GYWΛ g`Y]XYbXY ; c`XYb!F Yhf]Yj Yf!K Y`dYb Ui g`]`Y[ U`Ya `HfUbgdcfh'[YfYhhYh

Nc`ZU\ bXYf`j]b`<YggYb`fYhhYb`gYWΛ g`a]gg\ UbXY`hY`K Y`dYb
j cf`XYf`<i bXY!A UZ]U"8]Y`H]YfY`k YfXYb`Yhnh`]a `H]Yf\Y]a
VYhfYi h"

⊕`Y]bYf`YfgWΛ ØhhYfbXYb`9bhXYW\_i b[ `UVYb`Nc`ZU\ bXYf`Ua
: fY]hU[a cf[Yb`Ui ZXYf`5' `VY]`K Y]g_]fWΛ Yb`]b`<YggYb`Y]bYb
]`Y[ U`Yb`K Y`dYbhUbgdcfh`Ui Z[ Y\_`Àfh"G YWΛ g`\_Y]bY ; c`XYb!
F Yhf]Yj Yf!K Y`dYbž[ YfUXY`Y]ba U`UWΛ h`K cWΛ Yb`U`hž`k UfYb`]b
Y]bYa`fi a`Àb]gWΛ Yb`HfUbgdcfhYf`i bhYf`gWΛ`]a a Yb`6YX]b[i b[Yb
Y]b[YdZYfWΛ h"8]Y`YfgWΛ ÒdZhYb`H]YfVUV]Yg`k UfYb`g]WΛ hVUf[Yei`À`h
i bX`\_]hhYb`i bhYf`:`Ò\Ybž`k À\fYbX`XYf`VY]» YbXY ; YghUb`_j cb`l f]b
i bX`?ch`XYb`HfUbgdcfhYf`Xi fWΛ nc["

8]Y`9fa ]hhYf`k UfYb`j cb`XYf`VYXUi Yf`]WΛ Yb`G]hi Uh]cb`XYf`K Y`dYb
Yl hfYa`VYhfcZZYb"6Y]`XYf`?cbhfc`Y`XYg`: U\fnYi [g`k i fXY`X]Y
U`Ufa ]YfhY`5a hgh]YfÀfnh]b`\]bni [ Ync[ Yb"ÀfY`l bhYfgi WΛ i b[
VYghÀh][hY`XYb`gWΛ`YWΛ hYb` ; Ygi bX\Y]hgni ghUbX`XYf`H]YfYž`X]Y
b]WΛ h`bi f`_fÀb`\_]WΛ`k UfYbž`gcbXYfb`Ui WΛ`Y]b`c\Yg`F ]g]\_c`ZØf
?fUb`\_Y]hYb`a]h]g]WΛ`VY[ `Y]hYhYbž`X]Y`Ui ZUbXYfY`H]YfY
ØVYfhfU[Yb`k YfXYb`_ØbbhYb"

GWΛ cW_]YfYbXY ; Ygi bX\Y]hgni ghÀbXY`XYf K Y`dYb

5b[Yg]WΛ hg`XYf`Yfbgh\UZhYb` ; Ygi bX\Y]hgf]g]\_Yb`k Uf`Yg`b]WΛ h
Ub[YVfUWΛ hž`X]Y`K Y`dYb`]b`Y]b`fY[i`ÀfYg`H]Yf\Y]a`ni`Vf]b[Yb"
8U\Yf[f]ZZ`XUg`J YhYf]bÀfUa`h`XYg`?fY]gYg`C ZZYbVUWΛ`Y]b`i bX
_Øa a YfhY`g]WΛ`i a`X]Y`K Y]hYfj Yf`Y[ i b[ "B UWΛ`]bhYbg]j Yf`Gi WΛ Y
_cbbhY`XUg`H]Yf\Y]a`]b`5gWΛ UZZYbVi f[žYhk U` \$`?]`ca YhYf

YbhZYfbhž[Yk cbbYb`k YfXYbž`X]Y`K Y`dYb`b`]\fYf
E i UfUbhÅbYghUh]cb`Ui Zni bY`a Yb`"8cfh`k i fXYb`X]Y`_Y]bYb
; c`X]Yg`Ua`B UWX a`]hU[`[ fØbX`]WX`[ Yk UgWXYb`i bX`a`YX]n]b]gWX
j Yfgcf[h"

8]Y`6YZF]ji b[ `XYf`K Y`dYb`Ui g`XYf`a`]gg`]WXYb`@U[Y`]gh`b]WX`h`bi f
Y]b`]bX]j ]Xi Y`Yf`9fZc`[ž`gcbXYfb`k]fZiUi WX`Y]b`@]WX`h`Ui ZXUg
U`Ufa`]YfYbXY`DfcV`Ya``XYg`]`Y[U`Yb`K Y`dYb`UbXY`g`]b
8Yi hgWX`UbX`"8]YgYf`Vcca`YbXY`A Uf`_hž`Åi Z][ `VYnY]WX`bYh`U`g
K Y`dYb`!A UZ]U`ž`Vf]b[h`b]WX`h`bi f`Y]XYbXY`H]YfY`Yfj`cfž`gcbXYfb
ghY`h`Ui WX`Y]bY`[fc»Y`<YfUi gZcfXYfi b[ `ZØf
H]YfgWX`i hncf[ Ub]gUh]cbYb`XUf"

; fi bX`U[ Yb`XYg`]`Y[U`Yb`K Y`dYb`UbXY`g

8]Y`H]YfgWX`i hncf[Ub]gUh]cb`J]Yf`DZchYb``VYf]WX`hYhj`cb`XYb
YfgWX`fYW`YbXYb`NU`Yb`ZØf`&\$&'`" `ϕ`X]YgYa``ϕ]\f`k i fXYb
Vi bXYgk Y]h`VYfY]hg`, \$` `<i bXY`i bX`() `? UhnYb`g]WX`Yf[ YghY`hž`X]Y
cZiUi g`C`ghYi fcdU`ghJa`a`Yb`i bX`ØVYf`XUg`ϕ`hYfbYh`j Yf`_Ui Zh
k YfXYb`"8Yf`]`Y[ U`Y`<UbXY`a`]h`K Y`dYb`i bX`F`UggY`_UhnYb
Zcf]Yfhž`i bX`X]Y`H]YfY`VYnU`Yb`XYb`DfY]g`ZØf`XUg`i bYh`]gWX`Y
; YgWX`ÅZhg`a`cXY`"9g`]gh`U`Ufa`]YfYbXž`k ]Y`j]Y`Y`H]YfZF]i bXY
i bk]ggYb`h]WX`Ui ZX]YgY`A UWX`YbgWX`UZhYb`YfY]bZU`Ybž`]bXYa`g]Y
j Yfa`Y]b`h]WX`Y`GWX`b`AddWX`Yb`]a`BYhn`gi`WX`Yb"

8]Y`K Y`dYb`Ui g`K`Y]g\_]fWX`Yb`XØfZhYb`]b`XYb`_ca`a`YbXYb`K`cWX`Yb
k]YXYf`[ Ygi bX`k YfXYbž`i bX`gcVU`X`g]Y`j`c`ghÅbX][ `[Y]a`dZi`g]bXž
gc`Yb`g]Y`ni`f`5Xcdh]cb`ZF]Y][Y[VYVb`k YfXYb`"ϕ`Y]bYf`]YVYj`c`Yb
l`a`[YVi b[`\_ØbbYb`g]Y`YbX`]WX`XUg`[`ØW\_]WX`Y`@YVYb`ZØ`fYbž`XUg
]\bYb`j`cb`; YVi fh`Ub`ni`ghY`h`"8]Y`YfghY`[fc»Y`<ØfXY`UVYb`X]Y
_Y]bYb`; c`X]Yg`VYfY]hg`ØVYfk`i bXYb"

9g`V`Y]Vh`YXcWX`ni`c`ZYbž`XUgg`X]YgY`i bXUb`_VUfY`; YgWX`]WX`hY
j]Y`Y`A`YbgWX`Yb`XUni`Ub`fY[ hž`_ØbZh][`[ YbUi`Yf`]bni`gY`Yb`i bX
g]WX`VYk`i`ggh`[Y[Yb`XYb`]`Y[ U`Yb`H]Yf`UbXY`Y]bni`gY`hnYb`"8]Y
h]Yfa`YX]n]b]gWX`Y`j`Yfgcf[i b[`i bX`F`Yhhi`b[`X]YgYf`_Y]bYb`K`YgYb
]gh`XYf`YfghY`GWX`f]hž`i`a`Y]b`VYggYfYg`GWX`]W`gU`ZØf`j ]Y`Y`UbXYfY
H]YfY`ni`g]WX`Yfbž`X]Y`]b`XYb`; Åb[ Yb`XYf`K`Y`dYb`!A`UZ]U`ghY`W`_Yb"

8YhU]g

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