UfY'cZh'Y'ghUbXUfXg'cZVY\Uj ]ci f'YI dYW'X'cZYj Yfmcby`]b'h'Y'I BGK 'W'a a i b]m
- `cW'W'gYfj ]W'g'UbX' ]bZ'fa U]cb'UVci hl BGK 'UbX'I BGK '@]VfUfm

7 ci fgY'GWXYXi `Y

[J.Jyk.WUgg.ha.YhUV.Y](#)

H]a YhUV`Y`

8UHr	HmdY	7cbhYbh
K YY_% '&' >i `m! '&- >i `m	GYa ]bUf	=hfcXi W]cb F YUX]b[ `GYh%"
K YY_&." \$>i `m!) 5i [i gh	GYa ]bUf	F YUX]b[ `GYh&"
K YY_" .!* `5i [i gh! %& 5i [i gh	GYa ]bUf	F YUX]b[ `GYh' "
K YY_(. % `5i [i gh! %- 5i [i gh		

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

H\YfY`]g`bc`hI`hcc\_`zcf`h]g`Wci`fgY`"5`"fYUX]b[ g`UfY`'ci`fbU`"Ufh]WYg`h`UhWUb`"VY`"UWYggYX`h`fci`[ \`h`Y`  
@]VfUfm`

F YWca a YbXYX`F Ygci fWg

BchUj U]UV`Y

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

Gh XYbhZYXVUW\_`]g`[ U\h`YfYX`h`fci`[ \`a`miYI`dYf]YbW`"DFYj`]ci`g`ZYXVUW\_`\Ug`"YX`h`c`WXUb[ Yg`]b`h`Y`  
fYei`]fYX`fYUX]b[ g`"

⇒ U[ Y`7fYX]h

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

7F ⇒ CG

7F ⇒ CG`Dfcj`]XYf`7cXY`.\$\$\$-` ;` ;`