

# **SRAP5021**

 $\label{eq:continuous} Dc`] Whž'5Xj cWUWhUbX'5Whjj ]ga ']b'h\Y'8][]hU`'5[Y$ 

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

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

### <sup>'</sup>GhJZ'7cbhJWh'8YhJ]`g'

'7cbj Ybcfg'

B Ua Y	9a U]`	5j U]`UV]`] <b>m</b>	@cWUh]cb	D\cbY
8Uj ]X <sup>.</sup> 7 cca Vg	XUj ]X"Wca Vg4 i bgk "YXi "Ui		A cfj Yb 6fck bž ‰&ž &\$- ž cf &&%	

#### GWXcc``7cbHJWh'±bZcfa Uh]cb

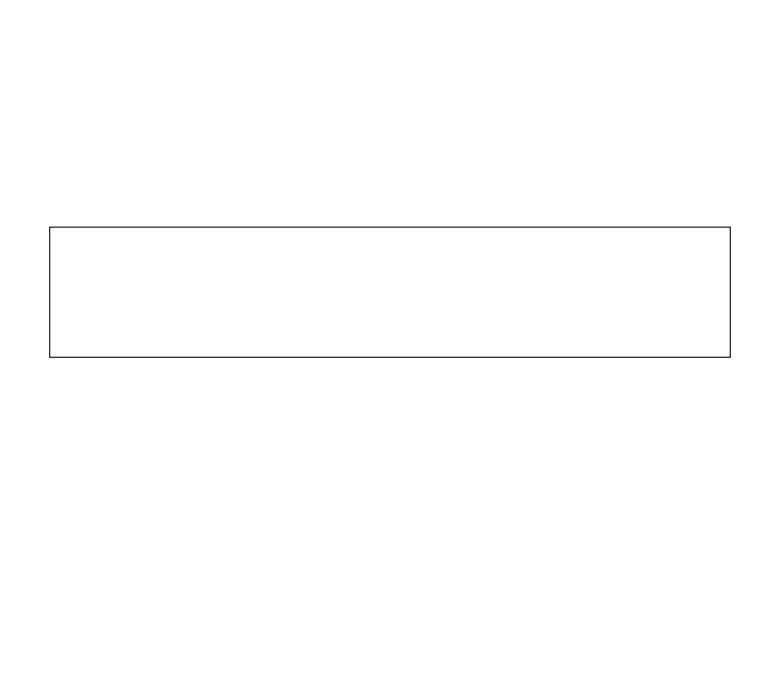
GWXcc``cZGcWJU``GWJYbWYg

Fcca '%) -

A cfj Yb 6fck b 7 &\$

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

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



 $\label{thm:locality:locality:bound} $H \Upsilon '' = (fci d'W ' a dcb Ybh' 'h '] g' U g (fci d'W ' a dcb Ybh' h 'g' U g (fci d'W '$ 

 $\label{thm:conditional} \begin{tabular}{ll} Hi fb]h]b gYhh]b[. H\]g Ugg][ba Ybh]g gi Va]hhYX hAfci [\Thi fb]h]b UbX ghi XYbhg WUb gYY Hi fb]h]b g]a] Uf]hm fYdcfhg"\\ \end{tabular}$ 

### 5 https://bxubwww.Fyei ]fya Ybhg

 $\hbox{Ghi XYbhg'UfY'ghfcb[`m'YbWc'i fU[YX'hc'UhhYbX'U```WUggYg'UbX'fYj]Yk'``YWhi fY'fYWcfX]b[g''' } \\$ 

## 7ci fgY'GWXYXi `Y

### <u>J]Yk 'WUgg'hja YHUV'Y</u>

### H]a YtUV`Y

8 UHY	HmdY	7 cbMbh
K YY_'%'%+': YVfi Ufm!'&% : YVfi Ufm	GYa ]bUf	K \Uhi]gʻUXj cWUWm3ʻK \Uhi]gʻUWnji ]ga 3ʻK \Uhi]gʻY! UWnji ]ga 3
		<pre>&lt; ck 'Xc'UXj cWUWnUbX'UWnjj ]ga ']bZi YbWY'dc`]Wn WXUb[ Y3'&lt; ck 'Xc'k Y'X]gh]b[ i ]g\'VYhk YYb'X][ ]hU` UXj cWUWnUbX'ch\Yf'Zcfa g'cZ]bZi YbWY'gi WX'Ug `cVVm]b[ 3'&lt; ck ']g']h`]b_YX'hc'Wca a i b]hm cf[ Ub]g]b[ 3'</pre>
	Cb`]bY`5W¶j]hm	7 ca d`YhY`U`X][ ]hU``g_]``g`]bj Ybhcfmhc`UggYgg`mci f ck b`X][ ]hU``g_]``g"`
K YY_'&.'&( ': YVfi Ufm!'&, : YVfi Ufm	GYa ]bUf	H\Y`dc`]WmdfcWYggžZfUa]b[`h\Y`]ggiYžgYh]b[ h\Y`U[YbXU`UbX`WUadU][b`[cU`g
		7 c`YVUHW.'g`WcbWdhi U``ZTUa Yk cf_`cZh\Y`dc`]WmdfcWgg`]g`]bHcXi WYX"`H\Y`WcbWdhcZfjggi YZTUa ]b[fi]g`U`gc`Yl d`U]bYX`]b`fY`UHjcb`hc`\ckdfcV`Ya g`a U_Y`]hcbhc`h\Y`dc`]WmU[YbXU"`H\Y]bZi YbW`cZh\Y`a YX]U`]b`h\]g`dfcWfgg`]g`U`gc Yl Ua ]bYX"
K YY_" ."&"A UfVX"!"* A UfVX	GYa ]bUf	; i Ygh`YWi fY
	C b`]bY`5Wfj]hm	Y!UXj cWUWmhcc`g
		91 Ua ]bUh]cb cZY!UXj cWUWnitcc`g UbX th\Y]f Udd`]WUh]cb"
K YY_'(.'-'A UfWX'!'% A UfWX	GYa ]bUf	GHJ_Y\c`XYfgž]bHYfYgh[fcidgž]bg]XYfg#cihg]XYfgžUbX'bYhkcf_g  5bU`mg]g'cZX]ZZYfYbhUWcfg'UbX'h\Y]f'fc`Yg'Vch\']b fY`Uh]cb'hc'h\Y'UXj cWUWmWJadU][b'UbX'h\Y'dc`]Wh dfcWYgg"'→Ybh]ZmgHJ_Y\c`XYfg'k]h\'h\Y'dckYf'hc \Y`d'cf'\]bXYf'h\Y'WJadU][b"'
K YY_^).^%*^A UfWX^!^&\$ A UfWX	GYa ]bUf	HY``]b[ 'h\Y'ghcfmUbX'a U_]b[ 'h\Y'bYk g
		7 fUZn]b[ 'h\Y'ghcfmhc'[ U]b'Wcblfc``cZh\Y'U[ YbXU" 5bU`mg]g'cZXca ]bUbhighcf]Yg']b'mci f'WkcgYb WJa dU][ b'gdUWY'UbX'WfUZn]b[ 'mci f'ghcfm' 7 cbg]XYfUh]cb'cZcb`]bY'j g'cZZ]bY'WJa dU][ b

		ghfuhr[]rg·ubx·huwjwg"
K YY**.*&' ^A UfVX^!*&+ A UfVX	GYa ]bUf	I gY`cZYj ]XYbW
		Ig]b[`UbX`dfYgYbh]b[`Yj]XYbWY`Zcf`dc`]WhiWXUb[Y" 9jU`iUh]b[`gcW]U``aYX]U`Ug`U`gcifWY`cZYj]XYbWY"`
K YY_`+.'' \$`A UfWX`!'' 5df]`	GYa ]bUf	5 Whjj ]ga ž:WmVYfUWhjj ]ga ž:g`UWhjj ]ga ž:UbX W]W_hjj ]ga /:Uk UfYbYggža cV]`]nUhjcb:UbX fYUWhjcb
		<pre>&lt; ck 'YZYWfj Y']g'X][]hU``UXj cWUWnUbX'UWfj ]ga Wca dUfYX'hc'cZZ]bY'ghfUhY[]Yg3'<ck 'xc'k="" cv]`]ny="" ddcfhyfg3<="" gi="" pre="" y'a=""></ck></pre>
K YY_', . '* '5df]`'! '%\$ '5df]`	GYa ]bUf	HfUbgbUhjcbU`5XjcWUWm
		5 W]hw`YI Ua ]bUhcb'cZhUbgbUhcbU`UXj cWJWm UbX'\ck ``cWJ``UWcfg'WJb'VY'X]gYa dck YfYX'UbX ci hwa Yg'Wa dfca ]gYX'Zfca 'ci hg]XY"
K YY_''% '5df]`'!'%+ 5df]`	GYa ]bUf	6`UW_`@]jYg`AUHHYf`#±bX][Ybcig`8YUh\g`]b 7ighcXm
		91 d`cfUh]cb`cZh\Y`]bhYfgYWf]cbg`VYhk YYb`dfchYgh a cj Ya Ybhg`U[ U]bgh'dc`]WY`j ]c`YbWY`]b`h\Y`l G`UbX 5i ghfU`]U"
K YY_"%\$."&\$"5df]`"!"&( 5df]`	GYa ]bUf	GUi ``5`]b_gmg'Fi `Yg'Zcf'FUX]WU`g

FYgci fW/g

#### 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]XYbhU`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 cdm]b[.'i g]b['h\Y'gUa Y'cf'j Yfmg]a]`Uf'k cfXg'hc'h\Y'cf][]bU`hYl hcf']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'dfcYWgž'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[...7\Ub[]b[...7\Ub[]b[...7\Ub[]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub[]b]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b[...7\Ub]b]b[...7\Ub]b[.

7 c``i g]cb.'k cf\_jb['k]h\ch\Yfg'Vi hdUgg]b['cZZh\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'cZh\Ya d`U[]Uf]g]b['UhiUbmh]a Yž'dUm]b['Ubch\Yf'dYfgcb'hc'dYfZcfa 'Ub'UWUXYa ]WhUg\_ž'ghYU']b['cf'UWei]f]b[ Ubch\Yf'dYfgcb'g'UWUXYa ]Wk cf\_'UbX'Wcdm]b[']hz'cZYf]b['hc'Wca d'YhY'Ubch\Yf'dYfgcb'g'k cf\_'cf'gYY\_]b[ dUma YbhZcf'Wca d'Yh]b['UWUXYa ]Wk cf\_"

±bUddfcdf]UhY`W]hUh]cb.`7]h]b[`gcifWrg`k\]W\`\UjY`bchVYYb`fYUXžk]h\cihUW\_bck`YX[]b[`h\Y`″gYWcbXUfm″gcifWrZfca`k\]W\`\_bck`YX[Y`cZh\Ya`\Ug`VYYb`cVhU]bYX"

8 i d`]\WUh]cb`ffgY`Zd`U[]\Uf]ga "Ł gi Va]\h]b[`mci f`ck b`k cf\_ž]b`k \c`Y`cf`]b`dUfhžk \YfY`]h\Ug`dfYj]ci g`m VYYb`dfYdUfYX`cf`gi Va]\hYX`Zcf`Ubch\Yf`UggYgga Ybhcf\Wci fgY`UhI BGK `cf`Ubch\Yf`i b]j Yfg]\m'

7 cffYWnfYZYfYbW]b[ dfUWf]WYg.

- DUfUd\fug]b[ ž'gi a a Uf]g]b[ ž'YggUmk f]h]b[ 'UbX'h]a Y'a UbU[ Ya Ybh
- 5ddfcdf]UhY'i gY'cZUbX'Uhtf]Vi h]cb'Zcf'U'fUb[Y'cZa UhYf]U`g']bWi X]b['hYl hž']a U[Ygž'Zcfa i `UY'UbX WbWYdhg"

±0X]j ]Xi U``Ugg]ghUbWr`]g`Uj U]`UV`Y`cb`fYei YghZfca `H\Y`@YUfb]b[ `7 YbhfY`f\hd.#k k k "`Wi bgk "YXi "Ui #L" Ghi XYbhg`UfY`U`gc`fYa ]bXYX`h\UhWUfYZ ``ha Ya UbU[ Ya Ybh]g`Ub`]a dcfhUbhdUfhcZghi XmUbX`cbY`cZh\Y ]XYbh]Z]YX`WUi gYg`cZd`U[ ]Uf]ga `]g`dccf`h]a Y`a UbU[ Ya Ybh'`Ghi XYbhg`g\ci `X`U``ck `gi ZZ]W]Ybh'h]a Y`Zcf fYgYUfW\žXfUZn]b[ `UbX`dfcdYf`fYZYfYbW]b[ `cZgci fW\*g`]b`dfYdUf]b[ `U```UggYgga Ybh']hYa g"

IBGK "@]VfUfmU'gc'\Ug'h\Y'9@&9'hcc`'Uj U]`UV`Y'hc'Ugg]ghimci ik ]h\'mci f'ghi Xm'Uhi BGK "'9@&9']g XYg][bYX'hc']bhfcXi WY'bYk 'ghi XYbhg'hc'ghi Xm]b['Uhil BGK 'Vi h']h\Wb'U'gc'VY'U'[fYUhifYZfYg\Yf'Xi f]b['mci f ghi Xm'

7 ca d'Yhjb[ 'h\Y'9@&9'hi hcf]U`'UbX'ei ]n'k ]``'YbUV'Y'mci 'hc.

- UbU`mgY`hcd]\Mgž'd`Ub`fYgdcbgYg`UbX`cf[Ub]gY`fYgYUf\X\`Zcf`U\WJXYa]\Wkf]hjb[`UbX`ch\YfUggYggaYbhiHJg\_g
- YZZYWIJ Y`mUbX`YZZWYbh`mZbX`Uddfcdf]UhY`]bZcfa Uh]cb`gci fWg`UbX`Yj U`i UhY`fY`Yj UbWY`hc`mci f bYYXg
- i gY`UbX`a UbU[Y`]bZcfa Uh]cb`YZZYWf]jY`mihc`UVWca d`]g\`U`gdYW]Z]Wdi fdcgY

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