

K Y]XY\U`hi b['bYi '[YXUW\h. 'H]ddg 'ZØf H]Yfk c\`i bX K]fhgW\UZh`]W_Y]h°

 $= a \cdot @UbX_fY]g \cdot @JWhYbZY \cdot g \cdot]bZcfa]YfYb \cdot @UbXk]fhY \cdot ØVYf \\ K Y]XY \setminus U \cdot hi b[\check{z} \cdot H]Yfk c \setminus ``i bX \cdot K]fhgW \cdot UZh \cdot]W _Y]h \cdot VY] \cdot Y]bYa \\ DfUl]ggYa]bUf"$



@]Wk hY b ZY`gž'8 Yi hgWk`Ub X`!'9]b`gdUbbYbXYgʻDfUl]ggYa]bUfʻ\Uh _Øfn`]Wk i]a `@UbX_fY]gʻ@]Wk hYbZY`gʻghUhh[YZi bXYbž'j YfUbghU`hYh j ca '5a hgʻZØfʻ9fbÀ\fi b[ž'@UbXk]fhgWk UZh'i bX': cfghYbʻfb9@. Ł 7 cVi f[!?i`a VUWk"'5b`X]YgYa `HU[']bZcfa]YfhYbʻg]Wk '%, @UbXk]fhY`ØVYf`X]Y'j]Y`ZÀ`h][YbʻJ cfhY]`Yʻgck]Y`X]Y < YfUi gZcfXYfi b[YbʻXYfʻK Y]XY\U`hi b[ž'ghYhgʻVY[`Y]hYh'j cbʻXYb : UWk_ca dYhYbnYbʻXYfʻ6]c`UbX!6YfUhYf]bʻl`f]_Y`?cWk`i bX`XYg NUi bVUi Yl dYfhYbʻG]Y[VYfhr@Ja dUfhYf"'8]YgYfʻ5i ghUi gWk`k Uf b]Wk h'bi f``Y\ffY]Wk ž'gcbXYfbʻUi Wk`bchk YbX][ž'i a 'X]Y K Y]XY\U`hi b[']b`NY]hYbʻj cbʻHfcW_Yb\Y]h'i bX': i hhYf_bUdd\Y]h k]fhgWk UZh`]Wk`UhhfU_h]j `ni '[YghU`hYb"

A Uf]bU'5i WkhYf'j ca '59@ '\cV'X]Y'dcg]h]j Yb'9 \mathbb{Z} Y_hY'XYf

K Y]XY\U`hi b[`\Yfj cf"8]YgY`5fh`XYf`H]Yf\U`hi b[`V]YhYh`b]W\h`bi f Y]bY`VYggYfY`: fi W\hVUf_Y]h`i bX`?`Ui Yb[Ygi bX\Y]hž'gcbXYfb`]gh Ui W\`k]fhgW\UZh`]W\`j cfhY]`\UZh"`Gc``Àggh`g]W\`VY]gd]Y`gk Y]gY`X]Y ?cghYbfYW\bi b[`a]h`+\$`?Ø\Yb`]a `@Ui Z\cZžX]Y`fi bX`) +"\$\$\$`9i fc '\A\f`]W\`_cghYbž'[Y[Yb`X]Y`K Y]XY\U`hi b[`a]h`*\$\$`a ‡'dfc`H]Yfž'X]Y bi f`Yhk U`+"\$\$\$`9i fc 'j Yf`Ub[hž'Ui ZqhY``Yb"

$K Y]XY \setminus U^hi b[i bX^H]Yfk c \setminus [a : c_i g]$

8]Y'K Y]XY\U'hi b[']gh'Y]b'k]W\h][Yg'H\Ya Už'XUg'a]h'Y]bYa'\c\YbH]Yfk c\'`Uggcn]]Yfh'k]fX"'8YbbcW\'`YVYb'j]Y'Y'A]'W_Ø\Y k Y]hYf\]b']b'Gh\'Yb"'8Ug'AcXY'`!'i bX'8YacbghfUh]cbgjcf\UVYb JYfVYggYfi b['XYg'H]Yfkc\`g'VY]'K Y]XY\U'hi b['jcb'A]'W_Ø\Yb\Uhi]b'XYb'j Yf[Ub[YbYb'\J\fYb'_f]h]g\WY'?f]hYf]Yb'ZØf'X]Y K Y]XY\U'hi b['Ybhk]\W_Y\h''N]Y\'kUf'Yg\Z'K Y]XY\U'hi b['ni 'Z\OfXYfb\Z'X]Y\'i hhYf!'i bX'K UggYfjYfgcf[i b['ni 'jYfVYggYfb'i bX ['Y]W\nY]h]['X]Y'k]fhg\W\UZh`]\W\YA]'\W\YfnYi [i b['ni 'i bhYfghØhnYb"\D'X]YgYa'?cbhYl h']gh'Ui \W\'X]Y': i hhYfUi ZbU\aY'k]\W\h]['\Z'XYbb'VY]XYf'K Y]XY\U'hi b[']gh'X]YgY'b]\W\h'gc'[i h'_cbhfc``]YfVUf'k]Y']aGhU``\Z'k Ug'a Ub\W\aU'ni i bni fY]\W\YbXYf'6YhfYi i b['ZØ\fYb'_Ubb\Z'gc'Zc_i g!h]Yfkc\`"XY"

8 UgʻDfc Y_hž'XUgʻj cbʻ&\$&%'V]gʻ&\$&' ·`]Y Zžʻ_cbbhYʻXi fWX Yb[Y Ni gUa a YbUfVY]hʻnk]gWX YbʻXYfʻl b]j Yfg]hÀhʻJ YWX hUžʻXYf I b]j Yfg]hÀhʻ; Òhh]b[Ybʻi bXʻXYa i; fØb`UbXnYbhfi a B]YXYfgUWX gYb#6fYa YbʻY"J "'j YfgWX]YXYbYʻ9a dZY\`i b[YbYfUfVY]hYbžʻX]YʻUi Zʻ' \$``UbXk]fhgWX UZh`]WX Ybʻ6Yhf]YVYbʻ[YhYghYhki fXYb"`Ni XYa 'YbhghUbX'Y]bʻi a ZUggYbXYfʻK Y]XY`Y]hZUXYbžʻXYf U`qʻk Yfhj c``Yqʻ<]`Zqa]hhY``ZØfʻ@UbXk]fhY`X]Ybh'

DfU_h]gWXY'H]ddg'ZØf'X]Y'I a gYhni b[

8 Yf 'GYa]bUf `Y]hYf 'G]Y[VYfh '@Ua dUfhYf 'df ÀgYbh]YfhY 'k]Wkh][Y 5gdY_hY 'ZØf 'XYb 'NUi bVUi ž 'XYf 'ZØf 'Y]bY 'YfZc `[fY]Wk Y K Y]XY\U`hi b['i bYf `Agg`]Wk ']gh" '9f 'VYhcbhY 'X]Y 'Bchk YbX][_Y]h 'XYf _cffY_hYb '9fXi b['i bX 'XYf '5i gk U\` 'XYf 'f]Wkh][Yb 'A UhYf]U`]Yb gck]Y 'XYb '9]bgUhn 'j cb '\cWk Yfh][Yb '@]hnYb" '8]YgY 'VUi `]WkYb A U» bU\a Yb 'g]bX 'k]Wkh][ž'i a 'X]Y '? Ø\Y 'g]WkYf 'ni '\U`hYb'i bX

9]b'k Y]hYfYf'dfU_h]gWXYf'5gdY_h'nY][h'g]WX']b'XYf

K UggYfj Yfgcf[i b['XYf'?Ø\Yž'X]Y'hÀ[`]WX']a 'GWXb]hh'+\$'@]hYf

K UggYf'VYbÒh][Yb'i bX'a Ul]a U`'%) \$'A YhYf'V]g'ni f'bÀWXghYb

HfÀb_Y'\UVYb'gc``hYb"'9]b'[i h'Xi fWXXUWXhYg'A UbU[Ya Ybhž'XUg
: i hhYf!'i bX'K UggYfj Yfgcf[i b['a Y]bhž']gh'XYa bUWX'ZØf'X]Y

H]Yf[Ygi bX\Y]h'YbhgWXY]XYbX'i bX'gc``hY'ghYhg'VYXUWXh'k YfXYb"

Ni [i hYf @Yhnh \ UVYb X]Y HY] bY\a Yf XYg GYa]bUfg ni XYa X]Y
A O[`]WX_Y]hz Xi fWX XUg 6UmYf]gWX Y 6Yf[VUi Yfbdfc[fUa a 'j cb : OfXYfi b[Yb 'ni 'dfc Z]h]YfYbz X]Y ii bhYf 'UbXYfYa 'ZØf
< Yf XYbgWXi hnn Ai bY ii bX 'ii b[j]Y\k Y]XYb 'VYfY]h[YghY ``h'k Yf XYb "
8]YgY : Of XYfi b[Yb '_ObbYb 'Y]bYb 'k]WXh][Yb '5bfY]n 'V]YhYbz ii a
X]Y K Y]XY\U`hi b['k Y]hYf ni 'ZOf XYfb ii bX ni 'j Yf VYggYfbz k Ug
gck c\``XYa 'H]Yfk c\``U`g Ui WX 'XYf k]fhgWX UZh`]WX Yb
B UWX\U`h][_Y]h ni [i hY_ca a h" Ni gUa a Yb ZUggYbX '`Aggh g]WX
gU[Yb . '8 U '`]Y[h k Ug 'Ub 'ZØf 'X]Y 'Ni _i bZh ii bgYfYf K Y]XY\U`hi b["

8 YhU]`g	
Cfh	@]WX hY b ZY `gž '8 Y i hgWX `U b X
EiY``Yb	k k k "ZfUYb_]gWXYfhU["XY
	k k k "Zc_i g!h]Yfk c\`"XY
	k k k "[fi Yb`UbXnYbhfi a "cf[

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