

K]YbYf`DZUbXj YfVch. `@]a c!< YfghY``Yf ZcfXYfh`bYi Y`@Ògi b[Yb`ZØf`6YXØfZh][Y°

K]Yb 'j YfZc`[h'ghf]_hY 'DZUb XfY[Y`i b[Yb"'9fZU\fYb 'G]Yž'k Ufi a XUg '5 VghY``Yb 'j cb 'DZUb X 'b Y V Yb '7 cb hU]b Yfb 'j YfVchYb ']gh'i b X k Y`W\Y'@Òqi b[Yb '[YZcfXYfh'k YfXYb"



K]Ybž'² ghYffY]W '! ' \pm b'K]Yb'k]fX'XUg'H\Ya U'DZUbX[YV]bXY XYfnY]h'\Y]» 'X]g_i h]Yfh'' @Ui h'A Y]b6Yn]f_ 'ghY\h'X]Y'GhUXhVY\ÒfXY ghf]_h'[Y[Yb'XUg'5VghY``Yb'j cb'DZUbXZUgW\Yb'bYVYb A Ø``WcbhU]bYfbž'i a 'JYfi bfY]b][i b[Yb']a 'ÒZZYbh']W\Yb'FUi a 'ni j Yf\]bXYfb'''K Yf'[Y[Yb'X]YgYg'JYfVch'j YfghÒ» hž'_Ubb'a]h'GhfUZYb j cb'V]g'ni '&"\$\$\$'9i fc'fYW\bYb''8]Y'K]YbYf'5VZU``k]fhgW\UZh'f\A 5 (, \&'VYhfUW\hYh'gc`\W\Y'DZUbXUVghU``i b[Yb'U`g'gcn]U``b]W\h hfYZZg]W\Yf'i bX'\m[]Yb]gW\'VYXYb_`]W\"'GhUhhXYggYb'a ØggYb'X]Y DZUbXZ'UgW\Yb']b'XYb'A Ø``ž'k Ybb'g]Y'b]W\h'Ub'XYb'Gi dYfa Uf_h ni fØW_[YVfUW\h'k YfXYb''

8Yf'@a cbUXYb\YfghY``Yf': f]hn!?c`U'\YVh'X]Y'6YXYi hi b['j cb DZUbXgdYbXYb'\Yfj cfž'gck c\``ZØf'VYXØfZh][Y'A YbgW\Yb'U`g'Ui W\ ZØf'XYb'FYWhW]b[!DfcnYgg"'K À\fYbX']b'8Yi hgWX`UbX'Yhk U %"\$) \$"\$\$\$ A YbgWXYb'DZUbXZ'UgWXYb'gUa a Y`b'i bX'YfghUi b`]WXY +* i 'X]YgYf'GUa a `Yf'b]WXh'cVXUWX`cg'g]bXž'k]fX'XUg'GUa a Y`b j cb'DZUbXZ'UgWXYb'cZh'a]h'GWXUa 'VY\UZhYh''8]Yg'nY][hž'k]Y k]WXh]['Yg']ghž'5VghY``a Ò[`]WX_Y]hYb'ni 'gWXUZZYbž'i a 'ni j Yf\]bXYfbž'XUgq'DZUbX[i h']a 'FYgha Ø```UbXYh''

5`hYfbUh]jYb'ibX'@Ògib[Yb

±b`UbXYfYb`ÒghYffY]WX]gWXYb`GhÀXhYb`k]Y`@]bn`i bX`±bbgVfi W_`[]Vh Yg`VYfY]hg`DZUbXf]b[Y`Ub`ÒZZYbh`]WXYb`A]gh_ØVY`bž`X]Y`dcg]h]j Y 6Y]gd]Y`Y`gYhnYb": f]hn!?c`U`ZcfXYfh`bi b`X]Y`K]YbYf GhUXhj Yfk U`hi b[`Ui Zž'À\b`]WXY`@Ògi b[Yb`ni `Ybhk]W_Y`bž`X]Y`b]WXh bi f`XYb`DZUbX_fY]g`Ui Z`ZÒfXYfbž'gcbXYfb`Ui WX`gcn]U` gWXkÀWXYfYb`A]h[`]YXYfb`XYf'; YgY``gWXUZh`ni [i hY_ca a Yb"

Ni gàhn`]W\ 'g]bX'X]Y'fYW\ h`]W\ Yb'FU\a YbVYX]b[i b[Yb'ZØf
DZUbXj YfdUW_i b[Yb']b'2 ghYffY]W\ '_`Uf'ZYgh[Y`Y[h"'JYf_Ui ZgghY``Yb
a]h`DZUbX`c[c'g]bX'j YfdZ`]W\ hYhž'9]bk Y[dZUbXj YfdUW_i b[Yb
ni fØW_ni bY\a Yb"'5b'ghUf_'ZfYei Ybh]YfhYb'CfhYb'k]Y
9]b_Ui ZgnYbhfYb'i bX'6U\b\ÒZYb'_ÒbbYb'a Y\fYfY'JYf_Ui ZgghY``Yb
Y]bY'[Ya Y]bgUa Y'FØW_bU\a YghY``Y'Y]bf]W\ hYbž'k Ug'X]Y
FØW_[UVY'ZØf'JYfVfUi W\Yf'XYi h`]W\'Yf`Y]W\ hYfhž'k]Y'X]Y'c ZZ]n]Y``Y
GY]hY'XYg'ÒghYffY]W\]gW\Yb'GhUUhYg'a]hhY]`h"

8]Y 6YXYi hi b[j cb DZUbXgmghYa Yb

DZUbXgmghYa Y`\UVYb`Y]bYb`a Yf_`]W\Yb`9]bZi ggʻUi ZʻX]Y

5VZU``k]fhgW\UZh`]b`j]Y`Yb`@\bXYfb"'8Yf'; `cVU``K UghY`\bXYI j cb

GYbgcbYc`nY][hž'XUgg`@\bXYf`a]h`YhUV`]YfhYb`DZUbXgmghYa Yb`]a

5``[Ya Y]bYb`VYggYfY`FYWmW]b[k YfhY`j cfk Y]gYb`_ObbYb"

6Y]gd]Y`gk Y]gY`\Uh`X]Y`9I `ZYgh[Y`Y[hž'XUgg`V]g`&\$&) `++`i `XYf

D`Ugh]_[Yhf\b_YZUgW\Yb`[YgUa a Y`h`k YfXYb`a ØggYb"'² ghYffY]W\
ghUfhYh`gY]b`bYi Yg`DZUbXgmghYa `Ua `%"`\Jbi Uf`&\$&) `i bX`_ObbhY

XUa]h`YbhgW\Y]XYbX`ni f`FYXi _h]cb`j cb`5VZ\``Yb`i bX`9a]gg]cbYb

VY]hfU[Ybž'k]Y`GYbgcbYc`Yf_`\Afh"

 $\label{eq:normalized_normalized_normalized} Ni~gUa~a~YbZUggYbX`gc``hY`X]Y`K~]YbYf`GhUXhj~Yfk~U`hi~b[~`X]Y$

Gh]a a Y'XYf'6Øf[Yf]bbYb'i bX'6Øf[Yf'gck]Y'X]Y'5b`]Y[Yb'XYf @]a cbUXYb]bXi ghf]Y'Yfbgh'bY\a Ybž'i a 'Y]b'YZZY_h]j Yg'i bX'gcn]U`[YfYW\hYg'DZUbXgmghYa 'ni 'YhUV`]YfYb"'8]Y'U_hi Y``Yb'A U» bU\a YbnY][Ybž'XUgg'XYf'6U``']bg'Fc``Yb'[YVfUW\h'k YfXYb'_Ubbž'i a 'X]Y 5VZU``VYk]fhgW\UZhi b[']b'K]Yb'bUW\\U`h]['ni 'j YfVYggYfb'i bX [`Y]W\nY]h]['gcn]U`Y'6fYbbdi b_hY'ni 'Ybh`UghYb"

8 YhU]`g	
Cfh	K]Ybž ^{·2} ghYffY]WX
EiY``Yb	• k k k "a Y]bVYn]f_"Uh
	k k k "cYghYffY]WX"[j "Uh
	• gYbgcbYc"Wca

6Ygi WXYb G]Y i bg Ui Z. a Y]b!k]Yb bYh