

### **EDST5440**

5Xj UbWYX H9GC@A Yh\cXc`c[m

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

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

### 7ci fgY 8YHJ] g

7 fYX]hDc]bhg\*\*

Giaa UfmcZh\Y 7ci fgY

±0.1h\]g.Wci fgY'mci [U]b.bYk 'cfi dXUhYX'g\_]``g']b.h\Y'gdYW]U`]ghiH9GC@Z]Y`X"'Mci 'Yb[U[Y'k]h\'UXj UbWYX `Ub[i U[Y'hYUW\]b[ 'a Yh\cXc`c[mUbX']hg'dfUW]WU``Udd`]WUh]cbg'h\fci [\'U'dfc[fUa 'cZgYa]bUfg'UbX'cb`]bY]bhYfUW]cbg"'Hcd]Wg'Wcj Yf'X]ZYfYbhUddfcUW\Yg'hc'9b[`]g\``Ub[i U[Y'`YUfb]b['UbX'hYUW\]b[ž']bWi X]b[YZYWf]j Y'hYUW\]b['ghfUhY[]Yg'UbX'hYW\b]ei Yg'Zcf'hYUW\]b['fYUX]b['z'k f]h]b['z`]ghYb]b['UbX'gdYU\_]b['z'a UhYf]U`g'XYj Y`cda Ybhz'UbX'h\Y'd`Ubb]b['UbX'Yj U`i Uh]cb'cZ]bX]j ]Xi U```Yggcbg'UbX'i b]hg'cZk cf\_"'H\Y'fc'Y

]b 'h\Y '\Z\YX'bYYX'hc 'WcbghUbhmfYZYWii dcb 'UbX'fY!Yj U'i UhY 'h\Y]f'i bXYfghUbX]b[ g'cZ`Ub[ i U[ Y'UbX \ck VYghhc 'h\UW\']h''H\Y 'Wci fgY 'h\ i g'U]a g'hc 'Wf]h\W\'mUbU`mgYz'fYj ]gY 'UbX'YI h\'bX'ghi XYbhg''i bXYfghUbX]b[ UbX'dfUW\\W cZh\Y 'WcfY'UddfcUW.Yg'UbX'h\W\b]ei Yg'cZH9GC@a Yh\cXc`c[ m''

# 5i ghfu`]Ub'DfcZYgg]cbU`; fUXi UhY'HYUWX]b['GhJbXUfXg

GKGKKKKKKK	8 YgWf]dh]cb	
&"%"%	8Ya cbglfUllY`_bck`YX[Y`UbX`i bXYfglUbX]b[`cZl\Y`WcbWldlgžgi VglUbWl`UbX`glfi Wi fYcZl\Y`WcblYbh'UbX`hYUW\]b[`glfUllY[]Yg`cZl\Y`lYUW\]b[`UfYU"	
&"%"	GiddcfhWc``YU[iYg`ig]MoW ffYbhUbX`WcaMbY\Ybg]jY`_bck`YX[Y`cZWcbhYbhWbX ‰hYUWX]b[`ghfUhY[]Yg`hc`XYjY`cd`UbX`]ad`YaYbhYb[U[]b[``YUfb]b[`UbX`hYUWX]b[	j Y ·
		-

Y \_bck

# 5ggYgga Ybh

### 5ggYgga Ybh'HUg\_g

5ggYgga Ybh'HJg_	K Y][ \h	Ghi XYbh'@YUfb]b[ Ci hWca Yg 5ggYggYX	5 +HG@*Dfc <b>524dg}@*Df6*2MG&amp;%jCbbUZYgfg]&amp;</b> HYUWX]b[*GHJbXUfXg*5ggYggYX	b <b>ur</b> ayi Youxi l 8 Uhy	UhY
8Yg][bˈcZU 8Yg]	[bcZU				

 $a \ \ UhYf]U"g"UbX"hUg\_g"Wk cgYbž"Ug"k Y```Ug"h\Y]f"gi \ ]hUV]"]hmZcf"h\Y'WcbhYl h']b"k \ \]Wk "mci "k ci "X"bcfa U``m hYUW,""fl $$$"k cfXgŁ$ 

 $\label{thm:conditional} \mbox{Hi fb]h]b$ "gYhh]b$ [. "H\]g$ "Ugg][ ba Ybh]g$ "gi Va ]hhYX$ "h\fci [\ \ 'Hi fb]h]b$ "UbX"ghi XYbhg$ "WUb"gYY$ "Hi fb]h]b$ "gJa ]$ `Uf]hm fYdcfhg$"$ 

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

Gh XYbhg UfY Yl dYWYX hc di hh\Y]f bUa Yg UbX gh XYbhbi a VYfg cb Yj YfmdU[Y cZh\Y]f Ugg][ ba Ybhg"

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

#mci YbWci bhYf'U'dfcV'Ya k \Yb'UhYa dhJo['hc'gi Va ]hmci f'Ugg][ ba Ybhh\fci [\'Hi fb]h]bž'd'YUgY
hY'Yd\cbY'9l hYfbU'Gi ddcfhcb'-', ) "''' %cf'Ya U]'h\Ya 'cb'<u>Yl hYfbU'hY'hgi ddcfh4 i bgk "YXi "Ui"</u>"'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]h]b'mci 'a Um'Udd'mZcf'Ub'Yl hYbg]cbž'Vi hmci
a i ghfYhJ]b'mci f'h]W\_Yhbi a VYf'Zfca '9l hYfbU''Gi ddcfhfU'cb['k]h\'Ubmch\Yf'fY'Yj UbhXcW a YbhgŁ'hc
]bWi XY'Ug'Yj ]XYbW'hc'gi ddcfhmci f'Yl hYbg]cb'Udd']WUh]cb"'#mci 'Ya U]''9l hYfbU''Gi ddcfhmci 'k]''
Ui hca Uh]WU''mfYWf']j Y'U'h]W\_Yhbi a VYfž'Vi h]Zmci 'hY'Yd\cbY'mci 'k]'''bYYX'hc'gdYW]ZJWU''mUg\_'Zcf'cbY"
Hi fb]h]b'U'gc'dfcj ]XYg'i dXUhYg'cb'h\Y]f'gmghYa 'ghUh' g'cb'Hk]hYf"

; YbYfU``mž'UggYgga YbhitUg\_g'a i ghVY'gi Va ]hhYX'Y`YWfcb]WU``mj ]U'Y]h\Yf'Hi fb]h]b'cf'U'A ccX`Y Ugg][ ba Ybh'' =b']bghUbWfg'k \YfY'h\]g']g'bchdcgg]V`Yž']hk ]```VY'ghUhYX'cb'mci f'Wci fgY'g'A ccX`Y'g]hY'k ]h\U`hYfbUh]j Y'gi Va ]gg]cb'XYhU]`g''

@UhY 5 ggYgga YbhDYbU`hJYg

ł `G][ b]Z]\WbhmUZZY\Wimci f`dYfZcfa Ub\Wr`]b`UggYggUV`Y`k cf\_ž`VY`]h'U`Zcfa U``YbX!cZgYa YghYf`Yl Ua ]bUh]cbž`U`\WUgg`hYghž`U``UVcfUhcfmihYghž`U`gYa ]bUf`dfYgYbhUh]cb`cf`Ubmch\Yf`Zcfa 'cZUggYgga Ybh'

#### 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"'\lefi\Wb'hU\_Y`a Ubm Zcfa gžZfca `XY`]VYfUhY`W\YUh]b[ 'hc`UVW]XYbhU`mWcdm]b[ 'Zfca `U`gci fW'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 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'

#JUddfcdf]UhY`dUfUd\fUg]b[.'W\Ub[]b['U'ZYk'k cfXg'UbX'd\fUgYg'k\]'Y`a cghmfYhU]b]b['h\Y`cf][]bU`ghi Whi fY`UbX']bZcfa Uh]cb`k]h\ci h'UW\_bck `YX[Ya Ybh''H\]g'U`gc'Udd`]Yg']b'dfYgYbhUh]cbg'k\YfY`gca YcbYdUfUd\fUgYg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci h'WfYX]h''#iU`gc'Udd`]Yg'hc'd]YW]b['hc[Yh\Yf'ei chYg'UbXdUfUd\fUgYg']bhc'U'bYk'k\c`Yž'k]h\ci h'fYZYfYbW]b['UbX'U'ghi XYbhg'ck b'UbU`mg]g'hc'Vf]b['h\Y'a UhYf]U`hc[Yh\Yf'

7 c``i g]cb. 'k cf\_]b[ 'k ]h\ 'ch\Yfg'Vi h'dUgg]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[ 'Uh'Ubmh]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[ˈgci fW/gˈk \]WX`\Uj Y`bchVYYb`fYUXžk]h\ci hUW\_bck`YX[]b[ˈh\Y`″gYWcbXUfm″gci fW/Zfca k \]WX\_bck`YX[Y`cZh\Ya`\Ug'VYYb`cVhU]bYX"

8 i d`]\WUh]cb`ff`gY`Zld`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`UqqYqqa Ybhcf\Wci fgY`UhI\_BGK\_`cf`Ubch\Yf`i b]\Yfq]\m"

7 cffYWhfYZYfYbWb[ dfUWhWyg.

• Dufud\fug]b[žgi a a Uf]g]b[žYggUmk f]h]b["UbX"h]a Y a UbU[Ya Ybh

•

- VYMYfa UbU[Ymcifh]a Y
- i bXYfgHJbX'mci f'f][ \hg'UbX'fYgdcbg]V]`]h]Yg'Ug'U'ghi XYbh'Uhi BGK
   VY'Uk UfY'cZd`U[ ]Uf]ga ž'Wcdmf][ \hž'I BGK 'Ghi XYbh'7cXY'cZ7cbXi Wh'UbX'5WWYdhJV`Y'I gY'cZ I BGK '= H'F Ygci fWfg'Dc`]Wh

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### FYgci fWfg

#### DfYgWf]VYX F Ygci fWYg

• 6i fbgž5"'UbX'F]WkUfXgž'>"'fPXgŁ"'&\$\%"FZW5S\_TqVYW9g[VWfaBWWSYaYkS`VBcSUf[UW[EWUa`V>S`YgSYWFWSUZ[`Yž7UaVf]X[Y.7UaVf]X[Y1b]jYfg]mmDfYgg"

#### FYWca a YbXYX FYgci fWYg

• 6UlrghcbYžF "'f% - (Ł"'9 dS\_ \_ SdžCl ZcfX. 'Cl ZcfX'l b]j Yfg]lmiDfYgg"

8 U`hcbž7 / 'GY]XY`\cZYfž6"'f% - , Ł'Bda` g` U[Sf[a` "'C | ZcfX.'C | ZcfX'| b]j Yfg]hmDfYgg

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