

J Z6 Ghi hh[Ufh.; fc» Y < YfUi gZcfXYfi b[VY]a GU]gcbUi ZhU_h b : fY]Vi f[

JZ6 Ghi hh[Ufh ghUfhYh]b : fY]Vi f['a]h HfU]bYf GYVUgh]Ub < cYbY» "'DYfgcbU`ZfU[Yb]b XYf CZZYbg]j Y i bX 8 YZYbg]j Y dfÀ[Yb XUg 8 i Y``"

5a `GUa ghU[ž'XYb `%) "' \$`I \fž'ghY\h`ZØf`XYb`J Z6`Ghi hh[Ufh`Y]b VYXYi hYbXYg`6i bXYg`][U!8i Y```Ub"`8 Ug`HYUa `j cb`HfU]bYf GYVUgh]Ub`<cYbY» `hf]ZZh`Ui Z'XYb`G7`: fY]Vi f[ž'i bX`[`Y]W\`ni 6Y[]bb`XYf`GU]gcb`Yfk UfhYh`X]Y`Gd]Y`Yf`Y]bY`\c\Y<YfUi gZcfXYfi b["'=b`X]YgYa `YfghYb`Gd]Y`hU[`[Y\h`Yg`b]W\h`bi f`i a Di b_hY/Yg`]gh`Ui W\`Y]b`HYghž'k]Y`[i h`g]W\`X]Y`A UbbgW\UZh Ui Z[YghY``h`\Uh`i bX`k Y`W\Y`ghfUhY[]gW\Yb`9bhgW\Y]Xi b[Yb`XYf HfU]bYf`bi b`hfYZZYb`k]fX"

 $6 YgcbXYfg`]bhYfYggUbh`k]fX`X]Y`CZZYbg]j Y`XYg`JZ6`gY]bž`kc < cYbY»`Y]b][Y`dYfgcbY``Y`Cdh]cbYb`\Uh"`8Yb]n`IbXUjž`XYf UiZ[fibX`Y]bYg`HfU]b]b[gfØW_ghUbXg`ni`Yhnh`YhkUg`]a <]bhYfhfYZZYb`kUfž`_ObbhY`Ub`gY]bYf`YfghYb`D`Uhn]Yfib[`]b`XYf GhUfhY`Z`gW\biddYfb":fU[Yb`V`Y]VYb`YXcW\ž`cV`XYf`Gd]Y`Yf`X]fY_h ni`6Y[]bb`fUb`XUfZ`cXYf`cV`Yfž`k]Y`VY]a``YhnhYb`GidYfW'd!Gd]Y`[Y[Yb`6UmYf`@YjYf_igYbž`VYggYf`U`g`<math>x$ _Yf`]b`X]Y`DUfh]Y`[YgW\]W_h k]fX"

8 Y ZY bg]j dfc V`Ya Y`XfØW_Yb`Ui Z`X]Y A UbbgW\UZh

Hfchn XYf: `YI]V]`]hÀh`]b XYf C ZZYbg]j Y ghY\h XYf J Z6 Ghi hh[Ufh`]b XYf 5Vk Y\f'j cf Yfbgh\UZhYb DfcV`Ya Yb" Nk Y] k]W\h][Y 5Vk Y\fgd]Y `Yfž'@Ycb]XUg GhYf[]ci 'i bX 5bh\cbm F ci Ui `hž'ZU``Yb Ui Z[fi bX'j cb 'J Yf`Yhni b[Yb 'ZØf'X]Y '_ca a YbXYb 'K cW\Yb 'Ui g"

GhYf[]ci '_Aa dZh'a]h'Y]bYf'9bhnØbXi b['Ua 'FØW_Ybk]fVY`žk À\fYbX'Fci Ui `h'a]h'Y]bYf'GW\i `hYf`i I Uh]cb'ni '_Aa dZYb'\Uh" 5i W\ 'X]Y'J YfZØ[VUf_Y]h'j cb'MUbb]_'?Y]hY`'i bX'A UI]a]`]Ub A]hhY`ghÀXh']gh'i b[Yk]ggž'k Ug'X]Y'DfcV`Ya Y']b'XYf'8YZYbg]j Y'bcW\ j YfghÀf_h"

8]YgY'dYfgcbY``Yb'9b[dÀggY'nk]b[Yb'<cYbY»'XUni ž'_fYUh]j Y
@Ògi b[Yb'ni 'Z]bXYb"'8Yf'HfU]bYf'\Uh'VYfY]hg'X]Y'HU`YbhY'FUa cb
<YbXf]_g'i bX'5bf]Y'7\UgY'U`g'Cdh]cbYb'ZØf'X]Y'\bbYbj YfhY]X][i b[
]bg'Gd]Y`'[YVfUW\h''K\A\fYbX'X]Y'\b[Yb'Gd]Y`Yf'Zf]gW\Y'9bYf[]Y']b
XUg'HYUa 'Vf]b[Yb'_ObbhYbž']gh'X]Y'I bg]W\Yf\Y]h'ØVYf']\fY
6YfY]hgW\UZh'i bX'9fZU\fi b[']b'gc`W\'Y]bYa 'k]W\h][Yb'Gd]Y`'Y]bY
<YfUi gZcfXYfi b[ža]h'XYf'<cYbY»'i a [Y\Yb'aigg"

 $\pm 0.5 \, bVY \, hfUWX \, hiXYg' \ c \ Yb'B] j \ YUi \ gžiXUg'XYf'G7': fY] Vi \ f[\ 'XUfghY ``hžk \] fX'Yg'Yb hgWXY] XYb X'gY] bžik] Y'[i hiX] Y'Ghi hh[UfhYf'8 YZYbg] j Y Ui Z[YghY``h']gh'' K] fYfk UfhYb'Y] bY'f] WXh]['[fc > Y < YfUi gZcfXYfi b[ž'VYa Yf_hY' < cYbY > 'i bX'j Yfk Y]gh'Ui Z'X] Y GhÀf_Y'XYg'; Y[bYfg''9g'k] fX'] bhYfYggUbh'gY] b'ni 'VYc VUWXhYbž'c V XYf'J Z6'XYb'8 fi W_'VYk À`h][Yb'_Ubb'i bX'k] Y'X] Y'5i ZghY``i b[`YhnhYbX`] WX 'Ui ggY\Yb'k] fX''$

< cYbY» '9bhgWXY]Xi b[Yb i bX GhfUhY[]Yb</pre>

HfU]bYf'GYVUgh]Ub'<cYbY» 'ghY\h'gca]h'j cf'Y]bYf'gdUbbYbXYb 5i Z[UVY"'6Y]'XYf'Ni gUa a YbghY``i b['gY]bYg'? UXYfg'k]fX'Yf gck c\``X]Y'a ca YbhUbY'J YfZUggi b['gY]bYf'Gd]Y`Yf'U`g'Ui W\'X]Y HU_h]_'VYfØW_g]W\h][Yb'a ØggYbž'X]Y'Yf'[Y[Yb'XYb'G7': fY]Vi f[k À\`h"'8]Yg']gh'b]W\h'bi f'YbhgW\Y]XYbX'ZØf'XUg'YfghY'Gd]Y``XYf GU]gcbž'gcbXYfb'_ObbhY'Ui W\'9]bZi gg'XUfUi Z'\UVYbž'k]Y'XUg HYUa 'X]Y'_ca a YbXYb'K cW\Yb'Ub[Y\h"

8]Y'A Ò[`]W_Y]h'j cb'l bXUj ž'g]W\'Ui Z'XYa 'D`Uhn'ni 'VYk Y]gYbž
hfÀi a h'a Ò[`]W\Yfk Y]gY'b]W\h'bi f'j cb'Y]bYa 'ghUf_Yb'GhUfh']b'X]Y
GU]gcbž'gcbXYfb'Ui W\'j cb'Y]bYf'bUW\\U`h]['j YfVYggYfhYb
HYUa `Y]ghi b["'=a ': i » VU``'_Ubb'Y]b'[i hYf'GhUfh'cZh'XYb'FYgh'XYf
GU]gcb'VYY]bZi ggYb"'8]Yg'Vf]b[h'X]Y'J cfZfYi XY'Ui Z'X]Y'DUfh]Y
Ui W\']b'X]Y'FY]\Yb'XYf': Ubgž'X]Y'Ui Z'Y]bY'VYggYfY'D`Uhn]Yfi b['U`g

8]Y'_ca a YbXYb'Gd]Y`Y'k YfXYb'nY][Ybž'k]Y'[i h'g]W\'XYf'J Z6 Ghi hh[Ufh']b'X]YgYf'GU]gcb'gW\`À[h"8cW\'gW\cb'Yhnh'k]fX XYi h`]W\ž'XUgg'X]Y'VY]XYb'9bXYb'XYf'A UbbgW\UZhž'C ZZYbg]j Y'i bX 8YZYbg]j Yž']b'XYb'_ca a YbXYb'HU[Yb']bhYbg]j Yb': c_i g VYbÒh][Yb'k YfXYb"

8]Y Ni gUa a YbghY``i b['XYg'? UXYfg'i bX'X]Y 'ghfUhY[]gWXYb 9bhgWXY]Xi b[Yb'j cb'GYVUgh]Ub' < cYbY» 'g]bX'XYf'GWX`ØggY`ž'i a XYb'YfghYb'G]Y['Y]bni ZU\fYb'i bX'X]Y '5bgdfØWXY'XYg'J YfY]bg'Ui Z Y]b'VYggYfYg'5VgWXbY]XYb']b'X]YgYf'GU]gcb'ni 'i bhYfa Ui Yfb"'9g V`Y]Vh'gdUbbYbXž'k]Y 'g]WX'X]Y 'VY]XYb'A UbbgWXUZhYb']a 'YfghYb 5i ZY]bUbXYfhfYZZYb'XYf'GU]gcb'dfÀgYbh]YfYb'k YfXYb"

± XYf'U_hi Y``Yb'GU]gcb'ghY\h'XYf'JZ6'Ghi hh[Ufh'i bhYf'8fi W_ž'g]W\gW\bY``ni 'ghUV]`]g]YfYb'i bX'X]Y'YfghYb'Di b_hY'ni 'g]W\Yfb"'8]Y
`YhnhY'GU]gcb'\Uh'[YnY][hž'XUgg'Y]b'gW\k UW\Yf'GhUfh'ZUhU`Y': c`[Yb
ZØf'XYb'GU]gcbj Yf`Ui Z'\UVYb'_Ubb"'8Yf'G7': fY]Vi f['k]YXYfi a
\Uh']b'XYf'`YhnhYb'Gd]Y`nY]h'Y]bY'gc`]XY'@Y]ghi b['[YnY][h'i bX'k]fX
j Yfgi W\Ybž'gY]bYb'< Y]a j cfhY]`'Ui gni bi hnYb"

 $8]Y `6Y[Y[bib[`nk]gWXYb`XYa\ `JZ6'ibX`XYa\ `G7':fY]Vif[`]gh'b]WXhbifZØf'X]Y `VY]XYb`A UbbgWX UZhYb`k]WXh][`z`gcbXYfb`gd]Y`h`UiWXY]bY`Fc``Y`]b`XYf'; YgWX]WXhY`VY]XYf'JYfY]bY'':fY]Vif[`\Uhg]WX`]bXYb``YhnhYb`\J\fYb`U`g`Y]bYf'XYf'jYf`Agg`]WXghYb`5iZghY][YfYhUV`]Yfhz`k A\fYbX`Ghihh[Ufh\AiZ][`a]h`@UVY`b`k]Y`5bhkcfh`UiZX]Y`6ibXYg`][U`_cbZfcbh]Yfh`k]fXz`bUWXXYa`aUb`]b`XYfJYf[Ub[Yb\Y]h`aY\fZUWX`Uig`XYf'6ibXYg`][U`UV[Ygh]Y[Yb`]gh''8]Y`JYfY]bgd\]`cgcd\]Yb`ibX`X]Y`ibhYfgWX]YX`]WXYb`5bgAhnY`]aAUbU[YaYbh'_ObbhYb`ZØf`Y]b`gdUbbYbXYg`Gd]Y``gcf[Yb'''$

K]WX h][Y GhUh]gh]_Yb ni a G7 : fY]Vi f[

± `XYf`GU]gcb`&\$&&#&\$&' `Yfn]Y`hY`XYf`G7 :: fY]Vi f[`) (`Di b_hY`i bX `UbXYhY`Ui Z'XYa `) "`D`Uhn`XYf`6i bXYg`][U"`8]Y`A UbbgW\UZh`[`ÀbnhY j cf`U``Ya `Xi fW\`]\fY`[i hY`8YZYbg]j Yž'X]Y`bi f`', `; Y[YbhcfY \]bbY\a Yb`a i gghY"`8]YgY`GhUV]`]hÀh`k]fX`Ui W\`]b`X]YgYa `≯J\f

j cb 'HfU]bYf'7\f]gh]Ub 'GhfY]W\ 'U`g'GW\`ØggY` ni a '9fZc`[
Ub[YgY\Yb"'9g'k]fX']bhYfYggUbh'gY]b 'ni 'VYcVUW\hYbž'k]Y'XYf'J Z6
X]YgY' < YfUi gZcfXYfi b['Ub[Y\hž']bgVYgcbXYfY']b'XYf'5VkY\fž'k c
g]Y'j Yf`Yhni b[gVYX]b[h'[YgW\kÀW\h'g]bX"

9]bY'l a ZfU[Y'i bhYf': Ubg'nY][hž'XUgg'+&i 'j cb']\bYb'cdh]a]gh]gWkg]bXž'XUgg': fY]Vi f['Ui Wk']b'X]YgYf'GU]gcb'Y]bY'À\b`]WkY'@Y]ghi b[k]Y']a 'Jcf'U\f'YfVf]b[Yb'k]fX"'8]Y'Gd]Y`Yf'k YfXYb'a ch]j]Yfh'gY]bž j cf'\Y]a]gWkYa 'Di V`]_i a 'ni 'dYfZcfa Ybž'k Ug'XYb'J Z6'Ghi hh[Ufh i bhYf'8 fi W_gYhnYb'_ObbhY"

Gd]Y`Yf']a : c_i g

9]b`VYgcbXYfYg`5i [Yba Yf_`k]fX`Ui Z`X]Y`@Y]ghi b[`j cb`8Yb]n I bXUj ``]Y[Ybž`XYggYb`:]hbYggni ghUbX`YbhgW\Y]XYbX`ZØf`XYb 9fZc`[`XYg`J Z6`gY]b`_ÒbbhY"`5i W\`X]Y`^i b[Yb`HU`YbhY`F Ua cb <YbXf]_g`i bX`5bf]Y`7\UgY`\UVYb`X]Y`7\UbWYž`g]W\`]b`X]YgYf gW\k]Yf][Yb`G]hi Uh]cb`ni `VYkY]gYb`i bX`kYfhj c``Y`9fZU\fi b[Yb`]b XYf`6i bXYg`][U`ni `gUa a Y`b"

6Y]XY'HYUa g'ghY\Yb'j cf'Y]bYf'GW\`ØggY`dUfh]Yž'X]Y'gck c\``XYbGU]gcbj Yf`Ui Z'U`g'Ui W\`XUg'GY`Vghj YfhfUi Yb'XYf'Gd]Y`YfVYY]bZi ggYb'_ÒbbhY"'<]ghcf]gW\'[YgY\Yb'k Uf'X]Y'YfghYGU]gcb\À`ZhY'ZØf'j]Y`Y'HYUa g'cZh'YbhgW\Y]XYbXž'i a 'XYb; fi bXghY]b'ZØf'Y]bY'YfZc`[fY]W\Y'FØW_fi bXY'ni '`Y[Yb"

8 Y hU]`g

6 Ygi W Yb G]Y i bg Ui Z b!U["XY