

## Gdf]hdfY]gY]b8fYgXYb. < ]YfhUb\_YbG]Y \YihYUa[Øbgh][ghYb°

9fZU\fYb'G]Y'X]Y'U\_hi Y``Yb'Gdf]hdfY]gY']b'8fYgXYbž']\fY 9]bZØggY'i bX'H]ddgž'k Ubb'G]Y'Ua''[Øbgh][ghYb'hUb\_Yb ObbYb"



8fYgXYbž'8Yi hgW `UbX'!'K c\]b'[Y\h'X]Y'FY]gY']b'di bWhc Gdf]hdfY]gY3'5a '%' "'\$\darkspace b]'&\darkspace b]'&\darkspace b]'&\darkspace b]'&\darkspace b]'&\darkspace b]'&\darkspace b]'&\darkspace b]'&\darkspace b]'\darkspace b

8]Y'U\_hi Y``Y'DfY]g`U[Y'ZØf'8]YgY``gck]Y'Gi dYf'9) ii bX'9%\$'\_UbbUi Z'Y]bYf']bhYfU\_h]j Yb'? UfhY'UV[Yfi ZYb'k YfXYb"'Bi hnYf'\UVYb'X]YA Ò[`]W\\_Y]hž'bUW\'Cfh'cXYf'Dcgh`Y]hnU\``ni 'gi W\Ybž'i a 'X]Y[Øbgh][ghYb'HUb\_ghY``Yb']b']\fYf'; Y[YbX'ni 'Z]bXYb"'8UVY]'[]Vh'Yg]b'8fYgXYb'i bX'XYa 'i a `]Y[YbXYb'GUW\gYb'[Y`Y[Ybh`]W\

5Vk Y]Wki b[Yb'j cb'XYb'8i fWkgWkb]hhgdfY]gYbž'X]Y'g]Wk'hÀ[`]Wk AbXYfb"'8Ug'nY][Yb'X]Y'=bZcfa Uh]cbYb'Ui g'XYf A Uf\_hhfUbgdUfYbnghY``Y'?fUZhghcZZY"

## DfY]ghfYbXg'i bX'HU[YgnY]hYb

K ]Y 'ØVYfU``ž'i bhYf`]Y[Yb'Ui W. 'X]Y 'Gdf]hdfY]gY ']b'8Yi hgW\`UbX
[Yk]ggYb'gU]gcbU`Yb'GWk Ub\_i b[Yb"'\dot\b'XYb'k Ufa Yb
Gca a Yfa cbUhYb'g]bX'X]Y 'DfY]gY'a Y]gh'\Ò\Yf"'8UZØf
j YfUbhk cfh`]W\'g]bX'X]Y 'Fc\Ò`dfY]gY'Ui Z'XYa 'K Y`ha Uf\_hž'XYf
K YW\gY`\_i fg'9i fc!8c``Uf'i bX'Ui W\'dc`]h]gW\Y'9bhgW\Y]Xi b[Ybž
k]Y 'XYf'HUb\_fUVUhh']a 'Gca a Yf'&\$&&ž'k]Y'X]Y']W\!hUb\_Y"XY
ZYghghY``h": Øf'5i hcZU\fYf']gh'Yg'ni XYa 'ghfUhY[]gW\'\_i [ž'X]Y
I\fnY]h'VY]a 'HUb\_Yb']a '5i [Y'ni 'VY\U`hYb.'; YbYfY```g]bX'X]Y
DfY]gY'nk]gW\Yb'\*'i bX', 'I\f'Ua '\ÒW\ghYb'"8]Y'[Øbgh][ghY'NY]h
ni a 'HUb\_Yb'`]Y[h'\]b[Y[Yb'nk]gW\Yb'%+'i bX'&\"I\f"

K i gghYb 'G]Y 'gWX cbž'XUgg 'X]Y 'DfY]gY 'Ub '5i hcVU\bhUb\_ghY``Yb']a 8i fWXgWXb]hh'\O\Yfg]bX3'@Ui h'XYf'GÀWXg]gWXYb "XY'g]bX'X]YgY fi bX'(&'7Ybh'ZØf'6Ybn]b'i bX'' \*'7Ybh'ZØf'8]YgY`hYi fYfž'k Ug'Ui Z XYb'K YhhVYk YfV'i a 'GhUbXcfhY'ni fØW\_ni ZØ\fYb']gh"'9]ba U`'a Y\fnY][h'X]YgY' & Zcfa Uh]cbž'XUgg'Yg'g]WX'`c\bhž'X]Y'DfY]gY'[YbUi 'ni ]a '5i [Y'ni 'VY\U`hYb"

## JYfÀbXYfi b[Yb']a 'DfY]ggmghYa

GY]h'Y]b][Yf'NY]h'g]bX'X]Y'6YhfY]VYf'XYf'HUb\_ghY``Yb'[YgYhn`]WX j YfdZ]WXhYhž'DfY]gÀbXYfi b[Yb']bbYf\U`V'j cb'ZØbZ'A]bi hYb'Ub'X]Y A Uf\_hhfUbgdUfYbnghY``Y'XYg'6i bXYg\_UfhY``Ua hYg'ni 'a Y`XYb" 8 UfUi g'Yf[]Vh'g]WX'Y]bY'9WXhnY]h!DfY]gXUhYbVUb\_ž'X]Y'i bhYf UbXYfYa 'j cb'5857'[Ybi hnh'k]fX"'K]WXh]['ni 'VYUWXhYb.'8]Y DfY]gYž'X]Y'G]Y'Ub'XYf'NUdZgÀi `Y'gY\Ybž'gc``hYb']a a Yf'U`g U\_hi Y``Y'K YfhY'VYhfUWXhYh'k YfXYbž'i a 'VÒgY', VYffUgWXi b[Yb'ni j Yfa Y]XYb"

Ni gUa a YbZUggYbX``Àggh'g]W\`gU[Ybž'XUgg`X]Y`Gdf]hdfY]g`U[Y`]b 8fYgXYb`Y]b`K YW\gY`VUX`XYf`; YZØ\`Y`]gh"`K Yf`g]W\`]bZcfa ]Yfh'i bX X]Y`f]W\h][Yb`NY]hYb`k À\`hž'\_Ubb`cZha U`g`XUg`6YghY`Ui g`gY]bYa  $\label{lem:hub_Yf^YVb} $$ HUb_Yf^YVb]g^XYf^Uig^C^Yb^Gc^V^Y]Vh^a Ub^B XYf^GhUXh^XYg^F^Y]bg $$ a Yf^a cV]^UibX^LUbb^X]Y^CfY]h^Gc^f]WXh][Uig_cghYb^Cf]WXh][Uig_cghYb^Cf]WXh][Uig_cghYb^Cf]WXh][Uig_cghYb^Cf]WXh][Uig_cghYb^Cf]WXh][Uig_cghYb^Cf]WXh][Uig_cghYb^Cf]WXh][Uig_cghYb^Cf]WXh][Uig_cghYb^Cf]WXh][Uig_cghYb^Cf]WXh[Uig_cghYb^Cf]W$ 

8 YhU]`g	
Cfh	8 fYgXYbž'8 Yi hgW\`UbX
EiY``Yb	<ul> <li>k k k "gUYWX g]gWX Y"XY</li> </ul>
	• ]WX!hUb_Y"XY
	• k k k "UXUWXY

6Ygi WXYb G]Y i bg Ui Z. b!U[ "bYh