

# **LING5006**

7 i ffYbhʻ=ggi Ygʻ]bʻ6]`]b[ i U`]ga

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

# 7ci fgY<sup>-</sup>Cj Yfj ]Yk

### GHJZ7cbHJWh8YHJ]`g

#### 7cbj Ybcfg

B Ua Y	9a U]`	5j U]`UV]`]lm	@cWJhjcb	D\cbY
5b]_ï '< Uhcgg		-	A cfj Yb 6fck b &* *	\$&`-',) ,'(\$

#### GWXcc``7cbHJWhi±bZcfa Uh]cb

GWkcc`cZ<iaUb]hJYg'UbX'@Ub[iU[Yg

@c\\U||cb. G\\cc``C\\Z|\\\žA\cfj\Yb'6fck\b'6i]\X]b[\z'@\j\Y``&z'&),

CdYb]b[ '<ci fg. 'A cbXUm'! : f]XUmž - Ua '! ') da

D\cbY.'Ž\*%'&'-',)'%\*,%

: UI . 'Ž \* %'&'-' , ) ', +\$)

9a U]`. '<u>\U`4 i bgk "YXi "Ui</u>

### 7ci fgY 8YHJ] g

#### 7 fYX]hDc]bhg \*

#### Gi a a UfmcZh\Y 7ci fgY

H\]g`Wci fgY`k ]``YbUV`Y`mci 'hc`]bj Ygh][ UhY`h\Y`bUhi fY`cZV]`]b[i U`]ga `VmZcW g]b[ 'cb`\ck ']hiYj c`j Yg`UbX\ck ']hi]g`a U]bhU]bYX`]b`Ub`]bWfYUg]b[ `m[ `cVU`]gYX`k cf`X"'=kk ]```YbUV`Y`mci 'hc`i bXYfghUbX`h\UhiV]`]b[i U`]ga `Wb`VY`ghi X]YX`UhUb`]bX]j ]Xi U```Yj Y``fZcW g]b[ 'cb`dgmWkc`]b[i ]gh]Wž'bYi fc`]b[i ]gh]Wž'UbX`Wc[ b]hjj Y UgdYWfgŁžVi hiU`gc 'Uh'U`gcW]YhU```Yj Y``fZcW g]b[ 'cb`gcW]c`c[ ]WU`ž']bhYfW``hi fU`ž'UbX`]XYc`c[ ]WU``Xca U]bgŁ" Mci 'k ]``\Uj Y`h\Y`cddcfhi b]hmhc`Yl d`cfY`U`fUb[ Y`cZhcd]Wg`k ]h\]b`h\Y`ghi XmcZV]`]b[i U`]ga ž]bWi X]b[.`\ck Wca a i b]h]Yg`UbX`]bX]j ]Xi U`g`a U\_Y``Ub[i U[ Y`W\c]Wfgž\ck 'V]`]b[i U`]ga `XYj Y`cdg`h\Y`VfU]bž'h\Y UXj UbhU[ Yg`cZV]`]b[i U`]ga `Zcf`W\]`XfYbfg`XYj Y`cda Ybhž'UbX`h\Y`gcW]U``VYbYZ]hg`cZgi ddcfh]b[ 'a ]bcf]hm`Ub[i U[ Yg"`

#### 7 ci fgY @YUfb]b[ 'Ci hWca Yg

%" 9 | d`U]b`VUg]WWcbWdh U``UbX'Ya d]f]WU``]ggi Yg`]b h\Y'gh XmcZV]`]b[ i U`]ga "

- $\label{eq:continuous} \begin{picture}(20,0) \put(0,0){\line(0,0){100}} \put(0,0){\line(0,0){100}}$
- ("8YZYbX'cf'WXU``Yb[Y'`Ub[i U[Y'dc`]W]Yg'cb'V]`]b[i U``XYjY`cda YbH'

#### HYUWX]b[ GlfUhY[]Yg

7`UggYg'k]``HJ\_Y'U'k cf\_g\cd'Zcfa UH'K\]Y'H\YfY'k]``VY'gca Y'g\cfh']bHcXi Wljcbg'hc'H\Y'H\Ycf]Yg']b'U

YWli fY'Zcfa Uhža cgh'hja Y'k]``VY'gdYbh'cb']bHYfUWlji Y'[fci d'X]gWi gg]cbg'Wcbg]XYf]b['\_YmWcbWl'dhgž]ggi Yg
UbX'dfcV`Ya g"'Ghi XYbhg'k]``VY'YI dYWMYX'hc'Xc'gYhfYUX]b['HJg\_g'k YY\_`m'UbX'Xc'U'%\$'a]bi HY'WUgg
dfYgYbhUhjcb"'

# 5ggYgga Ybh

Ghi XYbhgʻUfYʻfYei ]fYX`hcʻi gYʻ5D5ʻfYZYfYbW]b[ ˈZcfʻU```h\Y]fʻUgg][ ba Ybhg"`K cfX``Yb[ h\`XcYgʻbch']bWi XYʻh\Y `]ghcZfYZYfYbWfg"

#### 5ggYgga Ybh HUg\_g

5ggYgga Ybh'tUg_	K Y][ \h	8iY'8UhY	Gh XYbh@YUfb]b[ Ci hWca Yg 5ggYggYX
7`UggʻhYghi	' \$1	% #\$' #&\$&%'\$(.\$\$'DA	%
DfYgYblUljcb	&\$I	k YY_`mfcghYf	' <u>ž</u> '(
F YgYUfWX 'YggUm'	) \$1	'\$#\$(#&\$&%`\$(.\$\$`DA	&ž'' ž'(

#### 5ggYgga Ybh8YHJ]`g

5ggYgga Ybh% 7`Ugg'hYgh

8YHJ]`g.

HYghf%\fŁcb'hcd]Wg'WcjYfYX']b'h\Y'WcifgY"'8Y`]jYfYX'cb`]bY"'±bX]j]XiU`'ZYYXVUW\_k]``'VY'dfcj]XYX"

5ggYgga Ybh& DfYgYbhJh]cb

GhUfhXUhY. Bch5dd`]WUV`Y

8 YW] g.

5 'WUgg dfYgYbHJhJcb'fl%\$'a ]bi hYgŁ'VUgYX'cb'gYhfYUX]b[g'UbX'hcd]Wg'Wcj YfYX']b'h\Y'Wci fgY"'±bX]j ]Xi U' ZYYXVUW\_'k]``'VY'dfcj ]XYX"

Hi fb]hjb gYhjb[. H\]g ]g bchU Hi fb]hjb Ugg][ ba Ybh

5ggYgga Ybh' . F YgYUfW YggUm

GhUfhXUhY. Bch5dd`]WUV`Y

@Yb[h\. &\$\$\$ k cfXg

8YHJ]`g.

5 'fYgYUfW. 'YggUmfUddfcl ]a UhY`mi&\$\$\$'k cfXgŁ'cb'UbmcZh\Y'a U'cf'hcd]Wg'Wcj YfYX']b'h\Y'Wci fgY" ±\X]j ]Xi U``ZYYXVUW\_k ]```VY'dfcj ]XYX"'H\]g'h\Y'Z]bU``UggYgga YbhZcf'UhYbXUbW'di fdcgYg"

Gi Va ]gg]cb bchYg. gi Va ]hcb`]bY

# 5 https://bxubwww.Fyei]fYaYbhg

Ghi XYbhgʻUfYʻghfcb[`miYbWci fU[YX'hcʻUhhYbX'U```WUggYgʻUbX'fYj ]Yk '`YWhi fY`fYWcfX]b[g"

# 7ci fgY'GWXYXi `Y

#### J]Yk 'WUgg'ha YhUV'Y

## H]a YtUV`Y

8 UhY	HmdY	7 cbh/bh	
K_YY_"%"%)": YVfi Ufmi!"%	Hcd]W	±btfcXi Whjcb. 8YZ b]hjcbg cZV]`]b[ i U`]ga	
: YVfi Ufm		A 11\ a a billia '11\/1 bi/a a . '7\ 11db/6'0/	
		AU\cchJub`HYIhVcc_`7\UdhYf`%	
		< Ua Yfg'UbX'6`UbW7\UdhYf'%	
K YY_'&.'&&': YVfi Ufm!'&* : YVfi Ufm	Hcd]W	-ggi YgʻcZa YUgi fYa YbhcZV]`]b[i U`]ga '!' <ua yfg<br="">UbX'6`UbWHYI N/cc_'7 \UdN∕f'&amp;</ua>	
K YY_'' .'%'A UfWX'!') A UfWX	Hcd]W	C bhc[YbYg]g'cZV]`]b[i U`]hm'7\]`X[ccX'V]`]b[i U`]ga '	
		A U\cch]Ub`7\UdhYf`(`7\]`X\ccX`V]`]b[i U`]ga	
		< Ua Yfg'UbX'6`UbW7\UdhYf''	
K YY_'(.', 'A UfWX'!'\& A UfWX	Hcd]W	7 c[b]h]j Y YZZYWhg cZV]`]b[i U`]ga	
AUIW		A U\cch]Ub`7\UdhYf`).`6]`]b[iU`]ga 'UbX'h\Y'VfU]b	
		< Ua Yfg'UbX'6`UbWHYI hVcc_'7\UdhYf'(	
K YY_').'%) 'A UfWX'!'%-	Hcd]W	@Ub[iU[YžW`hifY`UbX`]XYbh]hm	
A UfVX		< Ua Yfg'UbX'6`UbW7\UdhYf',	
K YY_'*.'&&'A UfWX'!'&* A UfWX	Hcd]W	GcW]YHJ``V]`]b[i U`]ga 'UbX']bHYf[fci d'fY`Uh]cbg	
A OIVW		A U\cchJub`7\UdhYf`&	
		< Ua Yfg'UbX'6`UbWHYI Wcc_'7\UdHYf'%\$"	
K YY_'+.'&-'A UfWX'!'& 5df]`	Hcd]W	@Ub[i U[Y`Wfcgg]b[g.`WcXY!gk]hW\]b[ž'WcXY`a]l]b[ UbX`hfUbg`Ub[i U[]b[	
		AU\cchjub'7\UdhYf".'A]I]b[``Ub[iU[Yg.'ghfiWhifYg	
		UbX`Z bWgcbg	
		< Ua YfgʻUbXʻ6`UbW7\UdhYfʻ-	
K YY_', .') '5df]`'!'- '5df]`	Hcd]W	6]]b[iU`YXiWUh]cb	
		< Ua YfgʻUbXʻ6`UbW7\UdhYfʻ%%	
K YY_''%&'5df]`'!'%*	FYUX]b[	GhiXYbhgʻdfYdUfYʻZcfʻh\Y]fʻfYgYUfW\'YggUmʻBC	

5df]`		7@5GG9G <sup>*</sup> G7<981@98"		
K YY_'%\$.'%-'5df]`'!'&'	FYUX]b[	F YUX]b[ 'k YY_'! 'BC '7@5GG9G'G7 < 981@98"		
5df]`				

Gi Va ]gg]cb cZ5ggYgga YbhHUg\_g Hi fb]h]b Gi Va ]gg]cb

### 5 WUXYa ]W<cbYghmUbX D`U[ ]Uf]ga

D`U[]Uf]ga i]gii g]b[ih\Yik cfXgicfi]XYUgicZch\YfgiUbXidfYgYbh]b[ih\Ya iUgimci fick b"i±i\WbihU\_Yia Ubm Zcfa gžZfca iXYi]VYfUhYiW\YUh]b[ihciU\W]XYbhU`m\wcdm]b[iZfca iUigci f\Wik ]h\ci hiU\w\_bck iYX[Ya Ybh'

IBGK '[fci dg'd'U[]Uf]ga ']bhc'h\Y'Zc``ck]b[ 'WUhY[cf]Yg.

7 cdm]b[.'i g]b['h\Y'gUa Y'cf'j Yfmg]a]`Uf'k cfXg'hc'h\Y'cf][]bU`hYl h'cf']XYU'k]h\ci h'UW\_bck `YX[]b['h\Y gci fW'cf'i g]b['ei chUh]cb'a Uf\_g"'H\]g'U'gc'Udd`]Yg'hc']a U[Ygž'Ufh'UbX'XYg][b'dfcYWhgž'Ug'k Y``'Ug dfYgYbhUh]cbg'k \YfY'gca YcbY'dfYgYbhg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci h'WfYX]h'

± Uddfcdf]UhY 'dUfUd\fUg]b[.'7\Ub[]b['U'ZYk'k cfXg'UbX'd\fUgYg'k\]'Y 'a cghmfYhU]b]b['h\Y'cf][]bU' ghfi WhifY'UbX#cf'dfc[fYgg]cb'cZ]XYUg'cZh\Y'cf][]bU'žUbX']bZcfa UhJcb'k]h\ci hUW\_bck 'YX[Ya Ybh'H\]g'U'gc Udd']Yg']b'dfYgYbhUhJcbg'k\YfY'gca YcbY'dUfUd\fUgYg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci h'WfYX]hUbX'hc d]YW]b['hc[Yh\Yf'ei chYg'UbX'dUfUd\fUgYg']bhc'U'bYk'k\c'Yž'k]h\ci h'Uddfcdf]UhY'fYZYfYbW]b['"

7 c``i g]cb. 'k cf\_]b[ 'k ]th 'cth\Yfg'Vi hdUgg]b[ 'cZZth\Y'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'Ubch\Yf'ghi XYbhVYZcfY'h\Y'Xi Y'XUhYžcf'Zcf'h\Y'di fdcgY'cZth\Ya d`U[ ]Uf]g]b[ 'UhUbmh]a YždUm]b[ 'Ubch\Yf'dYfgcb'hc'dYfZcfa 'Ub'UWUXYa ]WhUg\_žghYU`]b[ 'cf'UWei ]f]b[ Ubch\Yf'dYfgcb'g'UWUXYa ]Wk cf\_'UbX'Wcdm]b[ ']hz'cZYf]b[ 'hc'Wca d`YfY'Ubch\Yf'dYfgcb'g'k cf\_'cf'gYY\_]b[

- i bXYfgHUbX'mci f'f][\hg'UbX'fYgdcbg]V]`]h]Yg'Ug'U'gh XYbhUhI BGK
   VY'Uk UfY'cZd`U[]Uf]ga ž'Wcdmf][\hz'I BGK 'Gh XYbh7cXY'cZ7cbXi WhUbX'5VWWdhUV`Y'I gY'cZ IBGK =7 HF Ygci fWrg Dc`]Wh

### 5 WUXYa ]W = b Zcfa Uh cb

: cf'YggYbhJU`'gh XYbh']bZcfa UhJcb'fY`UhJb['hc.

- fYei Yghg 'Zcf'Yl hYbg]cb/
- `UhY`gi Va ]gg]cbg`[ i ]XY`]bYg/
- fYi ]Yk 'cZa Uf\_g/
- I BGK '< YU'h\ 'UbX'GUZYhm'dc`]\\\Yg/
- YI Ua ]bUh]cb dfcWYXi fYg/
- qdYWJU``Wcbq]XYfUHjcb`]b`H\Y`Yj YbhcZ]``bYgg`cf`a ]gUXj Ybh fY/
- gh XYbhYei ]mUbX X]gUV]`]m/
- UbX'ch\Yf'YggYbhJU`'UWUXYa ]W]bZcfa UhJcbz'gYY

\hdg.#k k k "Ufhg"i bgk "YXi "Ui #W ffYbhgh XYbhg#UWJXYa ]W]bZcfa Uh]cb#dfchcWc`g![i ]XY`]bYg#

.

#### =a U[ Y 7 fYX]h

DWifY'hU Yb'Vm'WcifqY'WcbiYbcf

7F = 7CG

7F = CG'Dfcj]XYf'7cXY.\$\$\$-,;

#### 5W\_bck `YX[ Ya YbhcZ7ci bhfm

 $K Y : UW\underline{b} ck `YX[Y : h, Y : 6YXY[U : dY cd `Y : k \ c : UfY : h, Y : hfUX]h\underline{b} cb : `W ghcX]Ubg : cZh, Y ``UbXg : cb : k \ ]WX : I B G K ? Ybg]b[hcb : WUa di g : ]g ``cWUhYX''$