

### A Uf\_hUbU`mgY`&\$&'.`6G9`GYbgYl`\_Àa dZh [Y[Yb`Ub\U`hYbXY`Jc`Uh]`]hÀh

5a '&) "' $\Rightarrow$  `]'YfÒZZbYhY'XYf'6G9'GYbgYl '' \$'a ]h'Y]bYa FØW\_[ Ub[ 'j cb'\$ž\* \* 'ı 'Ui Z'+- "\* %+ž- ) 'Di b\_hYž'bUWX'ZØbZ bY[ Uh]j Yb' < UbXY`ghU[ Yb"

## 8 Yf'9]b Z`i gg'X Yf'6 ÒfgYbj c`Uh]`]hÀh'Ui Z'X]Y 5 b`Y[ Yf[ Ya Y]bgW\UZh

 $8 ]Y `U\_hi Y``Yb `9fY][ b]ggY `Ub `XYb `: ]bUbna Åf\_hYb `g]bX `b]W\h'bi f Y]bZUW\Y `NU\ `Yb `Ui Z'Y]bYa `6]`XgW\]fa /'g]Y `gd]Y[ Y`b `XUg J YfhfUi Yb `i bX `X]Y `Gh]a a i b[ `XYf `5b`Y[ Yf `k ]XYf" `8 Yf `6G9 `GYbgYI '$ `Yf`YVhY `Ua `&) " `$ `]`&$&' `Y]bYb `F ØW_[ Ub[ `j cb `$ž* * ı `i bX `Z]Y` Ui Z'+- "* %+ž- ) `Di b_hY " `8]Yg `]gh`XYf `ZØbZhY `Ui ZY]bUbXYfZc`[ YbXY < UbXY`ghU[ ž`Ub `XYa `XYf \ddot XYI `bY[ Uh]j Y`K YfhY `nY][ hž`k Ug`g]W\ `U`g U`Ufa ]YfYbXYg `G][ bU``ZØf X]Y `5b`Y[ Yf Yfk Y]gYb `_ObbhY"$ 

#### @Ub[Zf]gh][Y HfYbXg]a : c\_i g

 $\label{thm:converse} Hfchn: XYf' @b[ghYb'JYf'ighY' \ Uh'XYf'6G9'GYbgYl'' \$'bcW']a a Yf Y]bY'VYa Yf_Ybgk YfhY' A\f`]WkY'GhY][Yfib['jcb'%+ž,'ı'ni jYfnY]WkbYb'' 8]YgY'; Y[YbgUhn'nk]gWkYb'_i fnZf]gh][Yb'JYf'ighYbibX'`Ub[Zf]gh][Ya 'K UWkghia 'k]fZh': fU[Yb'nif'GhUV]`]hAh'XYg A Uf_hYg'Ui Z''Gc']gh'XYf' <math>\pm$  XYI '&ž%&ı' ibhYf'gY]bYa 'A\f`]WkYb < OWkghghUbX'jcb', %"' ('ž(\*Dib\_hYbž'UVYf'%'ž%(ı' ØVYf gY]bYa'H]YZghk Yfh'jcb'+\$"'+\$ž)) 'Dib\_hYb''

K  $Ug^{g}bX^{5}_h]Yb]bX]nYg^{i}bX^{}\fY$ 6YXYi hi b[3 9]b \*\Delta XYI \*k ]Y \*XYf \*6G9 \*GYbgYI \*\* \$ \*\Zi b[ ]Yfh \*b ]Wk h \*bi f \*U `g

A Ygg]bghfi a Ybh \*\ZØf \*X]Y \*? i fgYbhk ]W\_`i b[ \*Y]bYf \*; fi ddY \*j cb

5\_h]Yb \*\Delta Yf \*]gh \*Ui Wk \*Y]b \*VUfca Yhf]gWk Yg \*K Yf\_nYi [ \*\ZØf \*XUg

J YfhfUi Yb \*]b \*\X]Y \*k ]fhgWk UZh `]Wk Y \*\GhUV] `]h\Ah" \*\Delta X]nYg \*\Y \*\ZYb

\Delta j YghcfYb \*\Delta X]Y \*\DYfZcfa UbWk \*j cb \*\Sb `U[ Yb \*\ni \*\UbU `mg]YfYb \*\i bX '\ni j Yf[ `Y]Wk Yb \*\G]Y \*\g]bX \*\i bj Yfn]Wk hVUf \*\ZØf \*\XUg \*\J Yfgh\Ab Xb]g \*\XYf

A Uf\_hXmbUa ]\_\* i bX \*\ZØf \*\ghfUhY[ ]gWk Y \*\Delta j Ygh]h]cbgYb hgWk Y]Xi b[ Yb \*\Delta V

# $FY[Y`a \grave{A}][Y`6Yf]W\&hYfghUhhi b[.`9]b`DZ`]W\&hZØf`V`OfgYbbch]YfhY`IbhYfbY\&aYb$

I bhYfbY\a YbžX]Y`Ub`XYf`6ÒfgY`bch]Yfh`g]bXž`a ØggYb`fY[Y`a À»][
: ]bUbnVYf]W\hY`j YfÒZZYbh`]W\Yb"`8]Yg`hfÀ[h`XUni `VY]ž`HfUbgdUfYbn
ni `[Yk À\f`Y]ghYb`i bX`[]Vh`XYb`5b`Y[Yfb`X]Y`bÒh][Yb

₺Zcfa Uh]cbYbž`i a `Z bX]YfhY`9bhgW\Y]Xi b[Yb`ni `hfYZZYb"`8]YgY
6Yf]W\hY`g]bX`YVYbZU``g`YbhgW\Y]XYbX`ZØf`XUg`JYfhfUi Yb`XYf
5b`Y[Yf`]b`XYb`A Uf\_h`i bX`VYY]bZ`i ggYb`gca ]h`X]fY\_h`X]Y`₺X]nYg"

## Jc`Uh]`]hÀh'U`g'< YfUi gZcfXYfi b['ZØf =bj YghcfYb

8]Y'ghÀbX][Y'Jc`Uh]`]hÀh'Ub'XYb'A Àf\_hYb'ghY``h'Y]bY
<YfUi gZcfXYfi b['XUf"'K Ybb'X]Y'5b`Y[Yf'XUg'JYfhfUi Yb'j Yf`]YfYbž
hYbX]YfYb'X]Y'5\_h]YbdfY]gY'XUni 'ni 'ZU``Yb"'8U\Yf']gh'Yg'ZØf

#bj YghcfYb'i bYf`Àgg`]W\ž'X]Y'9bhk ]W\_`i b['XYf'#bX]nYg']a
NY]hj Yf`Ui Z'[YbUi 'ni 'VYcVUW\hYbž'i a 'a Ò[`]W\Y'HfYbXg'ZfØ\nY]h][
ni 'Yf\_YbbYb"

### 8]YJYfUbhk cfhi b[ XYf5b Y[Yf

 $5b`Y[Yf'gd]Y`Yb`Y]bY`YbhgWXY]XYbXY`Fc``Y`]a~:]bUbngmghYa~"`=\fY 9a~ch]cbYbž'gY]`Yg`5b[gh'cXYf'JYfhfUi~Ybž'_ObbYb'[fc>Y 6Yk~Y[i~b[Yb`Ub`XYb`A~Af_hYb`Ui~g`OgYb"`8~U\Yf']gh'Yg`k~]WXh][~ž~XUgg`=\bj~YghcfYb']bZcfa~]Yfh'i~bX`k~c\`ØVYf`Y[h'\UbXY`bž'i~a~b]WXh~j~cb`XYf'a~ca~YbhUbYb'5b[gh'j~cf'J~Yf`i~ghYb'a~]h[Yf]ggYb'ni~k~YfXYb"$ 

B 5;

8 YhU]`g

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z 'b!U[ "XY