

### ?U]gYf'ZY]Yfh'gY]bY'@]YVY'ni '8fYgXYb. ?cbnYfhY'i bX'Di V`]WJ]Yk]b[']b GYY`][ghUXh

 $9f`YVYb`G]Y`X]Y`FØW\_Y\f`jcb`?U]gYfaUb]U`]b`8fYgXYb°?cbnYfhYžY]bY`< mabY`ibX`DiV`]WJ]Yk]b[`]b`GYY`][ghUXhjYfgdfYWXYb`ibjYf[Ygg`]WXY`IbhYf\U`hib[`Ua`9`ViZYf"$ 

## 8]Y'FØW\_\_Y\f'j cb'?U]gYfa Ub]U.'9]b \_i `hi fY``Yg'<][\`][\h'ZØf'8fYgXYb

 $8 ]Y `GhUXh' 8 fYgXYb \check{z} VY\_Ubbh' ZØf'] \land fY `VYY]bXfi W\_YbXY' 5 fW ]hY\_hi fi bX'] \land fY `fY]WXY'; YgWX]WX hY \check{z} Yf `YVh'YfbYi h'Y]bYb'\_i `hi fY``Yb < O\Ydi b\_h' 8 ]Y `J YfUbghU`hi b[ '? U]gYfa Ub]U'n]Y \hi]b'X]YgYa '\\J\f nU\`fY]WXY': Ubg'Ub"' 8 ]YgY `Y]bn][ Ufh][ Y'?cbnYfhfY]\Yž'X]Y'j ca <math display="block">VY`]YVhYb'GAb[Yf'Fc`UbX'?U]gYf']bg'@YVYb'[Yfi ZYb'ki fXYž']gh'Y]bZYghYg'9fY][ b]g']a 'J YfUbghU`hi b[ g\_U`YbXYf'XYf'9`VYghUXh'''$ 

#### Fc`UbX?U]gYf. 9]b A UbbžY]bY GhUXh

 $\label{thm:composition} Fc`UbX'?U]gYfžY]b`[YVØfh][Yf`6Yf`]bYfž`\Uh'Y]bY`h]YZ[fY]ZYbXY\\ JYfV]bXib[`ni`8fYgXYbž'X]Y`gY]h`gY]bYa`YfghYb`5iZhf]hh`]a`\text{$J\f$} %--$`VYghY\h".8Yf`?Øbgh`Yf`\Uh`b]W\h`bif`gY]bY`@]YVY`nif`GhUXhUig[YXfØW_hž`gcbXYfb`UiW\Y]bY`<mabY`ZØf`8fYgXYb[YgWXf]YVYbž'kcXifW\gY]bY`5ZZÅfY`a]h`XYf`GhUXh`]b`XYb`<YfnYbXYf`AYbgW\Yb`ZYgh'jYfUb_Yfh`]gh".8]YgY`dYfgÒb`]W\Y`JYfV]bXib[ibX'gY]bY`^\A\f`]W\Yb`5iZhf]hhY`gh\Af_Yb`b]W\h'bif`gY]b`\=aU[YžgcbXYfb`UiW\X]Y`_i`hifY``Y`\=\Ybh]h\h'xYf`FY[]cb"$ 

9]b`UXi b[ 'ni a 'Di V`]WJ ]Yk ]b[

±0 X]YgYa → J\f Z]b XYb X]Y ? cbnYfhY Ua YfghYb 5i [i gh! K cWXYbYbXY ghUhhi bX V]YhYb XYb : Ubg X]Y A Ò[`]WX \_Y]hž Y]b i bj Yf[Ygg`]WXYg 9f`YVb]g ni 'hY]`Yb "'6Ygcb XYfg VYa Yf\_Ybgk Yfh`]gh XUg Di V`]WJ]Yk ]b[ ž XUg ]b XYf \_ Y]bYb ; Ya Y]bXY GYY`][ ghUXhž Yhk U &) '?]`ca YhYf Ògh`]WX j cb 8 fYgXYbg ? Òb][ gi ZYfž cf[ Ub]g]Yfh k ]fX" 8 ]Yg Yfa Ò[`]WX h U i W XYbYbž X]Y 'b]WX h X]fY\_h j cf C fh gY]b \_ ÒbbYbž Y]bYb Ni [ Ub[ 'ni X]YgYa 'a i g]\_U`]gWX Yb '9fY][ b]gž k Ug X]Y ; Ya Y]bgWX UZh ]b XYf FY[ ]cb k Y]hYf ni gUa a YbgWX k Y]» h"

#### 8]Y 6YXYi hi b[ ZØf X]Y ; Ya Y]bgW UZh

8]Y'JYfUbghU'hi b['\Uh'k Y]hfY]W\YbXY'5i gk]f\_i b[Yb'Ui Z'X]Y
`c\_U`Y'; Ya Y]bgW\UZh"5i ZZØ\fi b[Yb'k]Y'?U]gYfa Ub]U'`cW\_Yb'b]W\h
bi f'6Ygi W\Yf'j cb'Ui »Yf\U`V'Ubž'gcbXYfb'VY`YVYb'Ui W\XX]Y'`c\_U`Y
K]fhgW\UZh"FYghUi fUbhgž'<chY`g'i bX'; YgW\ÀZhY'dfcZ]h]YfYb'j cb
XYb'ghY][YbXYb'6Ygi W\YfnU\`Ybž'X]Y'Xi fW\'gc`W\Y'\_i `hi fY``Yb
9j Ybhg'YbhghY\Yb"8]Y'Gh]a a i b[']b'XYf'GhUXh']gh'ZYgh`]W\'i bX
j YfY]bh'A YbgW\Yb'Ui g'i bhYfgW\]YX`]W\Yb'@YVYbgVYfY]W\Yb']b
]\fYf'6Y[Y]ghYfi b['ZØf'@j|Y!A i g]\_"

#### : Un]h 'A $Y \setminus f'U \setminus g'bif'Aig]_$

?U]gYfa Ub]U']gh'b]W\h'bi f'Y]b'?cbnYfhž'gcbXYfb'Y]b'NY]W\Yb'ZØf X]Y'\_i `hi fY``Y'J]hU`]h\h'8 fYgXYbg"'8]Y'F ØW\_\_Y\f'j cb'Fc`UbX'?U]gYf ]gh'Y]b'6Yk Y]g'ZØf'X]Y'Gh\h'f\_Y'XYf'JYfV]bXi b['nk]gW\Yb'?Øbgh\Yf i bX'GhUXh'gck]Y'ZØf'X]Y'6YXYi hi b['[Ya Y]bgUa Yf'9f\YVb]ggY'ZØf X]Y'`c\_U`Y'; Ya Y]bgW\UZh"'>XYf'5i Zhf]hh'V]YhYh'X]Y'7\UbW'ž 9f]bbYfi b[Yb'ni 'gW\UZZYb'i bX'X]Y'\_i `hi fY``Y'=XYbh]h\h'8 fYgXYbg ni 'ZY]Yfb"

B5;

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