

# EDST5114

Ⓜj Ygh[ Uh]b[ 'Ⓜgi Yg']b'7 i ff]W`i a `UbX'5ggYgga Ybh

GYa YghYf'C.bY`##`&\$%



GWcc`cZ9XI wjhcb`##`I BGK ``5fhg`UbX`GcWU`GwYbWg

# 7 ci fgY`Cj Yfj JYk

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

'7 cbj Ybcfg`

B Ua Y	9a Uj`	5j Uj`UV]`]m	@cWUhc b	D\cbY
7 Ufc`HUmcf	YXi WUhc b4 i bgk "YXi "Ui	H67	GYgg]cbU`	D`YUgY`i gY Ya Uj`Ug UVcj Y

## GWcc`7 cbhUW'`bZcfa Uh]cb

GWcc`cZ9Xi WUhc b

5 fng`UbX`GcWU`GWYbWg

@Yj Y`%ž>c\`b` ; ccXgY`oi ]X]b[ `fi &\$Ł

H. Ž`\*%f&Ł`-` , )` %` ++

9. YXi WUhc b4 i bgk "YXi "Ui

K . YXi WUhc b"Ufngi bgk "YXi "Ui

## 5 hYbXUbW`F Yei ]fYa Ybhg

5XX]hc bU`GWcc`cZ9Xi WUhc b`UhYbXUbW`fYei ]fYa Ybhg

h]g`YI dYWYX`hUhUbmghi XYbhYbfc`YX`]b`Ub`98GH`Vci fgY`k ]h`hY`GWcc`cZ9Xi WUhc b`k ]`a U\_Y`U  
 Vci a ]ha Ybhic`hY]f`YUfb]b[ `UbX`UhYbX`U`WUggYg`]b`Z`k`YfY`Vci bH`bh]g`XY`]j YfYX`]b`U`ZUW`!h`!ZUW  
 a cXY`YI W`dh]b`W`fU]b`W`fW`a ghUbW`g`k`YfY`UVgYbW`]g`Xi Y`h`c`]`bYggž`a ]gUXj Ybh`fY`cf`i bZcfYgYYb  
 W`fW`a ghUbW`g`VYncbX`hY`g`h`XYbhg`Vci bfc`"5`a`]b]a`i`a`UhYbXUbW`fYei ]fYa YbhicZ, \$i` ]g`fYei ]fYX`Zcf  
 YUW`Vci fgY`"b`W`fU]b`W`fW`a ghUbW`g`z`U`gh`XYbhia`Uma ]gg`i`d`h`c`&\$i`cZU`Vci fgY`k ]h`ci hZcfa U`  
 Udd`]WUhc b`UbX`i`d`h`c`"i`cZU`Vci fgY`k ]h`Zcfa U`XcW`a YbhUhc b`fYbhj ]U`Ya U]`h`c`Vci fgY`Vci bYbcfŁ  
 dfcj ]X]b[ `U`h`Y`fYei ]fYa Ybhg`XYHU]YX`VY`ck`UfY`a`Yh`Gh`XYbhg`bcha`YYh]b[ `h`Y`UhYbXUbW`  
 fYei ]fYa Ybhg`ci h]bYX`UVcj Y`k ]`VY`Uk`UfYX`Ub`i`bgUhc]ZUW`c`fm: U]`fi` : Ł`Zcf`h`UhVci fgY`fY[ UfX`Ygg`cZ  
 hY]f`dYfZcfa UbW`]b`h`Y`UggYgga YbhUg`g`cf`ch`Yf`fYei ]fYa Ybhg`Zcf`h`Y`Vci fgY`"

: cfZ`f`h`Yf`]bZcfa Uh]cb`cb`9Xi WUhc b`Vci fgY`UhYbXUbW`fYei ]fYa Ybhg`ž`d`YUgY`fYZf`h`h`Y`fYgdYW]j Y  
98GH`A`ccX`Y`a`cXi`YfgŁ`"

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

5`gh`XYbhg`a`i`gha U\_Y`U`j`U`]X`UhY`a`dhUhU`U`UggYgga Ybhg`]b`cfXYf`h`c`dUgg`h`Y`Vci fgY`"

: cfYggYbh]U`gh`XYbh]bZcfa Uh]cb`fY`Uh]b[ `h`c`fYei Yg]g`Zcf`YI`h`bg]cb/fYj`JYk`cZa`Uf\_g/cWW`dUh]cbU`YU`h`  
 UbX`gUZf`m`YI`Ua`]bUh]cb`dfcW`Xi`fYg/gdYWU`Vci bg]XYfUh]cb`]b`h`Y`Yj`YbhicZ`]`bYgg`cf`a`]gUXj`Ybh`fY/  
 gh`XYbhYei ]hm`UbX`X]gUV]`]m`UbX`ch`Yf`YggYbh]U`UWUXYa ]W]bZcfa Uh]cbž  
 gYY`[\fhdg.##k.k"Ufng"i bgk "YXi "Ui #W ffYbhghi XYbhg#UWUXYa \]W\]bZcfa Uh\]cb#dfc hVci g! \[i \]XY`\]bYg#](#)

7 ci fgY'8YHJ]`g

7 fYX]h'Dc]bhg '\*`

Gi a a UfmcZh\Y'7 ci fgY

h'`h]g`Vci fgYžm

5i ghfU`]Ub`DfcZYgg]cbU` ; fUXi UhY`HYUW ]b[ `GHUbXUfXg

GHUbXUfX	8YgW]dhcb
%"&"(	@YUX`dfcW]ggYg`hc`Yj`U`i`UhY`h`Y`Y`ZYW]j`YbYgg`c`Z`h`U`W`]b[ `dfc[ fUa`g`i`g]b[ `fYgYUfW`UbX`k`cf`_`d`U`W`_`_`b`c`k` `Y`X[ `Y`U`V`c`i`h` \`c`k` `g`h` `X`Y`b`h`g` `Y`U`f`b`
%) ""	9j`U`i`UhY` `Y`U`f`b]b[ `UbX`h`Y`U`W`]b[ `dfc[ fUa`g`z`i`g]b[ `g`h` `X`Y`b`h`U`g`g`Y`g`g`a` `Y`b`h`X`U`h`z`h`U`h`U`f`Y` `X]Z`Y`f`Y`b`h]U`h`X` `Z`c`f`h`Y` `g`d`Y`W]Z`W`Y`U`f`b]b[ `b`Y`Y`X`g` `c`Z`g`h` `X`Y`b`h`g` `U`W`f`c`g`g` `h`Y` `Z` ` ` `f`U`b[ `Y` `c`Z` `U`V`]`h`Y`g`"
*"&"&	D`U`f`h]W]d`U`h`Y` `]b` `Y`U`f`b]b[ `h`c` `i` `d`X`U`h` ` ` _`b`c`k` ` `Y`X[ `Y` `U`b`X` `d`f`U`W]W` `z` `h`U`f[ `Y`h`X` `h`c` `dfcZYgg]cbU` `b`Y`Y`X`g` `U`b`X` `g`W` `c`c` ` `U`b`X` `#` `c`f` `g`m`g`h`Y`a` ` `d`f]`c`f]`h`Y`g`"
*"" ""	h]h]U`h` `U`b`X` `Y`b[ `U[ `Y` `]b` `dfcZYgg]cbU` `X]g`W` `g`g]c`b`g` `k` `]h` `W`c` `Y`U[ `i` `Y`g` `]b` `U` `f`U`b[ `Y` `c`Z`Z`c`f`i` `a` `g` `h`c` `Y`j` `U` `i` `U`h` `d`f`U`W]W` `X]f`Y`W` `X` `U`h]a` `d`f`c`j` `]b[ `dfcZYgg]cbU` ` ` _`b`c`k` ` `Y`X[ `Y` `U`b`X` `d`f`U`W]W` `z` `U`b`X` `h`Y` `Y`X`i` `W`h]c`b`U` ` `c`i` `h`W`c`a` `Y`g` `c`Z`g`h` `X`Y`b`h`g`"

# 5ggYgga Ybh

## 5ggYgga YbhHUg\_g

5ggYgga YbhHUg_g	K Y][ \h	Gh XYbh@YUfb]b[ Ci hWca Yg 5ggYggYX	5 #HG@DfcZYgg]cbU"; fUXi UHY HYUW]b[ 'GHUbXUfXg'5ggYggYX	8i Y 8UHY
F YZYW]cb'dUdYf'	( \$i	%ž	%&"( ž%) "" ž*"&"&ž"" ""	&' #&' #& \$% \$). \$\$ DA
5bU`m]W]dUdYf UbX'dfYgYbhU]cb'	* \$i	%ž&ž	%&"( ž%) "" ž*"&"&ž"" ""	\$+ #&' #& \$% \$). \$\$ DA

D`YUgY`fYZf`h`3gef`S`[S` B`da`W`ee`[a` S`^E`fS` V`Sd`Ve` X`ad`F`W`SUZ`W`e`cb`h`Y`d`f`Y`j`]ci`g`d`U`[`Y`

## 5ggYgga Ybh8YHU]`g

5ggYgga Ybh% F YZYW]cb'dUdYf

GHUfhXUHY. Bch5dd`]WV`Y

8YHU]`g. HUg\_`%`!`K` f]hY`b`fYZYW]cb`cb`h`Y`UW]b[ `Yi`dYf]YbW`]b`W`cb`h`Y`a`dcfUfmYXi`WU]cb`W`cb`h`Y`l`hg`" `@Yb[ `h`.  
&\$\$`\$`k`cfXg`E`i`U`]h`U]j`Y`UbX`ei`Ubh]h`U]j`Y`ZYXVUW`\_`k`]h`]b`%\$`XUm]g`cZgi`Va`]gg]cb"

Hi`fb]h]b`g`YH]b[ .`h\]g`Ugg][`ba`Ybh]g`gi`Va`]hYX`h`fci`[`\`Hi`fb]h]b`UbX`gh`XYbtg`Xc`bchgYY`Hi`fb]h]b`  
g]a`]Uf]mifYdcf]g"

5ggYgga Ybh&. 5bU`m]W]dUdYf`UbX`dfYgYbhU]cb

GHUfhXUHY. Bch5dd`]WV`Y

8YHU]`g. HUg\_`&`!`K` f]hY`b`UbU`mg]g`UbX`dfYgYbhU]cb`cZU`g][`b]Z]W]bh]gg]i`Y`fY`UHY`X`h`c`W`ff]W`i`a`ž`UbX`#`f`  
UggYgga`Ybh`ž`UbX`#`f`fYdcf]b[ `h`U]h]g`cZ]bhYfYgh]c`mci`@Yb[ `h`.(`\$\$`\$`k`cfXg`fk`f]hY`b`dUdYf]h]a`Y.`) `a`]bi`hYg`  
fdYgYbhU]cb]E`i`U`]h`U]j`Y`UbX`ei`Ubh]h`U]j`Y`ZYXVUW`\_`k`]h`]b`%\$`XUm]g`cZgi`Va`]gg]cb"

Hi`fb]h]b`g`YH]b[ .`h\]g`Ugg][`ba`Ybh]g`gi`Va`]hYX`h`fci`[`\`Hi`fb]h]b`UbX`gh`XYbtg`Xc`bchgYY`Hi`fb]h]b`  
g]a`]Uf]mifYdcf]g"

Gi Va ]gg]cb :cZ5ggYgga YbhHUg\_g

Gh XYbng'UfY'YI dYW'X'hc'di h'Y]f'bUa Yg'UbX'gh XYbhbi a VYfg'cb'Yj YfmdU[ Y'cZ'Y]f'Ugg][ ba Ybhg"

Hi fb]h]b'Gi Va ]gg]cb

Znci 'YbWci bhYf'U'dfcV'Ya 'k \Yb'U'Y'a dh]b[ 'hc'gi Va ]hnci f'Ugg][ ba Ybh'fci [ \ 'Hi fb]h]b'z'd'YUgY  
h'Yd\cbY'9I h'fbU'Gi ddcfhcb'-' , ) ' ' ' %cf'Ya U] 'h'Ya 'cb' [YI h'fbU'h'gi ddcfh i bgk "YXi "Ui."](#) Gi ddcfh

f`G][ b]Z]WbhmUZZYWhmci f`dYfZcfa UbWV`]b`UggYggUV`Y`k cf\_žVY`]hU`Zcfa U`YbX!cZgYa YghYf`YI Ua ]bUh]cbžU  
WUgg`hYghž`U`UVcfUhc fmi`hYghž`U`gYa ]bUf`dfYgYbUh]cb`cf`Ubmich`Yf`Zcfa`cZUggYgga`Ybh`

: cf`Z`fh`Yf`XYhU]`g`]b`fY`Uh]cb`hc`GdYWU`7`cbg]XYfUh]cb`]bWi`X]b[``K`Yb`hc`5dd`mž`<`ck`hc`5dd`m`UbX  
`Gi`ddcfh]b[`8`cW`a`YbUh]cb`d`YUgY`fYZYf`hc`h`Y`GdYWU`7`cbg]XYfUh]cb`k`YVgh]Y.`

[\hdg.#gh`XYbhi`bgk`YXi`Ui`#gdYWU`!Wcbg\]XYfUh\]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" `hWUb`hU`Y`a`Ubm`Z`fa`g`z`Z`ca`'XY`]VYfU`h`W`X`U`h]b[ 'h`U`W`X`Y`b`U`m`W`d`m]b[ 'Z`ca`'U`g`ci`f`W`k`]h`ci`h`U`W`\_`b`c`k`'Y`X`[`Y`a`Y`b`h`

I BGK` ]`f`ci`d`g`d`U`[ ]Uf]ga` ]b`h`'h`Y`'Z`c`k`]b[ 'W`U`h`[`c`f]Y`g`.

7`c`d`m]b[.`i`g]b[ 'h`Y`'g`U`a`Y`'c`f`j`Y`f`m`g]a` ]U`f`k`c`f`X`g`'h`c`'h`Y`'c`f][ ]b`U`'h`i`h`c`f`]X`Y`U`'k`]h`ci`h`U`W`\_`b`c`k`'Y`X`[ ]b[ 'h`Y`g`ci`f`W`'c`f`i`g]b[ 'ei`c`h`U`h`c`b`'a`U`f`\_`g`" `H`[`g`'U`g`c`'U`d`d`]Y`g`'h`c`'j`a`U`[`Y`g`z`U`f`h`U`b`X`'X`Y`g][`b`'d`f`c`'Y`W`g`z`U`g`'k`Y`'U`g`d`f`Y`g`Y`b`h`U`h`c`b`g`'k`'Y`f`Y`'g`c`a`Y`c`b`Y`d`f`Y`g`Y`b`h`g`'U`b`c`h`Y`f`g`' ]X`Y`U`g`'c`f`k`c`f`X`g`'k`]h`ci`h`W`Y`X`]h`

h`U`d`d`f`c`d`f]U`h`'d`U`f`U`d`f`U`g]b[.`'W`X`U`b`[ ]b[ 'U`Z`Y`k`c`f`X`g`'U`b`X`'d`f`U`g`Y`g`'k`'Y`'a`c`g`h`m`f`Y`h`U]b]b[ 'h`Y`'c`f][ ]b`U`g`f`i`W`i`f`Y`'U`b`X`'j`b`Z`f`a`U`h`c`b`'k`]h`ci`h`U`W`\_`b`c`k`'Y`X`[`Y`a`Y`b`h`'H`[`g`'U`g`c`'U`d`d`]Y`g`]b`d`f`Y`g`Y`b`h`U`h`c`b`g`'k`'Y`f`Y`'g`c`a`Y`c`b`Y`d`U`f`U`d`f`U`g`Y`g`'U`b`c`h`Y`f`g`' ]X`Y`U`g`'c`f`k`c`f`X`g`'k`]h`ci`h`W`Y`X`]h`'h`U`g`c`'U`d`d`]Y`g`'h`c`'d`]Y`W`]b[ 'h`c`[`Y`h`Y`f`'ei`c`h`Y`g`'U`b`X`d`U`f`U`d`f`U`g`Y`g`]b`h`c`'U`'b`Y`k`'k`'c`'Y`z`k`]h`ci`h`f`Y`Z`Y`f`Y`b`W]b[ 'U`b`X`'U`'g`h`'X`Y`b`h`g`'c`k`b`'U`b`U`m`g]g`'h`c`'V`f]b[ 'h`Y`'a`'U`h`f]U`'h`c`[`Y`h`Y`f`"

7`c`'i`g]c`b.`k`c`f`\_`]b[ 'k`]h`c`h`Y`f`g`'Vi`h`d`U`g]b[ 'c`Z`h`Y`k`c`f`\_`U`g`'U`d`Y`f`g`c`b`'g`]b`X`]j`]Xi`U`'k`c`f`\_"`7`c`'i`g]c`b`U`g`c`]b`Wi`X`Y`g`d`f`c`j`]X]b[ 'm`ci`f`k`c`f`\_`'h`c`'U`b`c`h`Y`f`g`h`'X`Y`b`h`V`Y`Z`c`f`Y`'h`Y`'Xi`Y`'X`U`h`z`c`f`Z`c`f`'h`Y`'di`f`d`c`g`Y`'c`Z`h`Y`a`d`U`[ ]Uf]g]b[ 'U`h`U`b`m`h`j`a`Y`z`d`U`m]b[ 'U`b`c`h`Y`f`d`Y`f`g`c`b`'h`c`'d`Y`f`Z`c`f`a`'U`b`'U`W`X`Y`a` ]W`h`U`g`\_`z`g`h`U`'b[ 'c`f`U`W`e`i` ]f]b[ 'U`b`c`h`Y`f`d`Y`f`g`c`b`'g`'U`W`X`Y`a` ]W`k`c`f`\_`'U`b`X`'W`e`d`m]b[ ]h`z`c`Z`Y`f]b[ 'h`c`'W`e`a`d`'Y`h`'U`b`c`h`Y`f`d`Y`f`g`c`b`'g`'k`c`f`\_`c`f`g`Y`Y`\_]b[ d`U`m`a`Y`b`h`Z`c`f`W`e`a`d`'Y`h]b[ 'U`W`X`Y`a` ]W`k`c`f`\_"

h`U`d`d`f`c`d`f]U`h`'W`h`U`h`c`b.`7`]h]b[ 'g`ci`f`W`g`'k`'W`X`'U`j`Y`'b`c`h`V`Y`Y`b`'f`Y`U`X`z`k`]h`ci`h`U`W`\_`b`c`k`'Y`X`[ ]b[ 'h`Y`'g`Y`W`e`b`X`U`f`m`'g`ci`f`W`'Z`c`a`'k`'W`X`\_`b`c`k`'Y`X`[`Y`'c`Z`h`Y`a`'`U`g`'V`Y`Y`b`'c`V`h`U]b`Y`X`"

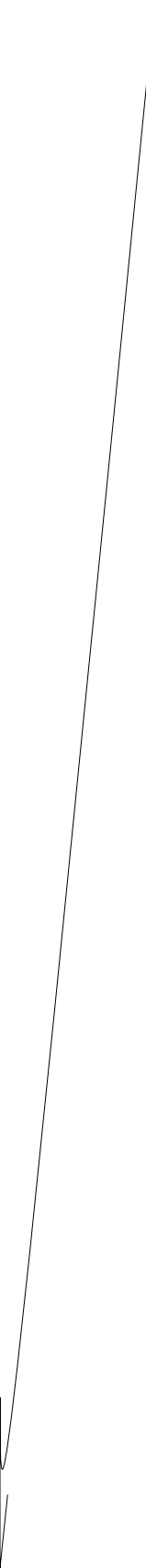
8`i`d`]W`U`h`c`b`'f`f`g`Y`Z`d`U`[ ]Uf]ga` "E`'gi`Va` ]h]b[ 'm`ci`f`k`b`'k`c`f`\_`z`]b`'k`'c`'Y`'c`f`]b`d`U`f`h`z`k`'Y`f`Y`'h`'U`g`d`f`Y`j`]c`i`g`m`V`Y`Y`b`d`f`Y`d`U`f`Y`X`'c`f`g`i`Va` ]h`Y`X`'Z`c`f`'U`b`c`h`Y`f`'U`g`g`Y`g`g`a`Y`b`h`c`f`'W`e`i`f`g`Y`'U`h`I`BGK`'c`f`'U`b`c`h`Y`f`i`b`j`Y`f`g]h`m`"

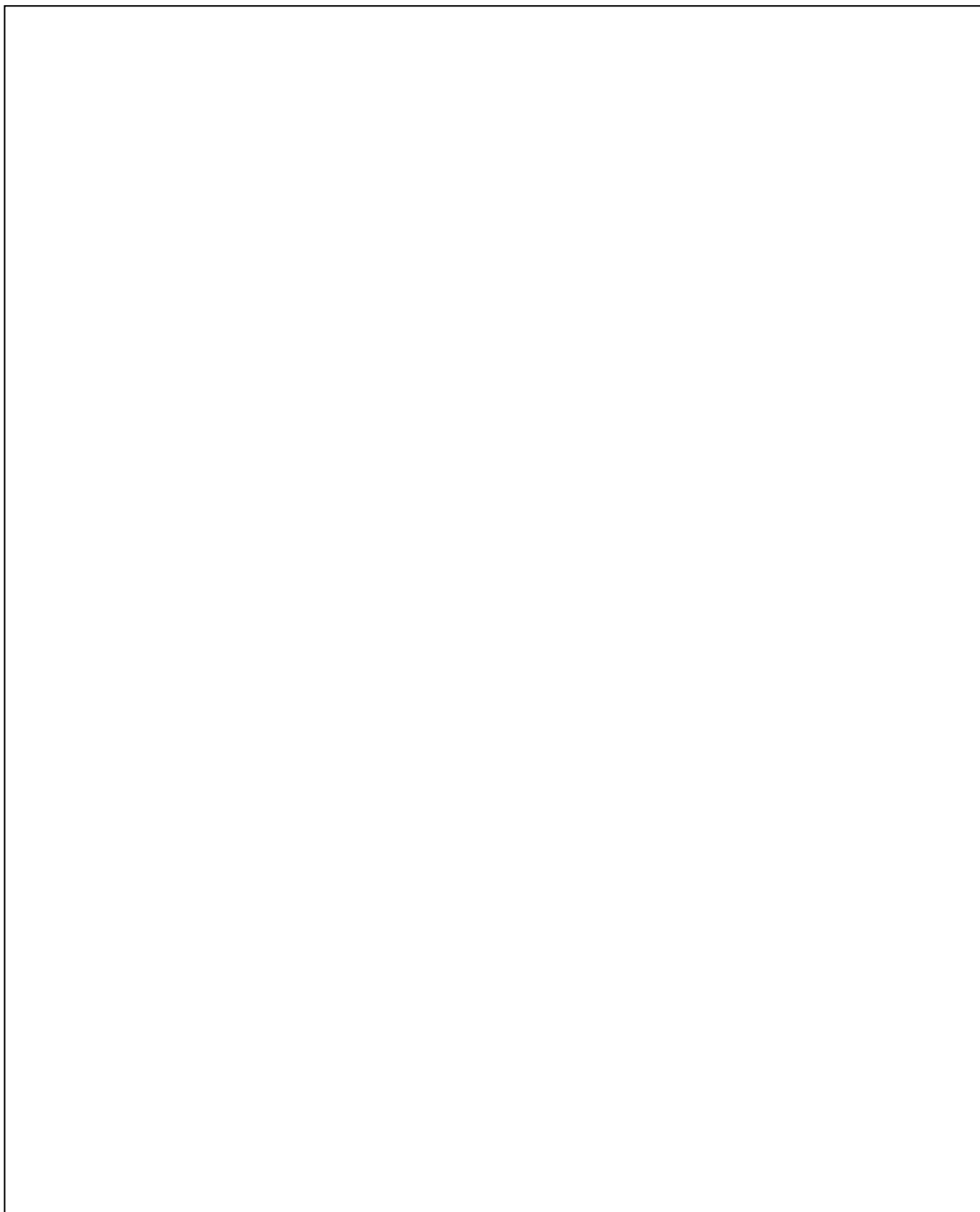
7`c`f`f`Y`W`h`f`Y`Z`Y`f`Y`b`W]b[ 'd`f`U`W`h`W`g`.

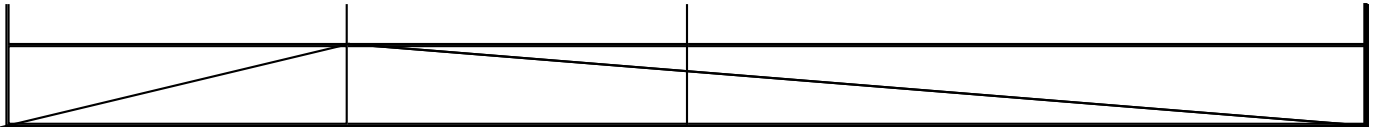
- D`U`f`U`d`f`U`g]b[ 'z`g`i`a`a`U`f]g]b[ 'z`Y`g`g`U`m`k`f`]h]b[ 'U`b`X`'h`j`a`Y`'a`U`b`U`[`Y`a`Y`b`h`
-



- VYhYf'a UbU[ Y'mci f'hja Y
- i bXYfgHUbX'mci f'f][ \hg'UbX'fYgdcbg]V]hYg'Ug'U'gh XYbhUhl BGK
- VY'Uk UfY'cZd'U[ ]Uf]ga ž'Wcdf][ \hž' BGK 'Gh XYbh7cXY'cZ7cbXi WñUbX'5WwdfUV'Y'l gY'cZ  
I BGK '⇒H'F Ygci fW'g'Dc`]Wñ







F Ygci fWg

DfYgW]VYX`F Ygci fWg`

D`YUgY`gYY`A ccX`Y

F YWca a YbXYX`F Ygci fWg

D`YUgY`gYY`A ccX`Y

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