

9bhXYW_Yb^G]Y^DUXYfVcfbg^W\Ufa_UbhY^5`hghUXhz^X]Y GW\Ob\Y]h^XYg^HYi hcVi f[Yf^K_U^XYg^i bX^j]Y^Z\A^h][Y _i `hi fY^`Y^<][\`][\hg"^9f^YVYb^G]Y^_i `]bUf]gW\Y^; YbØggY^i bX : Ua_]^]YbUVYbhYi Yf°

K]``_ca a Yb`]b`DUXYfVcfbžY]bYf`GhUXhž'X]Y; YgWk]WkhY`i bX
A cXYfb]hÀh'Ui Z'k i bXYfVUfY`K Y]gY`j YfY]bh' 8]YgY`VYnUi VYfbXY
GhUXh']a '<YfnYb'j cb'BcfXf\Y]b!K YghZU`Yb``ÀXh'Y]b`ni 'Y]bYf
9bhXYW_i b[gfY]gY`Xi fWk']\fY`Y]b`UXYbXY`5`hghUXhž'a U`Yf]gWkY
BUhi f'i bX'_i `hi fY``Y`GWkÀhnY"`DUXYfVcfbž'VY_Ubbh'ZØf'gY]bY
VYY]bXfi W_YbXYb`\]ghcf]gWkYb`GhÀhhYb`i bX`XUg'Y]bn][Ufh][Y': `U]fž
V]YhYh'ni XYa 'Y]bY`J]Y`nU\``Ub'_Ogh`]WkYb`GdYn]U`]hÀhYbž'X]Y`gY`Vgh
X]Y`Ubgdfi Wkgj c``ghYb`; Ui a Yb`YfZfYi Yb`k YfXYb"`\\$\X]YgYa
5fh]_Y``bY\a Yb`k]f`X]Wk'a]h'Ui Z'Y]bY`gdUbbYbXY
9f_i bXi b[ghci fž'X]Y`U``Yg`j cb`XYf`WkUfa UbhYb`5`hghUXh'V]g`\]b`ni
ZUa]`]YbZfYi bX`]WkYb`5i gZ`i [gn]Y`Yb`i a ZUggh"`9[U`ž'cV`Xi
DUXYfVcfb`ni a 'YfghYb`A U``VYgi Wkgh'cXYf`VYfY]hg`Y]b`: Ub`X]YgYf
k i bXYfVUfYb`GhUXh'V]ghž'\]Yf`Z]bXYgh`Xi 'H]ddg'i bX`\\$gd]fUh]cbYb
ZØf`XY]bY`bÀWkghY`FY]gY"`@Ugg'i bg`[Ya Y]bgUa 'X]Y`K i bXYf'j cb
DUXYfVcfb`YbhXYW_Yb`*

9bhXYW_Y`X]Y`WXUfa UbhY`5`hghUXh`jcb DUXYfVcfb

DUXYfVcfbžY]bY'GhUXh']a '<YfnYb'j cb'BcfXf\Y]b!K YghZU`Ybž dfÀgYbh]Yfh'g]W\'a]h'Y]bYf'W\Ufa UbhYb'5`hghUXhž'X]Y'gck c\`; YgW\]W\hY'U`g'Ui W\'a cXYfbYg'@YVYb'j YfY]bh"'8]Y'a U`Yf]gW\Yb GhfU» Yb'i bX'D`ÀhnY'`UXYb'XUni 'Y]bž'Yf_i bXYh'ni 'k YfXYb"'<]Yf Z]bXYh'a Ub'Y]bY'A]gW\ib['Ui g'\]ghcf]gW\Yb'6Ui hYbž'[Ya Øh`]W\Yb

 $7 UZÅg'i bX'Y]bYf'`YV \ UZhYb'5ha cgd \ AfY"'9]bYg'XYf' <][\ `][\ hg']bX]YgYf'5`hghUXh']gh'XYf'8ca 'ni 'DUXYfVcfbž'Y]b'AY]ghYfk Yf_'XYffca Ub]gWXYb'5fWX]hY_hi f"$

8 Yf'DUXYfVcfbYf'8 ca ž'c ZZ]n]Y``VY_Ubbh'U'g' 8 ca 'Gh"'A Uf]Už'Gh" @|Vcf]i g'i bX'Gh"'?]`]Ub ž']gh'b]W\h'bi f'Y]b'fY`][]ÒgYg'NYbhfi a ž gcbXYfb'Ui W\'Y]b'K U\fnY]W\Yb'XYf'GhUXh"'GY]bY VYY]bXfi W_YbXYb'HØfa Y'g]bX'gW\cb'j cb'K Y]hYa 'g]W\hVUf'i bX n]Y\Yb'X]Y'6Ygi W\Yf'a U[]gW\'Ub"'8Yf'8 ca 'VY\YfVYf[h'Y]bY J]Y`nU\`'j cb'?i bghk Yf_Yb'i bX'\]ghcf]gW\Yb'FY`]_hYbž'XUfi bhYf XYb'VYfØ\a hYb' 8 ca gW\Uhn ž'XYf'a]hhY`U'hYf`]W\Y'GW\AhnY i a ZUggh"'9g'`c\bh'g]W\ž'Ub'Y]bYf'XYf'[YZØ\fhYb'Hci fYb hY]`ni bY\a Ybži a 'a Y\f'ØVYf'X]Y'fY]W\Y'; YgW\]W\hY'XYg'8 ca g'ni YfZU\fYb"

9]b'k Y]hYfYf'fY]nj c``Yf'Cfh']b'XYf'5`hghUXh']gh'XYf'A Uf_hd`Uhn'''<]Yf di `g]Yfh'XUg'@YVYb'XYf'GhUXhž'VYgcbXYfg'k À\fYbX'XYf K cWXYba Àf_hYž'X]Y'fY[Y`a À»]['ghUhhZ]bXYb'''8]Y'Vi bhYb'GhÀbXYV]YhYb'Zf]gWXY'DfcXi _hY'Ui g'XYf'FY[]cbž'j cb'CVgh'i bX'; Ya ØgYV]g'\]b'ni '\UbX[Ya UWXhYb'GdYn]U`]hÀhYb'''8]Y'i a `]Y[YbXYb\]ghcf]gWXYb'; YVÀi XYž'k]Y'XUg'U`hY'FUh\Ui gž'j Yf`Y]\Yb'XYa 'D`UhnY]bY'VYgcbXYfY'5ha cgd\ÀfY'''8Yf'6`]W_'Ui Z'XYb'A Uf_hd`Uhn']gh'Y]bdYfZY_hYf'D`Uhnž'i a 'VY]'Y]bYf'HUggY'? UZZYY'X]Y'GYY`Y'VUi a Y`b'ni`UggYb''

- $<]ghcf]gWXY'; YVÀi XY.'5`hY'FUh\Ui gž'?U]gYfdZU`nY$
- \bullet GY\Ybgk ØfX][_Y]hYb. '8ca 'ni 'DUXYfVcfbž'K UggYfhi fa
- $5_h]j]hAhYb. GhUXhZØ\fib[YbžFUXZU\fYb'XifWX'X]Y$ 5`hghUXh

9]b'6i a a Y`Xi fW\X]Y'5`hghUXh'V]YhYh'ni XYa 'X]Y'A Ò[`]W_Y]hž _`Y]bY'6ci h]ei Yb'i bX'; YgW\ÀZhY'ni 'YbhXYW_Ybž'X]Y'fY[]cbU`Y DfcXi _hY'i bX'?i bgh\UbXk Yf_'j Yf_Ui ZYb'''<]Yf'Z]bXYh'a Ub'U``Yg j cb'hfUX]h]cbY``Yf'?YfUa]_'V]g'\]b'ni '\UbX[YZYfh][hYa 'GW\a i W_" 8]Y']bX]j]Xi Y``Yb'@\XYb'hfU[Yb'ni f'`YV\UZhYb'5ha cgd\ÀfY DUXYfVcfbg'VY]'i bX'\Y'ZYbž'X]Y'`c_U`Y'; Ya Y]bgW\UZh'ni i bhYfghØhnYb'''J]Y`Y'; YgW\ÀZhY'g]bX']b'\]ghcf]gW\Yb'; YV\Ai XYb i bhYf[YVfUW\hžk Ug'XUg'9]b_Ui ZYb'ni 'Y]bYa 'VYgcbXYfYb'9f`YVb]g

9]b'k Y]hYfYg'<][\`][\h']gh'X]Y' DUXYf ž'XYf': `i ggž'XYf'Xi fW\'X]Y 5 hghUXh'Z]Y» h" 5b gY]bYb'l ZYfb'[]Vh'Yg']Xm``]gW\Y'GdUn]Yfk Y[Yž X]Y'Yg'XYb'6Ygi W\Yfb'Yfa O[`]W\Ybž'X]Y'BUhi f'ni '[Yb]Y» Ybž k À\fYbX'g]Y'X]Y'GhUXh'Yf_i bXYb"'9bh`Ub['XYf'DUXYf'ghY\Yb nU\`fY]W\Y'6Àb_Y'i bX'_`Y]bY'; fØbZÀW\Ybž'X]Y'Y]b`UXYbž'Y]bY DUi gY'Y]bni `Y[Yb'i bX'X]Y'l a [YVi b['Ui Z'g]W\'k]f_Yb'ni '`UggYb" 8]Y'Y]bn][Ufh][Y': `cfU'i bX': Ui bU'fi bX'i a 'XYb': `i gg'j YfghÀf_h XYb'7\Ufa Y'XYf'5`hghUXh'i bX'V]YhYh'Y]bYb'Yf\c`gUa Yb'?cbhfUgh ni a '[YgW\ÀZh][Yb'HfY]VYb']b'XYb'GhfU» Yb"

 $8]Y \cdot 5 \cdot hghUXh'j \cdot cb \cdot DUXYfVcfb']gh'Ui \cdot W \cdot _i \cdot hi \cdot fY \cdot \cdot U_h]j \cdot "\cdot NU \setminus fY]WXY \\ J \cdot YfUbghU \cdot hi \cdot b[Yb \cdot Z]bXYb \cdot XUg'[UbnY \cdot JU \setminus f'\emptyset VYf'ghUhhž'i \cdot bX'j]Y \cdot Y'j \cdot cb] \setminus bYb'_cbnYbhf]YfYb'g]WX']b' XYb' \]ghcf]gWXYb'; \ YVÀi \ XYb' i \ bX'Ui \ Z \ XYb'D`\AhnYb''' J \ cb'? \ cbnYfhYb'\ØVYf'? i \ bghUi \ gghY``i \ b[Yb'V]g'\]b'ni \ : YghYb'i \ bX'A \ Af_hYb''' Yg'[]Vh']a \ a \ Yf'Yhk \ Ug'ni \ 'Yf`YVYb'''8]Y \ GhUXhj \ Yfk \ U`hi \ b['i \ bX'`c_U`Y'\#\]h]Uh]j \ Yb'cf[Ub]g]YfYb'fY[Y`a \ A`\][9j \ Ybhgž'X]Y'gck \ c\``9]b\Y]a \]gWXY'U`g'Ui \ W \ 'Hci \ f]ghYb'Ubn]Y\Yb''$

GY\Ybgk ØfX][_Y]h	6YgW\fY]Vib[² ZZbi b[gnY]hYb
8 ca 'ni 'DUXYfVcfb	9]b^AY]ghYfkYf_^XYf	HÀ[`]W.'+.\$\$'
	Fca Ub]_'a]h	%, .\$\$`I \f
	VYY]bXfi W_YbXYb	
	?ibghgWNAhnYb"	
5`hYg'FUh\Uig	<]ghc f]gW\ Y g	A c!: f. '\$\$' '%+.\$\$
	; YVÀi XYž XUg c Zh U`g	l ∖f
	JYfUbghU`hib[gcfh	
	[Ybihnhk]fX"	
?U]gYfdZU`nY	<pre><]ghc f]gWX Y 'GhÀ hhY</pre>	8]!Gc.'%\$.\$\$' '%*.\$\$
	a]h': Ø\fi b[Yb'ni f	l ∖f
	; YgWX]WXhY'XYf	
	GhUXh"	

5VgWX`]Y» YbX``Àggh`g]WX`gU[Ybž`XUgg`X]Y`WXUfa UbhY`5`hghUXh`j cb DUXYfVcfb`a]h`]\fYb`\]ghcf]gWXYb`GY\Ybgk ØfX][_Y]hYbž``YV\UZhYb A Àf_hYb`i bX`[Ya Øh`]WXYb`D`ÀhnYb`Y]b`i bj Yfn]WXhVUfYf`HY]``'YXYf FY]gY`]b`X]YgY`GhUXh`]gh"`9[U`ž`cV`a Ub`g]WX`ZØf`; YgWX]WXhY

]bhYfYgg]YfhžX]Y``c_U`Y`?i`hif`Yf`YVYb`cXYf`Y]bZUW\`bif`X]Y 5hacgd\ÀfY`[Yb]Y»Yb`aÒW\hY``DUXYfVcfbg`5`hghUXh`\Uh`ZØf YXYb`YhkUg`ni`V]YhYb"`9g`]gh`Y]bY`9]b`UXib[ž`X]Y`GYY`Y`XYf`GhUXh ni`YbhXYW_Yb`ibX`ibjYf[Ygq`]W\Y`9f]bbYfib[Yb`ni`qUaaY`b"

BUhi f'di f. '8]Y'GW\Òb\Y]h'XYg'HYi hcVi f[Yf K U`XYg

8 Yf 'HYi hc Vi f[Yf 'K U`X 'YfghfY W_h 'g] W 'a U 'YghÀh]gW 'ØVYf 'X Ug '@Ub X B c f Xf \ Y]b! K YghZU`Yb 'i b X 'V]YhYh 'Y]bY 'UhYa VYfUi VYb XY '? i `]ggY ZØf 'B Uhi f Zf Yi b X 'K Ub XYf Yf ž 'X]Y 'X]Y 'GW Òb \ Y]h 'X Yf XYi hgW Yb '@Ub XgW UZh 'Yf `YVYb 'a ÒW hYb "'DUXYf Vc f b ž 'U`g 'Hc f 'ni X]YgYa 'VYY]b X fi W_Yb XYb 'B Uhi f d Uf UX]Ygž ']gh 'XYf ']XYU`Y 5 i g[Ub [gdi b_h 'ZØf '9f_i b X i b [ghci f Yb 'i b X 'C i h X c c f! 5_h]j]hÀhYb"

± XYf'FY[]cb'[]Vh'Yg'Y]bY'J]Y`nU\`'j cb'K UbXYfk Y[Ybž'X]Y'g]WX Xi fWX'X]WXh'VYk U`XYhY'5fYU`Yž'a U`Yf]gWXY'HÀ`Yf'i bX UhYa VYfUi VYbXY'5i gV`]W_Y'gWX`Àb[Y`b"'9]b][Y'XYf'VY`]YVhYghYb K UbXYfk Y[Y'g]bX.

- 9[[YkY[...9]b.***_a ...Ub[Yf.K UbXYfkY[ž.XYf.Xi fW.X]Y UVkYW.g.i b[gfY]W.Y.@UbXgW.UZh.XYg.9[[Y[YV]f[Yg.ZØ\fh"8Yf.KY[...V]YhYh.j]Y.Y.5i gg]W.hgdi b_hY.a]h.gdY_hU_i ...AfYb DUbcfUaYb"
- < Yfa Ubbgk Y[...8]YgYf'VYfØ\a hY'K UbXYfk Y['YfghfYW_h g]W\'ØVYf'%) * '_a 'i bX'j YfV]bXYh'XUg'\Ø[Y`][Y'; YV]Yh'XYg HYi hcVi f[Yf'K U`XYg'a]h'XYa 'GhUXh[YV]Yh'j cb'6]Y`YZY`X" 9f']gh'VY_Ubbh'ZØf'gY]bY'Y]bXfi W_gj c``Yb': Y`gZcfa Uh]cbYb"
- DUXYfVcfbYf'< Ò\Ybk Y[...'9]bY'_ØfnYfY'Fci hY'j cb'WU"
 "_a ž'X]Y']XYU`'ZØf': Ua]`]Yb'i bX'k Yb][Yf'YfZU\fYbY K UbXYfYf']ghi bX'YVYbZU``g'hc``Y'5i gV`]W_Y'V]YhYh"

8]Y:: `cfU'i bX': Ui bU'XYg'HYi hcVi f[Yf'K U`XYg']gh'YVYbZU``g
VYa Yf_Ybgk Yfh":8Yf'K U`X']gh'<Y]a Uh'j]Y`Yf'gY`hYbYf
DZ'UbnYbUfhYb'i bX'H]Yfdcdi `Uh]cbYb"'6Y]'Y]bYa 'GdUn]Yf[Ub[
Xi fWX'X]Y'BUhi f'_Ubb'a Ub'\Ài Z]['FY\Yž'K]`XgWXkY]bY'i bX
Y]bY'J]Y`nU\``j cb'JÒ[Y`b'VYcVUWXhYb"'8]Y'FY[]cb']gh'VYgcbXYfg
]a :: fØ\`]b['i bX'Gca a Yf'Y]b'VY`]YVhYf'FØW_ni [qcfh'ZØf

9]b k Y]hYfYg'<][\`][\h'XYf'FY[]cb']gh'X]Y A $O[\]$ W_Y]hž'\]ghcf]gWXYGhÀhhYb ni 'Yf_i bXYb"'Gc'_ObbYb K UbXYfYf'Ui Z']\fYa 'K Y['Xi fWXXYb'HYi hcVi f[Yf'K U'X'gdUbbYbXY'; YgWX]WXhYb'ØVYf'X]YfY[]cbU`Y'; YgWX]WXhY'i bX'A mh\Yb'YbhXYW_Yb"'9]b'VYgcbXYfgVY_UbbhYg'N]Y`']gh'XUg'< Yfa UbbgXYb_a U`ž'XUg'XYb7\Yfi g_YfZØfghYb'5fa]b]i g'Y\fhž'k Y`WXYf'i a 'XUg'\J\f'-'b"'7\f''X]Y'fOa]gWXYb'@Y[]cbYb']b'XYf'GWX`UWXh']a 'HYi hcVi f[Yf'K U`XVYg]Y[hY''

Ni gàhn`]WX 'V]YhYh`XYf`HYi hcVi f[Yf`K U`X`\Yfj cffU[YbXY A Ò[`]WX_Y]hYb`ZØf`UbXYfY`Ci hXccf!5_h]j]hàhYb"`F UXZU\fYf`Z]bXYb\]Yf`Y]b`i a ZUb[fY]WXYg`BYhn`j cb`F UXk Y[Ybž`X]Y`gck c\``ZØf[Ya Øh`]WXY`Hci fYb`U`g`Ui WX`ZØf`Ubgdfi WXgj c``YfY`F ci hYb[YY][bYh`g]bX"`9]b][Y`Ya dZY\`Ybgk YfhY`GhfYW_Yb`g]bX.

- FibXhcifia 'XYb'[fc» Yb'GWX]YXYfgYY.'9]bY
 a U'Yf]gWXY'&) '_a '`Ub[Y'GhfYW_Yž'X]Y'ia 'XYb
 kibXYfgWX Ob'Ub[Y'Y[hYb'GWX]YXYfgYY'ZØ\fh"
- HYi hcVYf[Yf'FUXk Y[.'9]b'[i h'Ui g[YVUi hYf'FUXk Y[ž XYf'Y]b][Y'\]ghcf]gWXY'GhÀXhY'UbghYi Yfh'i bX'Y]bY'@Ab[Y j cb', *'_a '\Uh"

5_h]j]hÀh	6YgWXfY]Vib[9a dZc\`YbY'NY]h
K UbXYfb	9f_i bXYb G]Y Y]bYg	& * Ghi bXYb
	XYf'nU\`fY]WXYb	
	K UbXYfk Y[Y`]b`XYf	
	FY[]cb"	
FUXZU\fYb	; Yb]Y»Yb'G]Y'X]Y	%) Ghi bXYb
	BUhi f'Ui Z'Y]bYa 'XYf	
	FUXk Y[Y"	
BUhifVYcVUW\hib[6YcVUWXhYb^G]Y	JUf]]Yfh
	H]YfY'i bX'DZUbnYb	

5_h]j]hÀh	6YgWkfY]Vib[9a dZc\`YbY`NY]h	
]b^]\fYf^bUhØf`]W\Yb		
	la[YVib["		

\$\delta \text{Yb is a `]Y[YbXYb 'C fhYb '[]VhYg 'ni XYa 'nU\`fY]W\Y';

\$\text{Ughfcbca]YVYhf]YVY\delta X]Y 'hfUX]h]cbY``Y 'k YghZ\delta `]gW\Y'?\OW\Y

\$UbV]YhYb ''Y]bY 'dYfZY_hY'; Y`Y[Yb\Y]h\delta g]W\'bUW\'Ui g[YXY\bhYb

\$5_h]j]h\delta hYb 'ni 'gh\delta f_Yb''8]Y 'gW\ a UW_\UZhYb 'fY[]cbU`Yb

\$\text{Yf]W\delta hY i bX'X]Y 'bYhhY '5 ha cgd\\delta fY ``UXYb 'XUni 'Y]b\delta Yb

\$YbhgdUbbhYb 'HU['Ui g_`]b[Yb 'ni '`UggYb''

\$\delta \text{Yb} \text{Yb} '\delta \text{Yb} '\delta Yb'' \text{Yb} '\delta Yb''

\$\delta \text{Yb} '\delta \text{Yb} '\delta \text{Yb} '\delta Yb'' \text{Yb} '\delta Yb''

\$\delta \text{Yb} '\delta \text{Yb} '\delta Yb'' \text{Yb} '\delta Yb''

\$\delta \text{Yb} '\delta \text{Yb} '\delta Yb'' \text{Yb} '\delta Yb''' \text{Yb} '\delta Yb'' \text{Yb} '\delta Yb'' \text{Yb} '\delta Yb''' \text{Yb} '\delta Yb'''' \text{Yb} '\delta Yb'''' \text{Yb} '\delta Yb''' \text{Yb} '\delta Yb''' \text{Yb} '\delta Yb'''

Ni gUa a YbZUggYbX``Àggh'g]W\`gU[Ybž'XUgg`XYf'HYi hcVi f[Yf'K U`X a]h'gY]bYb'j]Y`ZÀ`h][Yb': fY]nY]ha Ò[`]W_Y]hYbž'Y]bXfi W_gj c``Yf B Uhi f'i bX'fY]W\Yf'; YgW\]W\hY'Y]b'k U\fYg'DUfUX]Yg'ZØf'Ci hXccf! 9bh\i g]UghYb'i bX'B Uhi fZfYi bXY']gh'' D`UbYb'G]Y' \Rightarrow fYb'6Ygi W\']b DUXYfVcfb'i bX'Yf_i bXYb'G]Y'X]YgY'k i bXYfgW\`ObY'FY[]cb'gY`Vgh''

?i`hifgW\AhnY.'AigYYb'ibX'\]ghcf]gW\Y GhAhhYb']b'XYf'FY[]cb

8]Y'FY[]cb'DUXYfVcfb']gh'b]W\h'bi f'ZØf']\fY'a U'Yf]gW\Yb @UbXgW\UZhYb'i bX'W\Ufa UbhYb'5`hghUXhghfU» Yb'VY_Ubbhž'gcbXYfbUi W\'ZØf'Y]bY'J]Y`nU\`'Yfgh_`Ugg][Yf'AigYYb'i bX'\]ghcf]gW\YfGh\hhYbž'X]Y'X]Y'?i `hi f'i bX'; YgW\]W\hY'XYf'GhUXh'`YVYbX][k YfXYb'`UggYb''<]Yf']gh'Y]bY', VYfg]W\h'ØVYf'Y]b][Y'XYfVXYi hYbXghYb'_i `hi fY``Yb'<][\`][\hgž'X]Y'6Ygi W\Yf'g]W\h\Ybh[Y\Yb'`UggYb'gc``hYb"

%"DUXYfVcfb AigYiag`UbXgW\UZh

8]Y'A i gYi a g`UbXgW\UZh']b'DUXYfVcfb'V]YhYh'Y]bY VYY]bXfi W_YbXY'5i gk U\`'Ub'9]bf]W\hi b[Ybž'X]Y'j YfgW\]YXYbY 5gdY_hY'XYf'?i bgh'i bX'; YgW\]W\hY'UVXYW_Yb"'8Uni '[Y\OfYb.

- 8 UgʻA i gYi a ']bʻXYfʻ? U]gYfd ZU`n. '9]bʻ\]ghcf]gWkYg A i gYi a žʻXUgʻg]Wkʻa]hʻXYfʻ; YgWk]WkhYʻXYfʻGhUXh DUXYfVcfbʻVYZUgghʻi bXʻ5fhYZU_hYʻUi gʻj YfgWk]YXYbYb 9dc WkYbʻdfÀqYbh]Yfh"
- 8 Ug'8]ÒnYgUba i gYi a . '<]Yf'_ÒbbYb'6Ygi WXYf
 VYXYi hYbXY'K Yf_Y'XYf'?]fWXYb_i bghi bX'GUa a `i b[Yb
 Ui g'XYf'FY[]cb'VYk i bXYfbž'XUfi bhYf'FY`]ei]UfY'i bX
 `]hi f[]gWXY'CV'Y_hY"
- 8 Ug 'H\YUhYf'DUXYfVcfb. 'BYVYb'_`Ugg]gWXYb
 5i ZZØ\fi b[Yb'V]YhYh'XUg'H\YUhYf'Ui WX'gdUbbYbXY
 5i gghY``i b[Yb'ØVYf'X]Y'9bhk]W_`i b['XYf'XUfghY``YbXYb

&" <]ghc f]gWX Y GhAhhYb

DUXYfVcfb \ Uh'Y]bY'fY]WXY'; YgWX]WXhYž'X]Y']b'j]Y`Yb'gY]bYf \]ghcf]gWXYb'GhÀhhYb'ZYgh[Y\U`hYb'k]fX"'9]bY'FY]\Y'j cb VYXYi hYbXYb'CfhYb'YfnÀ\`h'X]Y'; YgWX]WXhYb'j Yf[Ub[YbYf 9dcWXYb.

- 8]Y?U]gYfdZU`n. 8]YgYg'VYY]bXfi W_YbXY'6Ui k Yf_'k Uf Y]bgh'XYf'G]hn'XYf'?U]gYf'i bX'\Uh'gckc\`'UfW\]hY_hcb]gW\ U`g'Ui W\`\]ghcf]gW\'Y]bY'nYbhfU`Y'6YXYi hi b['ZØf'X]Y'GhUXh''
- 8 Y f '8 ca 'ni 'DUXYfVcfb.' 9]b 'A Y]ghYfk Yf_ XYf fca Ub]gWXYb '5 fWX]hY_hi fž XUg'a]h gY]b Yb UhYa VYfUi VYbXYb 'HØfa Yb'i bX XYf dfÀWXh][Yb \dip bYbUi gghUhhi b['Y]b 'A i gg' ZØf' 'YXYb '6 Ygi WXYf']gh"
- 8]Y'U`hY'GhUXha Ui Yf.'HY]`Y'XYf'a]hhY`U`hYf`]W\Yb GhUXhVYZYgh][ib['g]bX'\YihY'bcW\'Yf\U`hYb'ibX'V]YhYb Y]bYb'gdUbbYbXYb'9]bV`]W_']b'X]Y'\]ghcf]gW\Y JYfhY]X][ib[gUfW\]hY_hif"

' "?i bgh i b X ?i `hi f]a : c_i g

 $DUXYfVcfb^{\circ}]gh^{\circ}UiWX^{\circ}Y]b^{\circ}NYbhfia^{\circ}Z\emptyset f^{\circ}?ibgh^{\circ}ibX^{\circ}?i^{\circ}hif^{\circ}*8]Y^{\circ}GhUXh^{\circ}YfUbghU^{\circ}hYh^{\circ}fY[Y^{\circ}a^{\circ}A^{\circ}][^{\circ}5igghY^{\circ}ib[Yb\check{z}^{\circ}X]Y^{\circ}gckcV^{\circ}c_U^{\circ}Y^{\circ}U^{\circ}gUiWX^{\circ}]bhYfbUh]cbU^{\circ}Y^{\circ}Z0fXYfb.$

- ?i bghj YfY]b DUXYfVcfb. '9]b]bbcj Uh]j Yf Cfhžk c nY]h[YbÒgg]gWXY ?i bgh]a '8]U`c['a]h XYa 'Di V`]_i a 'ghY\h"
- GhUXhV]V`]ch\Y_`DUXYfVcfb.`BYVYb`6ØW\Yfb`[]Vh`Yg \]Yf`fY[Y`a À»]['_i `hi fY``Y`JYfUbghU`hi b[Ybž'@Ygi b[Yb i bX'?i bghUi gghY``i b[Yb"
- 8]Y '>JnnZUVf]_. '9]b 'VY`]YVhYg'J YfUbghU`hi b[gnYbhfi a 'ZØf >Jnn! i bX'?i `hi fj YfUbghU`hi b[Yb'gck]Y 'ZØf'K cf_g\cdg"

("?i `hi fY``Y J YfUbghU`hi b[Yb

8 Ugʻ[UbnYʻ\J\fʻØVYfʻZ]bXYbʻ]bʻDUXYfVcfbʻY]bYʻJ]Y`nU\``j cb _i `hi fY``YbʻJYfUbghU`hi b[YbʻghUhhž'X]Yʻgck c\``9]b\Y]a]g\W\Y`U`g Ui \W\`Hci f]ghYbʻUbn]Y\Yb"'9]b][YʻXYfʻVYghYbʻA Ò[`]\W_Y]hYbž'X]Y `c_U`Yʻ?i `hi fʻ_YbbYbni `YfbYbžʻg]bX.

8]Y DUXYfVcfbYf @]Vcf]. '9]b 'UVk YWkg'i b[gfY]WkYg GhUXhZYghž XUg'b]Wkh'bi f'_i `]bUf]gWkYž gcbXYfb 'Ui Wk _i `hi fY``Y'<][\`][\hg'V]YhYhž XUfi bhYf'5i Zhf]hhY'j cb Aig]_Yfb'i bX'? Øbgh`Yfb"

- 8 UgʻDUXYfVcfb: Ygh]j U`. '9]bY'a Y\fhÀ[][Y': Y]YfʻXYf Aig]_'i bX'?i bghžʻX]Y'cZh`]b'j YfgWX]YXYbYb'HY]`Yb'XYf GhUXh'qhUhhZ]bXYh"
- 8 Y f 'K Y]\bUW\hga Uf_h. '9]b 'a U[]gW\Yg '9f`YVb]g 'a]h fY[]cbU`Yb '< UbXk Yf_ggh\bXYbž'@j Y!A i g]_'i bX _i `hi fY``Yb '8 UfV]Yhi b[Yb"

) " 5_h]j]hÀhYb ZØf; YgWX]WX hgZfYi bXY

; YgWX]WX hg]bhYfYgg]YfhY '_ObbYb 'VY]'j YfgWX]YXYbYb'[YZØ\fhYbHci fYb']b'X]Y 'ZUgn]b]YfYbXY'J Yf[Ub[Yb\Y]h'DUXYfVcfbgY]bhUi WXYb"'9]b][Y'Ya dZY\`Ybqk YfhY'Hci fYb'q]bX.

- GhUXhZØ\fi b[Yb. '9fZU\fYbY'; i]XYg'bY\a Yb'6Ygi W\Yf
 a]h'Ui Z'9bhXYW_i b[gfY]gY'ni 'XYb'k]W\h][ghYb
 \]ghcf]gW\Yb'Gh\Ah\Yb'XYf'GhUXh"
- FibX[Ab[Y'ni 'XYb'DUXYfVcfbYf'GU[Yb.'9f_ibXYbG]Y'X]Y'[Y\Y]ab]gjc``Y'GY]hY'XYf'GhUXh'a]h'Y]bYf K UbXYfib['ni 'XYb'gU[YbiakcVYbYb'CfhYb"
- 6Ygi WX Y ']b 'XYb '\]ghcf]gWX Yb '; YVÀi XYb. 'FY[Y`a À»][
 [YÒZZbYhY '\]ghcf]gWX Y '; YVÀi XY 'V]YhYb 'Y]bYb '9]bV`]W_ ']b
 X]Y '5fWX]hY_hi f'i bX 'XYb '@YVYbggh]` 'j Yf[Ub[YbYf
 ***J\f\i bXYfhY"

* " A i gYYb ZØf X]Y [UbnY : Ua]`]Y

DUXYfVcfb'V]YhYh'Ui W\'nU\`fY]W\Y'ZUa]`]YbZfYi bX`]W\Y'A i gYYbž X]Y'?]bXYfb'i bX'9fk UW\gYbYb'[\`Y]W\Yfa U Yb'GdU 'a UW\Yb"'9]b dUUf'Hcd!9a dZY\`i b[Yb'g]bX.

- 8 Ug' < Y]bn'B]I XcfZ'A i gYi a g: cfi a . '8 Ug' [fÒ» hY
 7 ca di hYfa i gYi a 'XYf'K Y`hž'XUg'X]Y '9bhk]W_`i b['XYf
 DZcfa Uh]cbghYW\bc`c[]Y'Ui Zi bhYf\U`hgUa Y'K Y]gY'nY][h"
- 8 Ug ?]b X Y f! i b X ' i [Y b X a i g Y i a . ' A]h ']b h Y f U_h]j Y b 5 i ggh Y ` i b [Y b ž X]Y ?]b X Y f b ' g d]Y ` Y f]g W ' X]Y ; Y g W] W h Y i b X ? i b q h b À \ Y f V f]b [Y b "
- 8 Ug'A i gYi a 'ZØf'B Uhi f_i bXY.'<]Yf'_ÒbbYb'6Ygi WXYf
 a Y\f'ØVYf'X]Y'H]Yf!'i bX'DZUbnYbk Y`h'XYf'FY[]cb
 YfZU\fYb'i bX'gdUbbYbXY'5i gghY``i b[Yb'Yf`YVYb"

?i`]bUf]gWXY; YbØggY. 8]Y VYghYb FYghUi fUbhg i bX GdYn]U`]hÀhYb

DUXYfVcfbžX]Y`W\Ufa UbhY`GhUXh`a]h`]\fYf`\]ghcf]gW\Yb`5`hghUXh i bX`XYf`gW\ObYb`l a [YVi b[žV]YhYh`b]W\h'bi f`_i `hi fY``Y $< \ralign{align*} & < \ralign* \raisetimes for the continuous and the continuous formula of the c$

9]b 'UVgc`i hYg'A i gg']gh'8 Ug'_`Y]bY'FYghUi fUbhž'XUg'ZØf'gY]bY _fYUh]j Y'XYi hgWXY'? ØWXY'VY_Ubbh']gh'' <]Yf'k YfXYb'Zf]gWXYž fY[]cbU`Y'Ni hUhYb'j YfUfVY]hYh'i bX']b'a cXYfb']bhYfdfYh]YfhYb; Yf]WXhYb'gYfj]Yfh''DfcV]YfY'Ui Z'_Y]bYb': U```XUg'FY\Z]`Å'a]h DZ]ZZYf`]b[Ybž'XUg'\]Yf'VYgcbXYfg'[YgWXÀhnh'k]fX"'8 Ug [Ya Øh']WXY'5a V]YbhY'a UWXh'Yg'ni a 'dYfZY_hYb'Cfh'ZØf'Y]b YbhgdUbbhYg'8]bbYf"

K Ybb Xi 'Ui Z'XYf'Gi WXY'bUWX 'Yhk Ug'5i » Yf[Yk Ò\b`]WXYa 'V]ghž gc``hYgh'Xi 'XUg'Gi g\] / 'A cfY'VYgi WXYb"'8]YgYg'FYghUi fUbh V]YhYh'Y]bY 'ZUgn]b]YfYbXY'A]gWXi b['Ui g'hfUX]h]cbY``Yf''UdUb]gWXYf ?@WXY'i bX'a cXYfbYb '\bhYfdfYhUh]cbYb"'8]Y'5``!Mci !7Ub!9Uh! Gi g\]!5i gk U\``Yfa Ò[`]WXh'Yg'XYb'; ÀghYbž'j YfgWX]YXYbY'Gi g\]!GcfhYb'i bX''UdUb]gWXY'GdYn]U`]hÀhYb'ni 'dfcV]YfYb"'8]Y'`]YVYj c``ni VYfY]hYhYb'; Yf]WXhY'g]bX'Y]b'k U\fYf'; Ybi gg'ZØf'X]Y'G]bbY"

9]b'k Y]hYfYg'F YghUi fUbhž'XUg'Zf]gWXY'Ni hUhYb'i bX'Y]bY'_fYUh]j Y ? ØWXY'j YfY]bhž']gh'F YghUi fUbh'5`h'DUXYfVcfb"'<]Yf'k YfXYb fY[]cbU`Y'GdYn]U`]hÀhYbž'k]Y'X]Y'DUXYfVcfbYf'? Ufhc ZZY`gi ddYž gYfj]Yfh"'\db'Y]bYa 'fi gh]_U`Yb'5a V]YbhY'_Ubbgh'Xi 'X]Y'VYghYb 5fca Yb'XYf'FY[]cb'[Yb]Y»Yb"'5i WX'Y]bY'[fc»Y'5i gk U\`'Ub K Y]bYb'Ui g'XYf'I a [YVi b['fi bXYh'XUg'_i `]bUf]gWXY'9f`YVb]g'UV"

 $\label{lem:ccx-ca} GhfYYh: ccX'_ca a h']b'DUXYfVcfb'YVYbZU``g'b]Wkh'ni '_i fn°`8Yf': ccX'Hfi W_'DUf_']gh'YXYb': fY]hU[']a 'Gca a YfY]b'k U\fYf < chgdch'' <]Yf'Z]bXYgh'Xi 'Y]bY'f]Yg][Y'5i gk U\``Ub'j YfgWk]YXYbYb GdY]gYb'' j cb']bhYfbUh]cbU`Yb'? Ògh`]Wk_Y]hYb'V]g'\]b'ni fY[]cbU`Yb'GbUW_g''; Yb]Y<math>^*$ Y']bYb'6Yf`]bYf'8 ÒbYf'cXYf'Y]bY Dcfh]cb'Dca a Yg'a]h'GdYn]U`gc * Y']a ': fY]Ybž'k À\fYbX'Xi 'XUg Vi bhY'HfY]VYb'VYcVUWkhYgh''

8]Y'HfUX]h]cb'XYf'6fUhk i fgh'\Uh']b'DUXYfVcfb'Y]bYb
VYgcbXYfYb'GhY``Ybk Yfh"'5b'j YfgWX]YXYbYb'GhÀbXYb']b'XYf'GhUXh
_Ubbgh'Xi 'X]Y'VYfØ\a hY'DUXYfVcfbYf'6fUhk i fgh'dfcV]YfYb"
6YgcbXYfg'X]Y'DUXYfVcfbYf'7i ffmk i fgh']gh'Y]b'VY`]YVhYf'GbUW_
i bhYf'9]b\Y]a]gWXYb'i bX'Hci f]ghYb"'9g']gh'XYf'dYfZY_hY'GbUW_
bUWX'Y]bYa '`Ub[Yb'HU['jc``Yf'9f_i bXi b[Yb"

9]b k Y]hYfYf; Y\Y]a h]dd]gh X]Y DUXYfVcfbYf $^{\circ}$ 6fUi YfY]ž X]Y b]Wk h bi f _\Ogh]Wk Yg $^{\circ}$ 6]Yf $^{\circ}$ VfUi hž gcbXYfb $^{\circ}$ Ui Wk Y]b Y]b \UXYbXYg F YghUi fUbh \(^{\circ}VYhfY]Vh" $^{\circ}$ 7]Yf _Ubbgh \(^{\circ}Xi \(^{\omega}Y fgWk]Y XYbYb 6]Yfgcfh Yb \(^{\omega}7]b $^{\circ}$ C fh \(^{\omega}6]YfYb "8]Y $^{\circ}$ 6fUi a Y]gh Yfd \(^{\omega}1h j YfgWk]Y XYbYb $^{\circ}$? \(^{\omega}7)b][_Y]h Yb \(^{\omega}k]Y $^{\circ}$ 8 AgY \(^{\omega}6 bX K i fgh \(^{\omega}7]b Y hc \(^{\omega}7 6Y[\(^{\omega}7]h b[\(^{\omega}1)b Ya \(^{\omega}7]gWk \(^{\omega}7 Y 1b Yb \(^{\omega}8]Y \(^{\omega}7 Ag \(^{\omega}8]Y \(^{\omega}8 Ag \(^{\omega}9 Ag \(^{\omega}) Ag \(^{\omega}8 Ag \(^{\omega}8 Ag \(^{\omega}8 Ag \(^{\omega}) Ag \(^{\omega}8 Ag \(^{\omega}8 Ag \(^{\omega}) Ag \(^{\omega}8 Ag \(^{\omega}) Ag \(^{\omega}8 Ag \(^{\omega}) Ag \(^{\omega}8 Ag \(^{\omega}) Ag \(^{\omeg

K Ybb'Xi 'bUW\'gØ\'Yb'?Ògh`]W_Y]hYb'5i ggW\Ui '\À`hghž``c\bh'g]W\ Y]b'6Ygi W\'VY]'7UZ\^GW\YfYbVYf["8]YgYg'hfUX]h]cbgfY]W\Y'7UZ\^V]YhYh'X]Y'VYghYb'DUXYfVcfbYf'A i ZZ]bg'i bX'Y]bY'J]Y`nU\`UbXYfYf'; YV\^W_gcfhYb"'9]b'GhØW_'XYf'VYfØ\a hYb'DUXYfVcfbYf < c\W\nY]hghcfhY'fi bXYh'XY]bYb'6Ygi W\'dYfZY_h'UV"

<]Yf Z]bXYghXi Y]bY , VYfg]WXh ØVYf Y]b][Y XYf VYghYb F YghUi fUbhg]b DUXYfVcfb.

FYghUifUbh	6YgcbXYf\Y]h	9a dZc\`YbY
		GdYn]U`]hÀh
8 Ug'_`Y]bY	?fYUh]jY'XYihgW\Y	FY\Z]`Å a]h
FYghUi fUbh	?ØWXY	DZ]ZZYf`]b[Yb
F]ghcfUbhY'8U'J]bW]	5i h\Ybh]gW\Y	<ui g[ya="" td="" uw\hy<=""></ui>
]hU`]Yb]gW\Y'; Yf]W\hY	FUj]c`]
Gig\]/ A cfY	*JdUb]gWXY '? ØWXY	5``!Mci!7Ub!9Uh!
		Gi g\]
FYghUi fUbh'5`h	FY[]cbU`Y	DUXYfVcfbYf
DUXYfVcfb	GdYn]U`]hÀhYb	? Ufhc ZZY`gi ddY
:ccX'Hfi W_'DUf_	J]Y`ZU`h'Ub'GhfYYh	6Yf`]bYf'8ÒbYf
	: ccX	
DUXYfVcfbYf	Ui g[YVfUi hYg⁻6]Yf	6fUi a Y]ghYfd`UhhY
6fUi YfY]		
7 UZÅ 'GWX Y fY b V Y f[GØ» Y '6UW_k UfYb	DUXYfVcfbYf
		< c Wk nY]hghcfhY

⇒ DUXYfVcfb Z]bXYghXi 'U`gc Y]bY: Ø``Y 'Ub [Ughfcbca]gWXYb
< Ò\Ydi b_hYbžX]Y 'YXYb : Y]bgWXa YW_Yf VY[Y]ghYfb XØfZhYb "CV
Xi 'Ui Z'XYf Gi WXY 'bUWX 'Y]bYa 'ZY]bYb '8]bbYfžY]bYa 'gWXbY``Yb
GbUW_cXYf Y]bYf 'gØ» Yb 'J YfZØ\fi b['V]gh ']b 'X]YgYf 'GhUXh 'k]fX
</p>

YXYf`ZØbX]["'JYfgÀi a Y`b]W\hž`X]Y`_i`]bUf]gW\Yb`; YbØggY DUXYfVcfbg`k À\fYbX`XY]bYg`bÀW\qhYb`6Ygi W\g`ni 'YbhXYW_Yb°

J YfUbghU`hi b[Yb i bX : YghY. DUXYfVcfbg <][\ `][\ hg]a '>U\fYgj Yf`Ui Z

DUXYfVcfbžY]bY'GhUXhjc``Yf'; YgWX]WXhY'i bX'7\Ufa YžV]YhYh']a \$\lambda\fYgj Yf`Ui ZY]bY'J]Y`nU\``j cb'JYfUbghU`hi b[Yb'i bX': YghYbž'X]Y
9]b\Y]a]gWXY'i bX'6Ygi WXYf'[`Y]WXYfa U»Yb'Ubn]Y\Yb"'8]YgY
9j Ybhg'g]bX'Y]bY'[fc»Ufh][Y'; Y`Y[Yb\Y]hž'X]Y'?i `hi f'XYf'GhUXh\Ui hbU\'ni 'Yf`YVYb'i bX'g]WX'a]h'XYb'A YbgWXYb'ni 'j YfbYhnYb"

Jbi Uf V]g A Afn. K]bhYfnUi VYf i bX ? UfbYj U`

9]b'k Y]hYfYg'<][\`][\h']gh'XYf'DUXYfVcfbYf'? UfbYj U`ž'XYf']b'XYf FY[Y`]a : YVfi Uf'[YZY]Yfh'k]fX"A]h'Vi bhYb'l a nØ[Yb'i bXZfÒ\`]W\Yb': YghYb'Vf]b[h'X]YgYf'5b`Ugg'X]Y'GhUXh'ni a '@YVYb"'G]Y _\ObbYb'X]Y'j YfgW\]YXYbYb'J YfUbghU`hi b[Yb']a 'GhUXhnYbhfi a i bX'XYb'i a `]Y[YbXYb'GhUXhhY]`Yb'[Yb]Y» Yb"

AcbUh	JYfUbghU`hi b[8 Uhi a
*Jbi Uf	BYi ~U\fg_cbnYfh	%"`IJbi Uf
: YVfi Uf	DUXYfVcfbYf	JUf]YfYbX
	?UfbYj U`	

5df]`V]g' \Rightarrow b].': fØ\`]b[gZYgh'i bX'GhUXhZYgh

 $= a : f\emptyset \ `]b[`V`\emptyset \ h`DUXYfVcfb`b]Wkh'bif']b : UfVYžgcbXYfb`Ui Wk']b : Ygh`]Wk_Y]hYb" `8 Ug': f\emptyset \ `]b[gZYghža Y]gh']a : 5df]`ž']gh'Y]b`VY`]YVhYg 9j Ybhž'k c`G]Y'j]Y`Y``c_U`Y`DfcXi_hYž' < UbXk Yf_g_i bgh'i bX : Ughfcbca]Y`Yf`YVYb`_ObbYb" `8]Y`ZYgh`]Wk`[YgWka <math>\emptyset W_hYb$ `GhÀbXY`UXYb`ni a `6i a a Y`b`Y]bž'k À\fYbX`X]Y`?]bXYf`X]Y`nU\`fY]WkYb 5hhfU_h]cbYb`i bX`: U\f[YgWk ÀZhY`[Yb]Y`*Yb"

9]b'k Y]hYfYg'<][\`][\h']a 'Gca a Yf']gh'XUg'GhUXhZYghž'XUg hmd]gWXYfk Y]gY']a '⇒ b]'ghUhhZ]bXYh"'6Y]'@j Y!Aig]_ž HUbnUi ZZØ\fib[Yb'ibX'_i`]bUf]gWXYb'GdYn]U`]hÀhYb'Yf`YVYb'G]Y X]Y'DUXYfVcfbYf'; UghZfYibXgWXUZh']b'jc``Yb'NØ[Yb"'<]Yf'g]bX Y]b][Y'XYf'5 h]j]hÀhYbž'X]Y'G]Y'Yfk UfhYb' ÒbbYb. '@j Y!?cbnYfhY'j cb'`c_U`Yb'i bX'fY[]cbU`Yb'?Øbgh`Yfb
'?i bgh!'i bX'<UbXk Yf_Yfa Àf_hY
'@YW_YfY]Yb'j cb'`c_U`Yb'; Ughfcbca]YVYhf]YVYb</pre>

 \dot{s} `] `V]g `GYdhYa VYf. `CdYb!5]f!J YfUbghU`hi b[Yb'i bX`DUXYfVcfbYf8ca ZYghgd]Y`Y

 $8] Y `G ca a Y fa cbUhY `g] b X `Ui W. `X] Y `NY] h `ZØ f `CdYb! 5] f! \\ J Y f UbghU`hi b [Yb `] b `DUXY f V cfb" `8 Y f `DUXY f V cfb Y f `8 ca ž Y] b \\ V Y Y] b X fi W_Y b X Y g `K U\fnY] W. Y b `XY f `GhUXhž `] gh `c Zh `GW. Ui d`Uhn `j cb ? cbnY fhY b `i b X : Y gh] j U`g`] a `: fY] Y b " 8] Y `8 ca Z Y ghgd] Y`Y`] a `5 i [i gh g] b X `V Y g cb X Y f g `V Y`] Y V h `i b X `V] Y h Y b `Y] b `f Y] W. \U`h] [Y g `Df c [f Ua a a] h'_`Ugg] g W. Y f `A i g]_ž `H \Y UhY f Ui Z Ø \fi b [Y b `i b X `] b h Y f U_h] j Y b K cf_g \cdg"$

8]Y'GhUXh'`Àggh'g]W\']b'X]YgYf'NY]h'Ui W\'j cb'XYb Gca a Yf[Yk]hhYfb'b]W\hii bhYf_f]Y[Ybži bX'X]Y'J YfUbghU`hi b[Ybn]Y\Yb'hfchn'<]hnY'j]Y`Y'6Ygi W\Yf'Ub"'<]Yf'_ÒbbYb'G]Y'gck c\``X]Y A i g]_'U`g'Ui W\'X]Y'UhYa VYfUi VYbXY'I a [YVi b['[Yb]Y»Yb"

 $C_hcVYfV]g^8YnYaVYf.KY]\bUWhgaUf_hiibXG]^jYghYfZY]Yf$

8 Yf' < YfVgh'Vf]b[h'X]Y'Yf[fY]ZYbXY'DUXYfVcfbYf' < YfVgha YggYž Y]bY'HfUX]h]cbž'X]Y': fØW\hY'i bX'\UbXk Yf_`]W\Y'? Ògh`]W_Y]hYb']b Y]b'ZYgh`]W\Yg'@]W\h'hUi W\h''8]YgY'JYfUbghU`hi b[']gh'Y]bY'hc``Y A Ò[`]W_Y]hž'XYb' < YfVgh']b'j c``Yb'NØ[Yb'ni'[Yb]Y»Yb'i bX'g]W\ a]h'XYb'`c_U`Yb'DfcXi_hYb'Y]bni XYW_Yb"

9]bYb'_fÒbYbXYb'5VgWX\i gg'XYg'\J\fYg'V]\XYh'XYf

K Y]\bUWXhga Uf_h']b'XYf'DUXYfVcfbYf'5`hghUXh''A]h'ZYgh`]WX
[YgWXa ØW_hYb'GhÀbXYb'i bX'Y]bYf'k Ufa Yb'5ha cgd\ÀfY']gh'X]YgYf

A Uf_h'Y]b'A i gg'ZØf'U``Yž'X]Y'ZYgh`]WXY'Gh]a a i b['[Yb]Y»Yb

a ÒWXhYb''<]Yf'_ÒbbYb'G]Y.

'5b'; `Ø\kY]b'i bX'[YVfUbbhYb'A UbXY`b'b]ddYb
'KY]\bUW\h`]W\Y'; YgW\Yb_Y'i bX'8Y_c'_Ui ZYb
'8]Y'k i bXYfj c``Yb'@]W\hgd]Y`Y'i bX'X]Y'ZYgh`]W\'VY`Yi W\hYhYb
; UggYb'VYk i bXYfb

8]Y'G]`j YghYfZY]Yf']b'DUXYfVcfb'gWX`À[h'XYb'dYfZY_hYb', VYf[Ub[]bg'bYi Y'\\f"8]Y'6Yk c\bYf'j YfgUa a Y`b'g]W\'Ui Z'XYa <Ui dhd`Uhnž'i a 'XUg'U`hY'\\f'a]h'A i g]_ž'HUbn'i bX': Yi Yfk Yf_ j YfUVqWX]YXYb"'

: Un]h. ; Ubn'[`Y]W\ ž'ni 'k Y`W\ Yf'\\ fYgnY]h'G]Y 'DUXYfVcfb VYgi W\ Yb \check{z} X]Y 'GhUXh'\ Uh'\\ Z\ f'\ YXYb 'Yh\ Ug'ni 'V]Yh\Yb" \ 8]Y

: Ua]`]YbZfYi bX`]W\Y'5i gZ`i [gn]Y`Y. 'GdU» 'ZØf ; fc» 'i bX'? `Y]b

DUXYfVcfb']gh'b]W\h'bi f'ZØf'gY]bY'\]ghcf]gW\Y'5`hghUXh'i bX'X]Y
i a `]Y[YbXY'BUhi f'VY_Ubbhž'gcbXYfb'Ui W\'ZØf'gY]bY'J]Y`nU\`'Ub
ZUa]`]YbZfYi bX`]W\Yb'5i gZi [gn]Y`Yb"'9[U`ž'cV'Xi 'Y]bYb'HU['j c``Yf
5VYbhYi Yf']b'XYf'BUhi f'cXYf'_i `hi fY``Y'9f`YVb]ggY'a]h'XYb
?`Y]bYb'gi W\ghž\]Yf'k]fX'YXYf'ZØbX]["'@Ugg'i bg'[Ya Y]bgUa 'X]Y
VYqhYb'N]Y`Y'YbhXYW_Yb'

%"DUXYfVcfbYfNcc

9]b'6Ygi W.']a 'DUXYfVcfbYf'Ncc']gh'Y]b'Aigg'ZØf': Ua]']Yb"'A]h
ØVYf'+\$\$'H]YfYb'Uig'%) \$'jYfgWX]YXYbYb'5fhYb']gh'X]Yg'XYf']XYU'Y
Cfh'ZØf'H]Yf']YV\UVYf'YXYb'5`hYfg"'8]Y'6Ygi WXYf'_ÒbbYb'b]WXh'bif
X]Y'H]YfY'\UihbU\'Yf'YVYbžgcbXYfb'UiWX'Ub'gdUbbYbXYb
: Ø\fib[Yb'ibX': ØhhYfib[Yb'hY]`bY\aYb"'6YgcbXYfg'X]Y
GhfY]WXY`nccq'q]bX'Y]b'<]h'VY]'XYb'_`Y]bYb'; ÀghYb"

- ² ZZbi b[qnY]hYb. 'HÀ[`]WX'|cb'-' '%, 'l \f
- 9]bhf]hhqdfY]gY.'', '9fk UWXgYbYž'') '?]bXYf'fk!%('\\fY\)
- 6YgcbXYf\Y]hYb. Gd]Y`d`AhnYi bX`D]W_b]W_a O[`]WX_Y]hYb
 j cf\UbXYb

&"DUXYfgYY

8 Yf'DUXYfgYY']gh'Y]b'k Y]hYfYf'VY`]YVhYf'C fh'ZØf': Ua]`]Yb"'9f'V]YhYh Y]bY'k i bXYfgWX ÒbY'?i `]ggY'ZØf'5_h]j]hÀhYb'k]Y'6cchZU\fYbž 5b[Y`b'cXYf'Y]bZUWX 'bi f'YbhgdUbbYb'Ua 'I ZYf"'8]Y'I a [YVi b[']gh]XYU``ZØf'YbhgdUbbYbXY'GdUn]Yf[Àb[Y'cXYf'Ui ZfY[YbXY : U\ffUXhci fYb"'5i » YfXYa 'k YfXYb']a 'Gca a Yf'cZh J YfUbghU`hY b[Yb'i bX': Ygh]j U`g'Ua 'GYY'j YfUbghU`hYh"

5_h]j]hÀhYb Ua DUXYfgYY.

- 6cchgj Yf`Y]\
- K UbXYf! i bX F UXk Y[Y
- ?]bXYfgd]Y`d`ÀhnY'X]fY_h'Ua 'K UggYf

' "'? `YhhYfk U`X DUXYfVcfb

 $: \emptyset f^*X]Y^*UVYbhYi Yf^*i gh][Yb^*: Ua]^*]Yb^*]gh^*XYf^*? ^YhhYfk U^*X^*DUXYfVcfb XYf^*dYfZY_hY^*Cfhz^*i a ^X]Y^*BUhi f^*ni ^Yf_i bXYb^*i bX^*g]W^*gdcfh^*]W^*ni VYhAh][Yb^*'<]Yf^*_ObbYb^*?]bXYf^*i bX^*9fk UW^*gYbY^*]b^*j YfgW^*]YXYbYb DUfWci fg^*_^YhhYfb^*i bX^*]\fY^*; YgW^*]W_^*]W^*_Yh^*i bX^*A i h^*i bhYf 6Yk Y]g^*ghY^*Yb^*'; i]XYg^*ghY\Yb^*VYfY]hz^*i a ^G]W^*Yf\Y]h^*i bX^*GdU^*ni [UfUbh]YfYb"$

5 `hY f	DUfWci fg	8Ui Yf
5V.*. Al/ th	9]bghY][Yf	%!&GhibXYb
5V.%\$.77/ LAND	: cfh[YgWXf]hhYb	&!' 'Ghi bXYb
5V.%(\J\tVp	91 dYfhY	'!('GhibXYb

("K YghZA`]gWXYg: fY]`]WX ha i gYi a

9]b k Y]hYfYg'<][\`][\h'ZØf': Ua]`]Yb]gh'XUg'K YghZÀ`]gW\Y
: fY]`]W\ha i gYi a ']b '8 Yha c`Xž'bi f'Y]bY'_i fnY'5i hcZU\fh'j cb

DUXYfVcfb 'YbhZYfbh'' <]Yf'_ObbYb 'X]Y '6Ygi W\Yf']b 'X]Y

J Yf[Ub[Yb\Y]h'Y]bhUi W\Yb i bX 'XUg'`ÀbX`]W\Y @YVYb 'ZfØ\YfYf

NY]hYb '_YbbYb`YfbYb" 8 Ug'A i gYi a 'V]YhYh'nU\`fY]W\Y
A]ha UW\Ub[YVchYž'X]Y 'VYgcbXYfg'ZØf'?]bXYf'UbgdfYW\YbX'g]bX"

5 hhfU_h]cbYb]a : fY]`]WX ha i gYi a .

- JcfZØ\fib[Yb'jcb'<UbXkYf_ghfUX]h]cbYb
- 6Ui Yfb\cZ5_h]j]hÀhYb ZØf?]bXYf
- GU]gcbU`Y : YghY i bX J YfUbghU`hi b[Yb

) "7YbhfY DUf_ < cWx gUi Yf`UbX

: Øf'Y]bYb'dYfZY_hYb': Ua]`]Ybi f`Ui V'V]YhYh'g]W\ XYf'bU\Y[Y`Y[YbY7YbhfY'DUf_'<cW\gUi Yf`UbX'Ub"A]h'gY]bYb'FY]\Yb\Ài gYfbžY]bYa[fc»Yb'GW\k]a a VUX'i bX'i a ZUb[fY]W\Yb': fY]nY]ha Ò[`]W_Y]hYbž]gh'X]YgYf': Yf]YbdUf_'Y]bY'hc``Y'Cdh]cb'ZØf'Y]bYb'?i fnhf]d"'Jcb

♣bXccf!Gd]Y`d`ÀhnYb'V]g'ni 'K Y``bYggUb[YVchYb'ZØf'X]Y'9`hYfb'\]Yf'_ca a h'X]Y'[UbnY': Ua]`]Y'Ui Z']\fY'?cghYb"

9W_XUhYb ni a '7YbhfY'DUf_.

- I bhYf_ØbZhY.: Yf]Yb\ài gYf'ZØf'&!%&'DYfgcbYb
- 5_h]j]hÀhYb. `A]b][c`Zž'HYbb]gž'GWkk]a a Yb 'i bX'j]Y`Yg a Y\f
- 6YgcbXYf\Y]hYb. '?]Xg!7`i V'ZØf'X]Y'?`Y]bYb

* " 8]bcgUi f]Yf!DUf_ A ØbWXY\U[Yb

9]b 'gd UbbYbXYg'N]Y` 'ZØf'_`Y]bY '9bhXYW_Yf']gh'XYf'8]bcgUi f]Yf!DUf_A ØbWXY\U[Ybž'k c'[fc»Y'i bX'_`Y]bY'6Ygi WXYf']b'X]Y'K Y`h'XYf8]bcgUi f]Yf'Y]bhUi WXYb'_ObbYb"'A]h'`YVYbg[fc»YbBUWXV]`Xi b[Yb'i bX']bhYfU_h]j Yb'5i gghY``i b[Yb'k]fX'XYf'DUf_nia'i bj Yf[Ygg`]WXYb'9f`YVb]g'ZØf'X]Y'[UbnY': Ua]`]Y"

<][\`][\ hg]a '8]bcgUi f]Yf!DUf_.</pre>

- VYf &' \$ 8]bcgUi f]Yfg_i `dhi fYb
- ; fUVYb bUW YW hYb : cgg]`]Yb
- Gd]Y`Y\fdZUX`ZØf`?]bXYf

DUXYfVcfb i bX gY]bY I a [YVi b['V]YhYb Y]bY 'VfY]hY 'DU`YhhY 'Ub ZUa]`]YbZfYi bX`]WX Yb '5hhfU_h]cbYbž'X]Y gck c\``6]`Xi b['U`g'Ui WX GdU» 'ZÒfXYfb"'9[U`ž'cV']\f'Yi WX 'ZØf'H]YfYž'5VYbhYi Yfž'; YgWX]WXhY cXYf'BUhi f']bhYfYgg]Yfh ']b 'DUXYfVcfb'_ca a h'YXYf'Ui Z'gY]bY ?cghYb"'DUW_h'Yi fY': Ua]`]Y'Y]b'i bX'Yf_i bXYh'X]Y'nU\`fY]WXYb A Ò[`]WX_Y]hYb'XYf'FY[]cb'

8 Y hU]`q

6Ygi WXYb G]Y i bg Ui Z Y]bY!fY]gY "XY