

⇒a ][ fUÃ;c  
6UbVz



6UbVz! ; YfU

< c`UbXÄg

? Ub ]\_ [ YX`UZAUYb ]b`OubXQncbXYf`dfcj ]gjYg`hY  
VYfUYb3

DYf[ i bHf`gY`Yi ]g`hYa `hU Ug`XY`Vza ]gg;c`dUFU`gUWf`X]b\Y]fc`Ya `i a `XUXc`dUg

Dcfh [ i Äg

Dcggc`gUWf`X]b\Y]fc`Ya `QUg`QgYa `hYf`ei`Y`dU[ UF`hU Ug3

K Uhn]`b`XY`dfcj ]gjYg`Ug ]\_ [ YX`k ] `UZAUYb`V]^Yyb  
[ YXU`hca`Uhj`Ub`Yb`Ub`XYf`VUb\_3

DYf[ i bHf`ei`U]g`g;c`Ug`hU Ug`Vz`VfUXUg`Lc`gUWf`X]b\Y]fc`bcg`WU] Ug`Y`Yf`Eb]Vz`g`XY`ci`hfcg`VUbVz`g

E i U]g`g;c`Ug`hU Ug`Vz`VfUXUg`g`Yi `i`gUf`WU] Ug`Y`Yf`Eb]Vz`g  
XY`ci`hfcg`VUbVz`g3

6UbVz! `5Vf]bXc`i a U`VzbH`VUbWz]U

< c`UbXÄg

= `nci ` [ fU[ `Yyb`VUb\_fY\_Yb]b[ `cdYbYb"

8 YWUfUf`g`U]b`hYb`Ä;c`XY`UWf]f`i a U`VzbH`VUbWz]U

Dcfh [ i Äg

; cg`hU]U`XY`UWf]f`i a U`VzbH`VUbWz]U'

= `nci ` [ fU[ `a ]`b`VUb\_fY\_Yb]b[ `gi ]`hYb"

8 YWUfUf`g`U]b`hYb`Ä;c`XY`ZYWUf`g`U`VzbH`VUbWz]U

; cg`hU]U`XY`ZYWUf`a ]b\U`VzbH`VUbWz]U'

? Ub ]\_ `Yyb`VUb\_fY\_Yb]b[ `cb`]bY`cdYbYb3

DYf[ i bHf`gY`j`c`WEdcXY`UWf]f`i a U`VzbH`VUbWz]U`dY`U]b`hYf`bYh3

Dcggc`UWf]f`i a U`VzbH`dY`U]b`hYf`bYh3

NU ]\_ `Yyb`VYhU`\_UWf]c`ZYyb`\_fYX]Yh`UWf]\_f]`Yb3

DYf[ i bHf`ei`U`h]dc`XY`WUf]c`j`c`WEdc]f`f`YWVYf`Vza`g`U`VzbH`

J`ci`f`YWVYf`i a`WUf]c`XY`XÄV]h`c`ci`XY`WÄX]h`c3

? Ub ]\_ `VUb`\_YfYb`j`]U`a ]`b`hY`YZccb3

DYf[ i bHf`gY`j`c`WEdcXY`ZYh`Uf`cdYfUÄ`Yg`VUbWz]Ug`dY`c`hY`YZcbY

Dcggc`i`gUf`c`VUbVz`dY`c`Wi``Uf3

K`Y`\_Y`hmdYg`VUb\_fY\_Yb]b[`Yb`n]`b`Yf`Uubk`Yn][`3

DYf[ i bHf`ei`U]g`g;c`cg`h]dcg`XY`VzbH`X]g`dcb]g`Y]g

E`i`Y`h]dcg`XY`VzbH`Ug`VUbWz]Ug`j`c`WÄg`hYa`3

`cdYbXY`fY\_Yb]b[

H]dc`XY`VzbH`VUbWz]U

VzbH`Vz`f`Yb`hY

gdUWfY\_Yb]b[

H]dc`XY`VzbH`VUbWz]U

VzbH`XY`dci`dUbÄU

⇒a ][ fUÃ;c  
6UbVz



dYfgccb`]^\_Y'fY\_Yb]b[  
H]dc`XY`Vz`bHj`VUbWz]U

Vz`bHj`dYggcU

[ YnUa Yb`]^\_Y'fY\_Yb]b[  
H]dc`XY`Vz`bHj`VUbWz]U

Vz`bHj`Vz`b`i` bHj

\_]bXYffY\_Yb]b[  
H]dc`XY`Vz`bHj`VUbWz]U

Vz`bHj`dUfU`Vz]UbÃUg

j fYYa XYj U i hUY\_Yb]b[  
H]dc`XY`Vz`bHj`VUbWz]U

Vz`bHj`XY`a`cYXU`YgfUb[ Y]fU

nU\_Y`]^\_Y'fY\_Yb]b[  
H]dc`XY`Vz`bHj`VUbWz]U

Vz`bHj`Ya`dfYgUf]U

gi XYbhYbfY\_Yb]b[  
H]dc`XY`Vz`bHj`VUbWz]U

Vz`bHj`Ygi`XUb]`

N]`b`Yf`a`UUbXY`]^\_gY`\_cgYb]`ccf`XY`VUb`fY\_Yb]b[`3`  
DYf[ i`bhUf`gY`Yi`]gY`a``hU`Ug`a`YbgU]g`U`gYfYa``dU[ U`g`dY`U`Vz`bHj

9I`]gY`a``hU`Ug`a`YbgU]g3

K`Uhn]`b`XY`dfcj`]g]Ygj`ccf`]bhYfbU]cbU`Y`  
cj`YfgWf]`j`]b[`Yb3`  
DYf[ i`bhUf`gc`VfY`Vz`a`]gg;c`dUfU`hfUbgZYf`fV]Ug]`bhYfbU]cbU]g

E`i`U]gg;c`Ug`Vz`a`]gg`Yg`dUfU`hfUbgZYf`fV]Ug`  
]bhYfbU]cbU]g3

⇒g`Yf`YYb]`YfnY`Yf]b[`j`ccf`]b[`Yj`U`\_]`a`]`b`  
VUb`\_]`Ufhj`Yf`]Ygc`Zj`ccf`U`g`nY`[`Yg`c`Yb`k`cfXh3`  
DYf[ i`bhUf`gY`Yi`]gY`gY[ i`fc`gY`j`c`WEdYfXf`c`gYi``Wfh;c`ci`gY`Y`Y`Zcf`fci`VUXc

9I`]gY`U[ i`a`gY[ i`fc`Wgc`a`Yi``Wfh;c`gY`U`dYfX]Xc`ci`  
fci`VUXc3

?`f]`[`\_]`Yb`W`Yei`YcY`\_`Y3`  
DYf[ i`bhUf`gY`j`c`WfY`WVY`i`a``hU`z`c`XY`W`Yei`Yg`Vz`a``g`U`Vz`bHj

J`ci`f`W`W`Y`f`i`a``hU`z`c`XY`W`Yei`Yg3

K`Uh]g`XY`gdU`ffY`bhY3`  
DYf[ i`bhUf`dcf`]b`Zcfa`UÃ`Yg`gc`VfY`U`hU`U`XY``f`fcg`XU`dci`dUb`ÃU

E`i`U`Ã`U`hU`U`XY``f`fcg`XU`dci`dUb`ÃU3

Cd`k`Y`\_`Y`a`Ub]YfYb`\_]`bhi``a`]`^`VYg`WYfa`Yb`hY[`Yb`  
ZfU`XY3`  
DYf[ i`bhUf`ei`U]gg;c`Ug`a`YX]XUg]hca`UXUg`dY`c`VUbVz`Wz`c`j`c`WfEgY`Uj`É]a`U`XY`ZfU`XY

8Y`ei`Y`a`Ub]YfU`f`W`W`Y`f`Y]`df`ch`Vz`c`Vz`bHj`U`ZfU`XYg3

# ⇒a ][ fUÃ;c 6UbVt

⇒ \W'a ]b'Vub\_\_Ufhj Yf'cfYb"  
8]nYf'ei Yj cWEdYfXYi 'gYi 'Wfhc'XY'VfAX]hc

DYfX]'a Yi 'Wfhc'XY'VfAX]hc"

A ]b'Vub\_\_Ufhik YfX' [ Yg'c`Yb"  
8]nYf'ei Y'gYi 'Wfhc'XY'VfAX]hc'Zc]'fci VUXc"

A Yi 'Wfhc'XY'VfAX]hc'Zc]'fci VUXc"

? Ub ]\_a ]b'Vub\_fY\_Yb]b[ 'Vc\_\_YfYb3  
DYf[ i bhUf'gY'c'VubVt'dcXY'V'cei YUF'g' U'Vt'bhU'VubVt]U

J cWEdcXY'V'cei YUF'a ]b\U'Vt'bhU3

⇒ \W'bccX'Uub'Yyb'j Yfj Ub[\_Ufh'  
8]nYf'ei Yj cWEdfVUg'XY'i a 'Wfhc'XY'fYdcg]Ã;c'dcfei Yj cWEdc'Y'a 'a U]g'c'gYi 'Wfhc'

DfW]g'c'XY'i a 'Wfhc'XY'fYdcg]Ã;c"

## 6UbVt! 5' XU'Z]bUbW]fU

< c'UbX'fj

Dcfh [ i f'j

⇒ 'nci '[ fU] 'k Uh]bZcfa Uh]Y'\YWyb'cj Yf'Yb]b[ 'Yb"  
DYf[ i bhUf'dcf]'bZcfa UÃN'g'g'c'VfY'Ya df'f'g]a cg

; cg]Uf]U'XY'f'YWyf'U'[ i a U]g]bZcfa UÃN'g'g'c'VfY'  
Ya df'f'g]a cg'

K Uh\_Ub'i 'a ]'j YfY'\Yyb'cj Yf'XY'fYbh]j cYb3  
DYX]f]'bZcfa UÃN'g'g'c'VfY'U'U'U'XY'f' fcg3

J cWEdcXY'f]U'a Y'XU'f]'bZcfa UÃN'g'g'c'VfY'U'U'U'XY'f' fcg3

⇒ 'nci '[ fU] 'k Uh]bZcfa Uh]Y'\YWyb'cj Yf  
\m'cl'h\_Y\_Yb"  
DYX]f]'bZcfa UÃN'g'g'c'VfY'\]dch'W]g'Y'Z]bUbV]Ua Yb'rcg

; cg]Uf]U'XY'f'YWyf'U'[ i a U]g]bZcfa UÃN'g'g'c'VfY'  
\]dch'W]g'Y'Z]bUbV]Ua Yb'rcg'

⇒ 'nci '[ fU] 'a Yh'Yyb'\m'cl'h'Y'Y\_UX] ]gYi f'gdfY\_Yb"  
DYX]f'dU'f'U'Z]U'f'V'ta 'i a 'V'tbg' 'h'c'f'g'c'VfY'Z]bUbV]Ua Yb'rcg'Y'\]dch'W]g

; cg]Uf]U'XY'Z]U'f'V'ta 'i a 'V'tbg' 'h'c'f'g'c'VfY'  
Z]bUbV]Ua Yb'rcg'Y'\]dch'W]g'

⇒ '\_ccd'a ]b'Yf'g'Y'\i ]g'  
8]nYf'ei Yj cWEdYg'h]V'ta dfUbXc'g' U'df]a Y]f'U'W]g]U'df] df]U

9g'ci 'V'ta dfUbXc'a ]b\U'df]a Y]f'U'W]g]U'df] df]U'

⇒ '\_ccd'Yyb'hk'YXY'Y][ YbXca "  
8]nYf'ei Yj cWEdYg'h]V'ta dfUbXc'i a U'gY[ i bXU'df'cdf]YXUXY"

9g'ci 'V'ta dfUbXc'i a U'gY[ i bXU'df'cdf]YXUXY"

⇒ 'nci '[ fU] 'a ]b'\m'cl'h'Y'Y\_j Yfb]Yi k Yb"  
8]nYf'ei Yj cWEd[ cg]Uf]U'XY'Z]hYf'i a 'fYZ]bUbV]Ua Yb'rc

9i '[ cg]Uf]U'XY'Z]hYf'i a 'fYZ]bUbV]Ua Yb'rc"

⇒a ][ fUÃ;c  
6UbVt



⇒\_inci '[ fU[ 'a ]b`i ]X][ Y`mclh\Y\_`Yfn]Yb" ; cgUf]U'XY'ZuhYf' i a U'fY] ]g;c'XY'a ]b\U\]dchWU'U'U"  
8]nYf'ei Y'j cWÆ[ cgUf]U'XY'ZuhYf' i a U'fY] ]g;c'XY'g' U\]dchWU

⇒\_ccd'Y][ YbXca 'ca 'h'cbXYfj Yf\i fYb" 9gci 'Wta dfUbXc'i a U'dfcdf]YXUXY'dUfU'UffYbXUa Ybhc"  
8]nYf'ei Y'j cWÆYgh1/2Wta dfUbXc'i a U'dfcdf]YXUXY'dUfU'UffYbXUa Ybhc

A ]b`Vfi hc`Uuf]b\_ca Yb`]g'SSSSSS" A Yi `fYbX]a Ybhc`Ubi U`Vfi hc`ÅXY'SSSSSS"  
8]nYf'ei U`Å'gYi `fYbX]a Ybhc`Ubi U`Vfi hc

6UbVt! 'GY[ i fc

< c`UbXAq

⇒\_inci '[ fU[ `Yyb] YfnY\_Yf]b[ `Uzg]i ]hYb"  
8]nYf'ei Y'j cWÆYgh1/2bhYfYggUXc'Ya `gY[ i fcg

Dcfh [ i Aq

; cgUf]U'XY'WbhfU'U'f' i a `gY[ i fc"

]bVcYXY`#cdgUj YfnY\_Yf]b[ gY[ i fc'XY`UW]hUÃ;c  
H]dc`XY'gY[ i fc

fY]g YfnY\_Yf]b[ gY[ i fc'XYj ]U[ Ya  
H]dc`XY'gY[ i fc

`Yj Ybg YfnY\_Yf]b[ gY[ i fc'XYj ]XU  
H]dc`XY'gY[ i fc

[ YncbX\Y]Xg YfnY\_Yf]b[ gY[ i fc'XY'gUÖXY  
H]dc`XY'gY[ i fc

U hcj YfnY\_Yf]b[ gY[ i fc'U hca ]j Y  
H]dc`XY'gY[ i fc

\i ]gX]YfYbj YfnY\_Yf]b[ gY[ i fc'gUÖXYUb]a U  
H]dc`XY'gY[ i fc

X]YZgUj YfnY\_Yf]b[ gY[ i fc'WbhfU'fci Vc  
H]dc`XY'gY[ i fc

\mclh\Y\_`VYgWYfa ]b[ gY[ i fc'XY'dfchVÃ;c'gcVfY'U\]dchWU  
H]dc`XY'gY[ i fc

⇒a ][ fUÃ;c  
6UbVz



gi XYbHYbj YfnY\_Yf]b[  
H]dc`XY`gY[ i fc

gY[ i fc`Ygi XUbh`

[ fcYdgj YfnY\_Yf]b[  
H]dc`XY`gY[ i fc

gY[ i fc`XY[fi dc

gWUXYj YfnY\_Yf]b[  
H]dc`XY`gY[ i fc

gY[ i fc`XY`dfcdf]YXUXY

cj Yfgfca ]b[ gj YfnY\_Yf]b[  
H]dc`XY`gY[ i fc

gY[ i fc`VbhfU]bi bXUÃNg

VfUbXj YfnY\_Yf]b[  
H]dc`XY`gY[ i fc

gY[ i fc`VbhfU]bWbX]c

J ccf`cYj YY`a UbXYb`Vyb]\_[ YXY\_hXccf`a ]`b  
j YfnY\_Yf]b[ 3

Dcf`ei Ubhcgja YgYgXi fU`U`WVYfh fU3

DYf[ i bUf`ei Ubhcgja YgYgXi fU`g U`V`VYfh fU`Xc`gY[ i fc

<cYj YY`\_cghXYj YfnY\_Yf]b[ 3  
DYf[ i bUf`c`Wgnc`Xc`gY[ i fc

E i U`Ãc`Wgnc`Xc`gY[ i fc3