

# **SOCW4013**

 $7\]^X.UbX: Ua]^mK Y^ZUfY^DfUWfW$ 

HYfa "Hk c "# "&\$&%

## 7 ci fgY Cj Yfj ]Yk

### GHJZZ:7cbHJWh:8YHJ]`g

#### 7cbj Ybcfg

B Ua Y	9a U]`	5j U]`UV]`] <b>m</b>	@cWUhjcb	D\cbY
8f'D\]``]dU'9j Ubg	d"Yj Ubg4 i bgk "YXi "Ui	6mUddc]bha Ybh	A cfj Yb 6fck b	f\$&Ł'-\$*)
			%%)	')*'

#### Hi hcfg

B Ua Y	9a U]`	5j U]`UV]`]m	@cWJhjcb	D\cbY
>Yb GhYd\YbgYb	^ghYd\YbgYb4 i bgk "YXi "Ui	6mUddc]bha Ybh		
B][Y`GdYbW	b"gdYbWY4 i bgk "YXi "Ui	6m'Uddc]bha Ybh		

#### GWXcc``7cbHJWhʻ±bZcfa Uh]cb

GWXcc``cZGcWJU``GWJYbWYg

Fcca '%) -

A cfj Yb 6fck b 7 &\$

Ya U]`. 'gcgg4 i bgk "YXi "Ui

d\cbY. '\$&'-',) '% \$+

#### 7ci fgY 8YW] g

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

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

H\]g`Wci fgY`k]``]blfcXi WY`mci 'hc`dYfgdYWfj Yg`cb`ZJa]`mž`W\]`X\ccXž`W\]`X`k Y``VY]b[ž`W\]`XfYbfg XYj Y`cda YbhU``bYYXgž`W\]`XfYbfg`f][\hgž`W\]`X`a U`hfYUha YbhUbX`YVc`c[]\W``\WcbhYI hg\"\Mci `k]```UbU`mgY dfcZYgg]cbU``dfU\M]\W`]b\Yfj YbhJcb`UbX`ZJa]`mgi ddcfhž`W\]`X`dfchY\MJcbž'UbX`dfchY\M]j Y`\WJfY]bhYfj YbhJcbg`Zcf`\W\]`XfYb`Uhf]g\_ž`]b\Wi X]b[`ci hcZ\ca Y`\WJfYž'dYfa UbYb\miUbX`UXcdhJcb\"\Mci f`g\_]``g`]b UggYgga YbhUbX`\WJgY`a UbU[Ya Ybhk]```VY`UXXfYggYX\"

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

- %" 8 Ya cbghfUhY \_bck `YX[ Y`UbX`i bXYfghUbX]b[ 'cZW' ffYbhih\Ycfmž fYgYUfW\`UbX`Ybhfm`Yj Y``g\_]``g fY`Yj Ubhihc`ZJa ]`mUbX`W\]`X`k Y`ZJfY`dfUW]W\"`
- &" 8 Ya cbglfUhY 'Wca dfY\Ybg]cb 'cZh\Y 'h\Ycf]Yg 'cZh\Y 'Yh]c`c[ mcZj Uf]ci g 'Zcfa g 'cZa U`hfYUha Ybhž'UbX fYqYUfW\ 'cb 'h\Y]f 'dfYj U`YbW\žXYj Y`cda YbhU``qYei Y`UY`UbX`f]q 'UbX`dfchYWlj Y 'ZUWcfq"
- ' " 5 bU`mnY`h\Y`WcbgYei YbWYg`cZcddfYgg]cb`UbX`X]gWf]a ]bUh]cb`cb`h\Y``]j Yg`cZW\]`XfYb`UbX`ZJa ]`]Yg UbX`h\Y`YZZYWfg`cZh\Y]f`\]ghcfmik ]h\]b`h\Y`W\]`X`k Y`ZJfY`gmghYa ž`UbX`Udd`mYa dck Yfa Ybhidf]bWjd`Yg ]b`h\Y]f`dfUWfW"
- ("8Ya cbglfUhY`Yblfm`Yj Y``g\_]``g`]b`UggYgga YbhUbX`WUgY`a UbU[Ya Ybhi]b`dfchYWhj Y`WUfY`g]h Uh]cbg cZZJa ]`]Yg`UbX`W\]`XfYb"
- ) " 7 ca dfY\YbXž'UbU`mY`UbX`Yj U`i UhY`UddfcUW\Yg`lc`XY`]j Yf]b[`ZJa ]`mVUgYXž]b`\ca Y`gYfj ]WYg`l\Uh Yb\UbWY`l\Y`Z bWfcb]b[`cZZJa ]`]Yg`UbX`k Y```VY]b[`cZW\]`XfYb"
- \*" 7 ca dfY\YbXž'UbX'Yj U`i UhY'h\Y'`Y[ U`ž'gcW]U``UbX'dgmW\c`c[ ]\W\`fUa ]Z\\UhJ\cbg'cZdfchY\W]j Y gYfj ]\W'gž'ZcghYf'\WJfYž'UXcdh]cb`UbX'dYfa UbYb\\mid`Ubb]b[ 'cb'\W\]`XfYb`Uhf]g\_`'UbX'Ya d]f]\W\`Yj ]XYb\W'cb'h\Y]f'ci h\\care Ag"

#### HYUW ]b[ 'GhfUhY[ ]Yg'

5 'k YY\_`mcbY!\ci f``YWi fY 'Wcj Yfg'h\Y'h\Ycfm'UgdYWg'cZh\Y'Wci fgY"'5 'k YY\_`mik c'\ci f'gYa ]bUf'dfcj ]XYg Ub'cddcfhi b]hm'Zcf'ghi XYbhg'hc'Udd`mh\Y'h\Ycfm'hc'dfUWf)Wf'g]hi Uh]cbg''UbX`XYj Y`cd'g\_]``g'h\fci [\'i gY'cZ fc`Y'd`Umgž'WUgY'UbU`mg]g'UbX`ghi XYbh'dfYgYbhUh]cbg"'H\fYY'±bhYbg]j Y'k cf\_g\cdg'Wca V]b]b['h\Y'`YWi fY UbX'hi hcf]U`k]```VY'gWXYXi YX'Xi f]b['h\Y'hYfa"

#### 5ggYgga Ybh

#### 5ggYgga YbhHUg\_g

5ggYgga Ybh'HJg_	K Y][ \h	8iY'8UHY	Gh XYbh@YUfb]b[ Ci hWca Ygʻ5ggYggYX
7`UggʻdfYgYbhUhjcbʻ	' \$1	Bch5dd`]WUV`Y	' ž'(
A ]bcf'YggUmi	&\$I	&\$#\$*#&\$&%`%%\$\$`DA	%ž <sup>*</sup> &
A U⁄cf <sup>·</sup> YggUmi	) \$1	&) #\$+#&\$&%`%%\$\$`DA	( ž <sup>·</sup> ) ž <sup>·</sup> *

#### 5ggYgga Ybh'8YHJ]`g

5ggYgga Ybh% 7`Ugg dfYgYbhUh]cb

GhUfhXUhY. Bch5dd`]WUV`Y

8 YHJ]`g.

 $\label{eq:continuity} \text{Ghi XYbhg`XY`]j Yf`Ub`]bX]j ]Xi U``]b! WUgg`dfYgYbhUh]cb`cb`U`hcd]WU[ fYYX`k ]h\`cf`U``cWUhYX`Vmh\Y`Wci fgY Wcbj Ybcf''`$ 

Gh XYbhg fYWY]j Y'k f]hhYb 'ZYYXVUW\_'UbX'U'bi a Yf]\W``[ fUXY'k ]h\]b 'h\fYY'k YY\_g'cZgi Va ]gg]cb"'

#### 5XX]h]cbU`XYHJ]`g.

: i ft\Yf'XYHJ]`g'cZt\]g'UggYgga Ybh'UfY'Uj U]`UV`Y'cb'a ccX`Y''

5ggYgga Ybh& A ]bcf YggUm

GhUfhXUhY. Bch5dd`]WUV`Y

@Yb[ h\. '%\$\$\$

8 YW] g.

Gh XYbhgʻgi Va ]hUʻ‰\$\$\$`k cfX`YggUmcbʻh\Ycf]YgʻcZa UʻhfYUha Ybh'

Gh XYbhg fYVV) Yk f]hhYb ZYYXVUW\_UbX'Ubi a Yf]WJ`[ fUXY'k ]h\]b h\fYY'k YY\_g'cZgi Va ]gg]cb"

#### 5XX]h]cbU`XYhJ]`g.

: i fh Yf XYh J g f Y [ UfX]b [ h Y Ugg Ygga Ybh UfY Uj U] `UV Y `cb 'a cc X `Y "

5ggYgga Ybh' . 'A U'cf'YggUm

GhUfhXUhY. Bch5dd`]WUV`Y

@Yb[h\.'&\$\$\$

8YHJ]`g.

Gh XYbhg gi Va ]hU &z \$\$ k cf X YggUmcb Wc i fg Y h Ya Yg Ub X hcd] Wg "H ]g ']g 'h Y Z b U `Ugg Ygga Ybh Z cf 'h ]g Wc i fg Y "

Gh XYbhg fYVW] Y'k f]hhYb ZYYXVUW\_'UbX'U'bi a Yf]WU''[ fUXY'k ]h\]b h\fYY'k YY\_g cZgi Va ]gg]cb"'

#### 5XX]h]cbU`XYhU]`g.

: i fh Yf XY h J g f Y [ Uf X ] b [ h Y Ug g Y g g a Y b h U f Y U J U J U Y C b a c c X Y "

# FYgci fWYg

### DfYgWf]VYX`F Ygci fWYg`

 $5\,\tilde{}^{**}fYUX]b[\,g^{*}k\,]\tilde{}^{**}VY^{*}a\,\,UXY^{*}Uj\,\,U]\tilde{}^{*}UV^{*}Y^{*}cb^{*}a\,\,ccX^{*}Y^{*}j\,\,]U^{*}\mathscr{Q}'[\,\,Ubhc\,\,$ 

### FYWca a YbXYX FYgci fWYg

 $\label{eq:linear_continuity} $$Mci^k]^* Z_b X_j U_i^* UV_i^* UbX_f Y_i^* Y_j Ubha UhYf]U_i^* b^*h_Y^*Z_b^* ck^* b[^*\% ifbU_g^* Y_i^* X_j^*]b^*h_Y^* BGK^* Y_j^* Uffm$ 

### Gi Va ]gg]cb cZ5ggYgga YbhHUg\_g

### Hirtholdbisjoyca ]gg]cb

⊋mci YbWci bhYf`U'dfcV`Ya k\Yb`UhYa dhjb['hc'gi Va ]hmci f`Ugg][ ba Ybhh\fci [\'Hi fb]hjbž'd`YUgY
hY`Yd\cbY`9| hYfbU``Gi ddcfhcb'-',,)'''' %cf`Ya U]``h\Ya 'cb'Y! 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`fl \*) 'XUmg`U'mYUfŁ'''⊋mci UfY'i bUV`Y'hc'gi Va ]hmci f`Ugg][ ba YbhXi Y`hc'U'ZJi `hk ]h\'Hi fb]hjb`mci 'a UmUdd`mZcf'Ub'Y! hYbg]cbžVi hmci a i ghfYhJ]b`mci f`hj\\Yhbi a VYf'Zfca '9| hYfbU``Gi ddcfhfU'cb['k]h\'Ubmch\Yf`fY`Yj UbhXcW a YbhgŁ'hc
]bWi XY'Ug'Yj ]XYbWY'hc'gi ddcfhmci f'Yl hYbg]cb'Udd`]\WJhjcb'''⊋mci 'Ya U]`'9| hYfbU``Gi ddcfhmci 'k]``

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

D`U[]Uf]ga `]g`i g]b[ 'h\Y`k cfXg`cf`]XYUg`cZch\Yfg`UbX`dfYgYbh]b[ 'h\Ya `Ug`mci f`ck b"`±hWJb`hU\_Y`a Ubm Zcfa gžZfca `XY`]VYfUhY`W\YUh]b[ 'hc`UWW]XYbhJ``mWcdm]b[ 'Zfca `U`gci fWY`k ]h\ci hUW\_bck `YX[ Ya Ybh'

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

 $7 \text{ cdm}b[...i g]b[...h\Y.gUa Y.cf.j Yfmig]a] \Uf'k cfXg'hc'h\Y.cf][]bU''hYl h'cf']XYU'k]h\ci h'U\V_bck `YX[]b[...h\Y.cf][]bU''hYl h'cf']XYU'k]h'cf']$ 

### 5 WUXYa ]W + DZcfa 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/
- fYj ]Yk 'cZa Uf\_g/
- I BGK < YU`h\ "UbX GUZYmdc`]W]Yg/
- YI Ua ]bUh]cb dfcWXi fYg/
- gdYWJU``Wcbg]XYfUhJcb`]b`h\Y`Yj YbhcZ]``bYgg'cf'a ]gUXj Ybh fY/
- gh XYbhYei ]hmUbX X]gUV]`]hm/
- UbX'ch\Yf'YggYbhJU`'UWUXYa ]W]bZcfa UhJcbž'gYY

\hdg.#k k k "Uffig"i bgk "YXi "Ui #W ffYbhghi XYbhg#UWUXYa ]W]bZcfa Uhlcb#dfchcWc`g![i]XY`]bYg#