

# **SOCF5108**

H\YfUdYi hJW7cbhYl hg UbX F Y`UhJcbg\]dg

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

## 7ci fgY 8YHJ] g

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

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

H\]g`Z[fghWci fgY`cZh\Y`A UghYf`cZ7ci bgY``]b[`GcW]U``K cf\_'dfc[fUa `k]```]bhfcXi WY`mci `hc`h\Y`dUfUa YhYfg cZWcbhYl hUbX`fY`Uh]cbg\]d`]b`Wci bgY``]b[`UbX`Wcbg]XYf`h\Y`[YbYf]WgcW]U``k cf\_'cf]YbhUh]cb`hc`W]Ybhg' ghfYb[h\g`UbX`fYg]`]YbW\"'Mci `k]```Yl Ua ]bY`h\Y`]a dcfhUbW\cZh\Y`gdYW]Z]W]mmcZWcbhYl hg`cZh\YfUdmUbX WcbhYl hi U``UbX`dck Yf`]ggi Yg`]b`h\YfUdYi h]WfY`Uh]cbg\]dg\"Mci `k]```U`gc`Yb[U[Y`k]h\`]ggi Yg`]b`mci f`ck b dfUWn]WY`cZi gY`cZgY`ZYb[U[Ya YbhžYa dUh\mžWcbhU]ba YbhžUbX`Vci bXUf]Yg\"

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

%" 8 Ya cbglfUllY 'Uk UfYbYgg'cZU'i gY'cZgY`Z]b'Wci bgY``]b["

- &" 9Id`U]b`h\Y`YZZYWg`cZWcbhYIh`U``]ggi Yg`]b`h\Y`h\YfUdYih]WfY`Uh]cbg\]d
- '" ⇒XYbhJmubX`YI d`cfY`]ggi Yg`cZYb[U[Ya YbhžYa dUh\mžWcbhJ]ba YbhžUbX`Vci bXUf]Yg`k]h\]b`h\Y Wci bqY``cf!W]YbhfY`Uhcbq\]d
- $("8YjY`cd`gY`ZfYZYI]jY`dfUWf)WYg`k]h\ `UkUfYbYgg`cZgcW]U``UbX`W`hifU``X]jYfg]hmik]h\ ]b`h\ YWcibqY``]b[`fY`Uh]cbq\]d$

#### HYUWX]b[ GhfUhY[]Yg

## 5ggYgga Ybh

D`YUgY`bchYž'Z fh\Yf`]bZcfa Uh]cb`UVci hYUW\`UggYgga YbhHUg\_ž`]bWi X]b[``gdYW]Z]Whcd]WUfYUgžk]```VYdfcj]XYX`]b`U`gYdUfUhY`XcW a YbhUbX`dcghYX`cb`h\Y`A ccX`Y`dU[Y`Zcf`h\]g`Wci fgY"`

.

#### 5ggYgga Ybh'HUg\_g'

5ggYgga Ybh'hJg_	K Y][\h	8i Y'8UHY	Gh XYbh@YUfb]b[ Ci hWca Ygʻ5ggYggYX
FYZYW¶cb'YggUm	(\$1	&+#\$' #&\$% '%%) - 'DA	% <u>*</u> (
F YgYUfV% 'YggUm'	*\$1	\$%\$)#&\$% '%%) - 'DA	&ž

#### 5ggYgga Ybh8YHJ]`g

5ggYgga Ybh% FYZYWhcb YggUm

GhUfhXUhY. Bch5dd`]WUV`Y

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

8 YHU]`g. `Ghi XYbhg`k]```gi Va]hU`Wf]hJWU``fYZYWf]cb`d]YWY`fa Ul "'%) \$\$`k cfXgŁ`cb`U`cb`U`hcd]WfY`Yj Ubhihc`h\Y Wti fgY`a UhYf]U`"``Ghi XYbhg`k]```fYWY]j Y`k f]hhYb`ZYYXVUW\_`UbX`U`bi a Yf]WW`[ fUXY`k]h\]b`hYb`k cf\_]b[ `XUmg`cZgi Va]gg]cb"`H\Y`ZYYXVUW\_`g\YYh#fi Vf]Wk]```VY`Uj U]`UV`Y`hc`ghi XYbhg`Uhih\Y`ghUfhcZh\Y`Wti fgY`gc`h\Uhih\Ym WUb`k cf\_'hck UfXg`gdYWJZ]YX`ghUbXUfXg"``

Hi fb]h]b gYh]b[. 'H\]g Ugg][ ba Ybh]g gi Va ]h\X h\fci [\'Hi fb]h]b UbX ghi XYbhg WUb gYY 'Hi fb]h]b 'g]a ]`Uf]hm fYdcfhg"

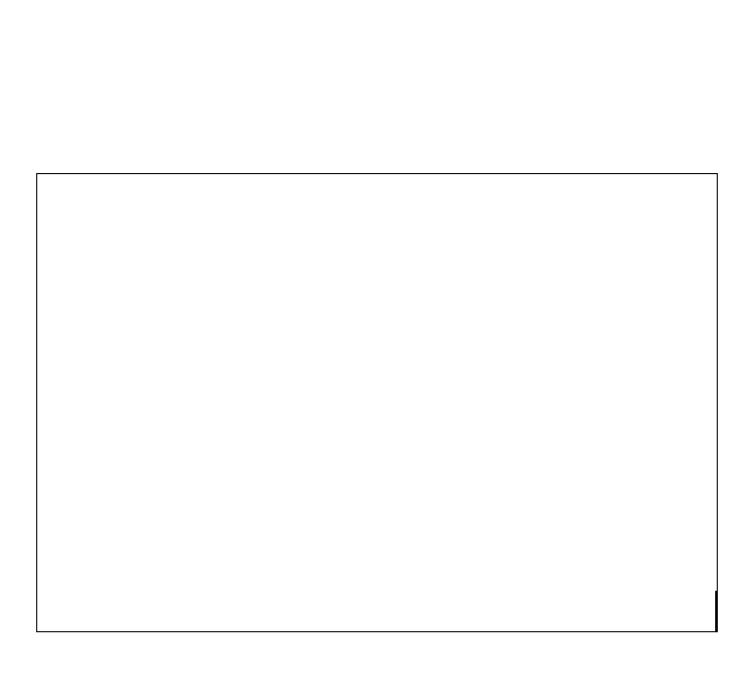
5ggYgga Ybh& FYgYUfWX YggUm

GhUfhXUhY. Bch5dd`]WUV`Y

@Yb[h\.'&ž)\$\$

8 YHU]`g. `Ghi XYbhg`k ]```gi Va ]h\U`fYgYUfW\`YggUmfa UI "`&) \$\$`k cfXgŁ'cb`U'hcd]WfY`Yj Ubhhc`h\Y`Wti fgY a UhYf]U`"`Ghi XYbhg`k ]```fYWY]j Y`k f]hhYb`ZYYXVUW\_`UbX`U'bi a Yf]WU``[ fUXY`k ]h\]b`hYb`k cf\_]b[ `XUmg`cZ gi Va ]gg]cb"`H\Y`ZYYXVUW\_`g\YYh#fi Vf]Wk ]```VY`Uj U]`UV`Y`hc`ghi XYbhg`Uhh\Y`gHJfhcZh\Y`Wti fgY`gc`h\Uhh\Ym WUb`k cf\_'hck UfXg`gdYW]ZYX`gHUbXUfXg"``H\]g`]g`h\Y`Z]bU``UggYgga YbhZcf`h\]g`Wti fgY"`

 $\label{thm:limit} \begin{tabular}{ll} Hi & fb \end{tabular} $$ Hi & fb \end{tabular} $$ h' \end{tabular} $$ I' \end{tabular} $$ Hi & fb \end{tabular} $$ h' \end{tabular} $$ I' \end{tab$ 



## FYgci fWyg

DfYgWf]VYX F Ygci fWYg

5``h\YWcfYUbXUXX]h]cbU`fYUX]b[gUfYUjU]`UV`YZfca@Y[UbhcUbXcb`]bY\iVZcfWcifgYaUhYf]U`g"MciWUbUWWgg@Y[UbhcUbXh\YWcifgYaUhYf]U`gVm`c[[]b[cbhch\YAccX`YdU[YZcfh\]gWcifgYk]h\mcifg]b[`Yg][bcbghXYbh`c[]b"

 $\underline{Mci} \ \ \underline{'a} \ \underline{i} \ \underline{ghfYUX.YUWX.cZh,Y.WcfY.fYUX]b[\ \underline{gdf]cfhc.WUgg.YUWX.k.YY....Mci} \ \ \underline{a} \ \underline{UmU.gc.k.}\underline{g}. \ \underline{hc.fYUX.h,Y.WcfY.fYUX]b[\ \underline{fgt...} } \underline{UmU.gc.k.}\underline{gdf]cfhc.WUgg.YUWX.k.YY....Mci \ \underline{'a} \ \underline{UmU.gc.k.}\underline{gd...}\underline{fgt...} \underline{fgt...} \underline{''.Mci \ \underline{'a} \ \underline{UmU.gc.k.}\underline{gdf}.\underline{fgt...} } \underline{''.Mci \ \underline{''.Mci \ \underline{'a} \ \underline{UmU.gc.k.}\underline{gdf}.\underline{fgt...} } \underline{''.Mci \ \underline{''$ 

#### FYWca a YbXYX FYgci fWyg

Mci 'WUb'g][b'i d'Zcf'HUV'Y'cZ7cbh/bhg'fHC7Ł5'Yfhg'Zfca 'h\Y'\ca YdU[Yg'cZfY'Yj Ubh'ĉi fbU'gž'hc'fYWY]j Y Ub'Ya U]`'k \YbYj Yf'bYk 'Ufh]WYg'UfY'di V']g\YX']b'h\Uh'ĉi fbU'"'>ci fbU'"'>ci fbU'''>ci fbU'''
lbZcfa Uh]cb'cb'h\Y'a cghij ]Yk YX'UbX'a cgh'WhYX'Ufh]WYg/h\YgY'UfY'`]\_Y'mhc'VY']bhYfYgh]b['UbX'cZhYb]bZi Ybh]U`'Wcbhf]Vi h]cbg''; cc['Y'GW\c'Uf'k]`''U'gc'dc]bh'mci 'hc'Ufh]WYg'h\Uh'\Uj Y'WhYX'U'dUfh]W' `Uf'Ufh]WYUbX'\YbW''k]`''VY'fY'UhYX'hc'h\Y'hcd]W''

@]b\_g`hc`UXX]h]cbU``fYgci fWygži ]XcYg`UbX`hYI hg`k]```VY`X]gWiggYX`]b`WUgg"

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

Gi Va ]gg]cb cZ5ggYgga YbhHUg\_g

Gi Va ]gg]cb cZ5ggYgga YbhHUg\_g

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

Image: Ybwci bhYf'U'dfcV'Ya k \Yb'UhYa dhJb[ 'hc'gi Va ]hmci f'Ugg][ ba Ybht\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" Image:

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]cbž'Vi hmci
a i ghfYhJ]b'mci f'hJW\_Yhbi a VYf'Zfca '9! hYfbU''Gi ddcfhfU'cb[ 'k ]h\ 'Ubmch\Yf'fY'Yj UbhXcW a YbhgŁ'hc
]bWi XY'Ug'Yj ]XYbW' 'hc'gi ddcfhmci f'Y! hYbg]cb'Udd']WUh]cb" Image: Ya U]''9! hYfbU''Gi ddcfhmci 'k ]''

Ui hca UhJWJ''mfYW'] Y'U'hJW\_Yhbi a VYfž'Vi h]Zmci 'hY'Yd\cbY'mci 'k ]'''bYYX'hc'gdYWJZWJ''mUg\_'Zcf'cbY"

Hi fb]hJb'U'gc'dfcj ]XYg'i dXUhYg'cb'h\Y]f'gmghYa 'ghUh' g'cb'Hk ]hYf"

; YbYfU``mž'UggYgga YbhiHug\_g'a i ghVY'gi Va ]hhYX'Y`YVWfcb]\W)``mj ]U'Y]h\Yf'Hi fb]hjb'cf'U'A ccX`Y Ugg][ ba Ybh'' =b']bgHJb\W'g'k \YfY'h\]g']g'bchdcgg]V`Yž']hk ]``'VY'gHJhYX'cb'mci f'\\circ i fgY'g'A ccX`Y'g]hY'k ]h\ U`hYfbUhj Y'gi Va ]gg]cb'XYHJ]`g''

cfi]bZcfa Uh]cbicbi\ckihcigi Va ]hUgg][ ba Ybhgicbi]bYij ]UiA ccXiY.i\hdg.#gh XYbh'i bgk "YXi "Ui #\ck! qi Va ]hUgq][ ba Ybha ccXiY

## $5\,WUXYa\,W< cbYghmUbXDU[\,Uf]ga$

D`U[]Uf]ga i]gii g]b[ih\Yik cfXgicfi]XYUgicZch\YfgiUbXidfYgYbh]b[ih\Ya iUgimci fick b"i=iWUbiHU\_Yia Ubm Zcfa gžZfca iXYi]VYfUhYiWXYUh]b[ihciUWW]XYbhU`mWcdm]b[iZfca iUigci fWYik]h\ci hiUW\_bck iYX[Ya Ybh'i

• i bXYfgHJbX'mci f'f][\hg'UbX'fYgdcbg]V]`]h]Yg'Ug'U'gh XYbh'Uhil BGK

#### 5WUXYa]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'GUZYhm'dc`]W[Yg/
- YI Ua ]bUh]cb dfcW/Xi fYg/
- gdYWJU``Wcbg]XYfUhJcb`]b`h\Y`Yj YbhcZ]``bYgg'cf'a ]gUXj Ybhi fY/
- gh XYbhYei ]hmUbX X]gUV]`]hm/
- ÜbX'ch\Yf'YggYbhJU`'UWUXYa ]W]bZcfa UhJcbž'gYY

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

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