

5`Ufa 'Ua '6UXYgYY'CVYfUW\.'; YZÀ\f`]W\Y 6`Ui U`[Yb 'ZØf'?]bXYf'i bX'<i bXY°

5a '&' "\$*"&\$&) 'k i fXYb']a '6UXYgYY'C VYfUW\'[YZÀ\f`]W\Y 6`Ui U`[Yb'bUW\[Yk]YgYb"'6UXYb'a]h'?`Y]b_]bXYfb'i bX <i bXYb'k]fX'UV[YfUhYb"



CVYfUWX ž8Yi hgWX`UbX'!8Yf'Gca a Yf']gh']b'j c``Ya '; Ub[Y'i bX X]Y'HYa dYfUhi fYb'`UXYb'[YfUXYni 'Y]bž'g]WX']b'X]Y'YfZf]gWXYbXYb; Yk ÀggYf'XYf'FY[]cb'ni 'ghØfnYb"'8cWX'ZØf'X]Y'6UXYhU[Y'Ua 6UXYgYY'CVYfUWX'[]Vh'Yg'XYfnY]h'Y]bY'i bYfZfYi `]WXY'BUWXf]WX h 8Ug'@UbXfUhgUa h'5]WXUWX!: f]YXVYf['\Uh'Ua '&' "\$*"&\$&) 'X]Y K UggYfei U`]hAh'XYg'GYYg'[YhYghYh'i bX'XUVY]'X]Y'[YZA\f`]WXY 6`Ui U`[YbUfh'HmWXcbYa U']a 'I ZYfVYfY]WX'ZYgh[YghY``h"'8]Yg'gc``hY 6\UYb'a]h'_`Y]bYb'?]bXYfb'i bX'<i bXYb'j cfYfgh'Ui Z'9]g'`Y[Ybž'gc X]Y'9a dZY\`i b['XYf'6Y\ÒfXY"'K UggYfgdcfh`Yf'_ÒbbYb'YXcWX VYfi \][h'gY]bž'XU'X]Y'G]hi Uh]cb'ZØf'g]Y'i bVYXYb_`]WX'VY]Vh"'8]Y HYghg'Ua '6UXYgYY'k YfXYb'_cbh]bi]Yf`]WX'Zcfh[YgYhnhži bX'Y]bY YfbYi hY'6YdfcVi b['ghY\h'VYfY]hg'Ua '_ca a YbXYb'A]hhk cWX'Ub" 8]Y'9f[YVb]ggY'k YfXYb'i a [Y\YbX'VY_Ubbh'[Y[YVYbž'k]Y'`fU!U]W

 $K Ug ghY W_h^{-1}bhY f^{-1}X YgYb^{-6}UiU^{-1}Yb3^{-9}g^{-1}UbXY^h^{-1}gW^{-1}a$ 7 mUbcVU_hYf]YbžX]Y]b k Àfa YfYb i bX gcbb][YfYb A cbUhYb VYgcbXYfg ghUf_ k UW gYb "HmW cbYa U _Ubb VY] a UggYb \ UZhYa 5 i ZhfYhYb VfUi bY 'HYdd | WXY 'Ui Z'XYf 'K UggYfc VYfZ'ÀWXY 'V] `XYbž 'k Ug $Y = XY = h^{1}W_{X} + g^{2}K_{Y} + g^{2}K_$ BYf| Yb[]Zh:5bUhcl]b:5ž'k Y`WXYg'[YZÀ\f`]WXY'[Ygi bX\Y]h`]WXY 5i gk]f_i b[Yb `\ UVYb `_Ubb" BYVYb BYfj YbUi gZÀ ``Yb i bX 5hYa gh]``ghUbX'_ÒbbYb'jcf'U``Ya '?`Y]b_]bXYf'ibX'<ibXY']b ; YZU\f`gY]bž`XU`g]Y`g]W\`\Ài Z][`]a `Z`UW\Yb`K UggYf`Ui Z\U`hYb`i bX XUni 'hYbX]YfYbž'8]b[Y']b'XYb'AibX'ni 'bY\aYb"'8U\Yf'gc``hYb 9`hYfb'i bX'<i bXYVYq]hnYf'VYqcbXYfq'k UW\qUa 'qY]b"'5i W\'k Ybb _Y]bY`HYdd]WXY`]a `K UggYf`g]WXhVUf`g]bXž`]qh`Yq`fUhqUa ž`XUqq H]YfY'i bX'?]bXYf'b]W\hij ca 'GYY'hf]b Yb'cXYf'Ub[YgW\k Ya a hY A UhYf]U`]Yb`]b`XYb`A i bX`bY\a YbžXYbb`<i bXY`bY][Yb`XUni ž GhÒW_WXYb i bX K UggYfd Z`UbnYb ni 'ZfYggYb" 5 i WX 'XUg 'V YghÀh][hY ' bXf"XY"

8]Y; Ygi bX\Y]hgf]g]_Yb Xi fW 6`Ui U`[Yb

8]Y; YZU\fYbžX]Y; cb'6`Ui U`[Yb'Ui g[Y\Ybžg]bX'b]W\hini i bhYfgW\hm\b"K\hm\fybX'K\UggYfgdcfhYf'_Y]bY; YZU\f
Ui g[YgYhnhig]bXž_ObbYb'UbXYfY'DYfgcbYb'VY]?cbhU_hicXYf
JYfgW\i W_Yb'j cb'_cbhUa]b]YfhYa 'K UggYf'a]h'Yfbgh\UZhYb
Gma dhca Yb'fYW\bYb"'8Uni 'n\hm\iYb', VY`_Y]hž; `]YXYfgW\a YfnYb
i bX'gc[Uf'5hYa k Y[gYf_fUb_i b[Yb"'6YgcbXYfg'[YZ\hfXYh'g]bX
YbY'a]h'[YgW\k\hm\hya '=a a i bgmghYa 'gck]Y'?`Y]b_]bXYf'i bX
GW\k\Ub[YfY"'9]b'6`]W_'Ui Z'X]Y'K\UggYfcVYfZ\hm\y'j Yff\hicZh
VYfY]hg'j]Y`.'; f\leftab`]W\Y'cXYf'[]Zh]['V`Ui ![f\leftab`]W\Y'Hf\leftavi b[Yb'cXYf
Ui W\K c`_YbYfgW\Y]bi b[Yb']a 'K\UggYf'g]bX'NY]W\Yb'Z\leftafY]bY
A\UggYbj Yfa Y\fi b['j cb'6`Ui U`[Yb"'K\Ybb':]g\W\Y'Ub'X]Y
C\YfZ\hm\W\Y'hf\]VYb\z']gh'X]Yg'c\Zh\Y]b'\k\Y]hYf\g'5`Ufa nY]W\Yb"'I a
g]W\Yfni [Y\Yb\z'gc``hY'i b\YYX]b[h'Ui Z'X]Y'c\zZ]n]Y``Yb'6\UX\YghY``Yb
ni f\leftaW_[Y[f]\zXyb'k\YfXYb\z'k\c'X]Y'K\UggYfei U`]h\h'f\Y[Y\a \ha\sigma][
_cbhfc``]Yfh'k]f\z'k]Y'Ui Z'\Yf\]b"XY'Ub[Ya\Yf_h'k]f\x'"

± XYf FY[]cb []Vh Yg Ui W 'Ÿ\b`]W _Y]hYb 'ni 'Ub XYfYb'; Yk ÀggYfb

5VgWX`]Y» YbX`V`Y]Vh`ni `gU[Yb.`5i WX`k Ybb`X]YgY`\DZcfa Uh]cbYb XYb`Gca a Yf`b]WXh'j YfXYfVYb`gc``hYbž`]gh'J cfg]WXh'[YVchYb" 5WXhYb`G]Y`Ui Z`X]Y`<]bk Y]gY`XYf'; Ygi bX\Y]hgÀa hYf'i bX`[Yb]Y» YbG]Y`X]Y`\Y]» Yb`HU[Yž'j cfni [gk Y]gY`i bhYf`g]WXYfYfYb 6YX]b[i b[Yb°

8 Y hU]`g	
Cfh	CVYfUWXž8YihgWX`UbX
EiY``Yb	`fU!U]WZXV"XY
	• k k k "VYf`]b"XY
	• k k k "bXf"XY

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z. 'bU[!VUmYfb"XY