

*`i I i f]ÒgY`F Y]gY[YgWk Yb_Yž`X]Y`k]f`
]YVYb

A UbWk a U`gWk YfnYb`a Y]bY` ; YgWk k]ghYfž`XUgg`XUg`
bUWk \U`h][ghY`J Yfa`ÀWk hb]g`i bgYfYg`j YfghcfVYbYb`J UhYfg`i
bgYfY`i bYfV]h`]Wk Y`Gcf[Y`i a`X]Y` ; UgfYWk bi b[`gY]b`k]fX`
`b`Y]bYa` <Ui g\U`h`a`]h`UWk h`?]bXYfb`[UV`Yg`
9]bgWk fÀb`_i b[Ybž`k]Y`Ub[Y`k]f`XYb`6c]`Yf`Y]b[YgWk U`hYh`
`UggYb`_cbbhYbž`i a`K UggYf`ni`Yf\]hnYbž`k]Y`Ub[Y`i bgYfY`
6ÀXYf`XUi Yfb`_cbbhYbž`k]Y`Ub[Y`k]f`F Y]g]b`XYf`GdØ`Y`
UVhfc dZYb`UggYb`_cbbhYbž`c`bY`XUg`Yb hgd fYWk YbXY`
?cWk ZY`X`Ui gni gWk U`hYb`fYhk U`ZØbZ`GY`_i bXYbŁ`"i gk`"9g`
ØVYffUgWk h`b]Wk hž`XUgg`X]YgY` ; Yk c`b`Y]hYb`V]g]bg`
9fk UWk gYbYbU`hYf`6YghUbX`\UhYb`"5`g`YhnhYg`J\`f]b`XYa`
_Y]bYb`ZfUnØg]gWk Yb`8cfZž]b`XYa`k]f`k c`b`hYbž`XYf`K]bhYf`
\YfY]bVfUWk ž`k Uf`]Wk`Yb hgYhnhž`U`g]Wk`YfZ` \fž`XUgg`k]f`X]Y`
/ Ua`d^Y`d/

A UbWk a U`gWk YfnYb`a Y]bY` ; YgWk k]ghYfž`XUgg`XUg`bUWk \U`h][ghY`
J Yfa`ÀWk hb]g`i bgYfYg`j YfghcfVYbYb`J UhYfg`i bgYfY`i bYfV]h`]Wk Y`
Gcf[Y`i a`X]Y` ; UgfYWk bi b[`gY]b`k]fX`"

`b`Y]bYa` <Ui g\U`h`a`]h`UWk h`?]bXYfb`[UV`Yg`9]bgWk fÀb`_i b[Ybž`
k]Y`Ub[Y`k]f`XYb`6c]`Yf`Y]b[YgWk U`hYh`UggYb`_cbbhYbž`i a`
K UggYf`ni`Yf\]hnYbž`k]Y`Ub[Y`i bgYfY`6ÀXYf`XUi Yfb`_cbbhYbž`k]Y`
`Ub[Y`k]f`F Y]g]b`XYf`GdØ`Y`UVhfc dZYb`UggYb`_cbbhYbž`c`bY`XUg`
Yb hgd fYWk YbXY`?cWk ZY`X`Ui gni gWk U`hYb`fYhk U`ZØbZ`GY`_i bXYbŁ`"
i gk`"

9g`ØVYffUgWk h`b]Wk hž`XUgg`X]YgY` ; Yk c`b`Y]hYb`V]g]bg`
9fk UWk gYbYbU`hYf`6YghUbX`\UhYb`"5`g`YhnhYg`J\`f]b`XYa`
_Y]bYb`ZfUnØg]gWk Yb`8cfZž]b`XYa`k]f`k c`b`hYbž`XYf`K]bhYf`
\YfY]bVfUWk ž`k Uf`]Wk`Yb hgYhnhž`U`g]Wk`YfZ` \fž`XUgg`k]f`X]Y`

<Y]ni b['ØVYf`B UW`h`Ub`UggYb`k ØfXYb"´ ÆW`Yfk UfhYhY`Y]bY
XfY]ghY``[Y` ; UgfYW`bi b["´fNi a` ; `ØW`k Uf`Ua`´9bXY`U`Yg`[i h` Ł

9g]gh`X]YgY`Ub[YVcfYbY` ; YbØ[gUa`_Y]hž`X]Y`a`]W`XUj`cb`UV`À`hž
j`Y` ; Y`X`Ui`gni`[YVYbž`gY`Vgh`k`Ybb`]W`]b`Y]b`DfcXi`_hj`Yf`]YVh
V]b"´A`UbW`a`U`_ca`a`h`YXcW`Yhk`Ugž`XUg`a`Y]bY
9bhgW`cggYb`Y]h`k`]f`_]W`Ui`Z`X]Y`DfcVY`ghY`h"´<]Yf`g]bX`ZØbZ
`i`i`i`f]ØgY`FY]gY[YgW`Yb`_Yž`X]Y`W`a`]f`gY`Vgh`k`ØbgW`Y"

%"´Hfc`Ymij`cb` ; `cVY!Hfc`hhYf`

8YhU]`g.` ; cf]b[`9`ZYbVY]bZUfVYbYf`&%!Nc`!Hfc`YmDfY]g.`%"`-`-`)`´´`#
%"(`\$\$`v`

- `U`h1` 2

8]YgYg`UhYa` VYfUi` VYbXY`9I`Ya` d`Uf`Vf]h]gW`Yf`<`UbXk`Yf`_g`_i` bgh
ghY`h`i[`Ubnc`VYb`Ui`Z`a`Y]bYf`K`i`bgW`]ghY"´A`]h`Y]bYf` ; YgW`]W`hYž
X]Y`V]g]bg`_J`f`%`,`-`+`ni`fØW`fY]W`hž`]gh` ; `cVY!Hfc`hhYf`Y`hY
VYfØ`a`h`ZØf`gY]bY`]b`gY]bYf` : UVf]_]b`<`YfhZc`fXg`]fY
`UbX[`YZYfh][`hYb`@`i`i`g`_c`ZYf"

8]Y`@XYFYW`_Yb`XYg`&%!Nc`!Hfc`Ymg`k`YfXYb`ZØbZ`HU[`Y`Ub[`Ui`Z
j`_]_hcf]Ub]gW`Yb`DfYgga`UgW`]bYb`[`YZcfa`hž`i`bX`X]Y` ; f]ZY`k`YfXYb
j`c`gh`À`bX][`j`cb`<`UbX`[`YZYfh][`h"

A`]h`j`]YfghY``[`Yb`DfY]gYb`g]bX`g]Y`ZØf`B`cfa`U`ghYfV`]W`Y`Y]bXYi`h][
i`bYffY]W`VUfž`_ØbbYb`g]W`UVYf`Y]bYf`VYY]bXfi`W`_YbXYb
?`i`bXYb`]ghY`fØ`a`Yb"´7`Ud`hU]b`GW`c`h`i`fY]ghY`%-`%&`a`]h` ; `cVY!Hfc`hhYf`
Ui`Z`XYf`VYfØW`h][`hYb`5`bhUf`_h]g!`9I`dYX]h]cb"

G]f`K`]bg`hc`b`7`i`fW`]VYbi`hnhY`Y]bYb` ; `cVY!Hfc`hhYf`8]gd`UhW`
7`UgYž`U`g`Yf`GW`Uhm`_Ub`n`Yf`k`Uf"´?`Øb][`]b`9`]nUVYh`k`À`hY` ; `cVY!

Hfc hYf %- (+ ZØf]\f : \]hYfk cWYb [YdÄW_ fl bX VYbi hnh]\fY
? cZYf bcW \Yi hYŁi bX G]f 9Xa i bX <]`Ufmigh]Y ['k Ä\ fYbX'gY]bYf
9j YfYgh!9fcVYfi b ['%-)' 'a]h; `cVY!Hfc hYf'ni a 'YfghYb'6Ug]g`U [Yf
Ui Z'

K Ybb]W 'Ya U'g]a '@chc [Yk]bbYžVY_ca a Y]W 'Y]bYb]b 'YXYf
: UfVY"

[`cVY!hfc hYf"WŁa

&" '@Y]WU'A !? Ua YfU

8 YhU]`g. '@Y]WU'A '¼`U`WUfhY`DfY]g. '5V`*"" , \$` `# ("- \$ \$`v

`U`h1 `i | i g`fY]gY [YgWYb_Y. ``Y]WU'a ` _Ua YfU 2

8]Y `UbX [YZYfh] [hY '@Y]WU'A []`hU`g`X]Y`_ca dU_hYghY
dfcZYgg]cbY`Y`?Ua YfU`XYf`K Y`hi bX`]gh'a]h`Y]bYf`H]YZY`j`cb
k Yb] [Yf`U`g` (&'a a `i bX`Y]bYa `Yl hfYa ``Y]gYb`J YfgW`i`gg
_cbghfi]Yfhž`dYfZY`_h`ZØf`F`Y]gY`Zchc [fUZYb`i bX` : chc`Łi fbU`]ghYb"

8 Ug`UbdUggVUFY`™!`U!WUfhY!5b [YVch]gh`gck c`X] []hU`U`g`Ui W
UbU`c [`j YfZØ [VUF`i bX`_ca a h]b`Y]bYf`F`Y]\Y`j`cb` : UfVYb`i bX
A UhYf]U`]Yb`a]hi bhYfgW]YX`]WYb` : i b_h]cbYb`fh"6"a]h`cXYf
c`bY`J]XYcŁ"G]Y`_ÖbbYb`k Ä`Ybž`cV`G]Y`XUg`@Y]WU!@ [c`Ui ZXYa
C VYfXYW`_fU`V]hYŁ`gck]Y`Y]bY`dYfgÖb`]WY` ; fUj`i`f`VY`U`hYb
a ÖW`hYb`cXYf`b]W`h"

B UhØf`]W` []Vh`Yg`gW`k YfYfY`?Ua YfUg`ZØf`DfcZ]gž`UVYf`ZØf`X]Y
a Y]ghYb`<cVVmZchc [fUZYb`]gh`X]Yg`dYfZY`_h [YY] [bYh"5i » YfXYa
VY`_ca a Yb`G]Y`ZØf`Ä`fY`ZØbZF]YgYb`bcW`Yhk Ug`K YW`gY` [Y`X"

`Y]WU!WUa YfU"WŁa

' "'HfU [VUfYf`Dfc`Y`_hcf`j`cb`D`\`]dg

8 YhU]`g. `D\`]dg`D]WŁD]l `DDL`" (% (`HUgWYbdfc`Y`_hcf`DfY]g. ``" - - `#
v`&, \$

U`h1 @ | i g!F Y]gY[YgWXYb_Y. hfU[VUfYf`D]WŁd]! Dfc Y_hcf 2

⇒ GØXdUn]Z_` \UhhYb`k]f`ZUgh]a a Yf`Y]bY`UhYa VYfUi VYbXY
5i gg]WŁh"GY`Vgh`X]Y`Àfa ghYb`HY]`Y`X]YgYf`k]bn][Yb`b`gY`b`V`]W_hYb
Ui ZUhYa VYfUi VYbXYg`K UggYf`i bX`ghfU\`YbX`V`Ui Yb`<]a a Y`"

8]Y`8]b[Y`ÀbXYfhYb`g]WŁ`YXcWŁ`gWŁbY`ž`U`g`k]f`]b`GØXUa Yf`_U
Ub_Ua Yb`"9]b`6i X[Yh`<cghY`]b`Y]bYf`k]bn][Yb`GhUXh`ÒZbYh`g]WŁ
bcfa U`Yfk Y]gY`ni`Y]bYf`\Yfi bhYf[Y_ca a YbYb`GhfU» Yž`Y]bYf
6UW_ghY]ba Ui Yf`cXYfž]a` : U`j cb`l mi b]žni`_]`ca YhYf`Ub[Yb
² X`UbX`"5b`X]YgYb`5VYbXYb`k ØbgWŁhYb`k]f`i bgž`k]f`\`ÀhhYb`Y]bYb
hfU[VUfYb`Dfc Y_hcf`k]Y`X]YgYb`k]bn][Yb`D]WŁD]l "

A]h`Y]bYa` ; Yk]WŁhj cb`bi f`&+\$`[` _Ubb`XYf`D]WŁD]l` 6]XYf`a]h
Y]bYf`; fÒ» Y`j cb`V]g`ni`" \$) `WŁ` f%&\$`Nc``Ł`UbnY][Ybž`À`b`]WŁ`k]Y
Y]b`hfU[VUfYg`?]bc`"9gj YfZØ[h`ØVYf`Y]bY`J]Y`nU\`j cb
5bgWŁ`ØggYb`fl G6ž`<8A` ž`J; 5ž`7ca dcbYbhž`7ca dcg]hYž
G8 #G8<7Ł`gck]Y`Y]bYb`" ž) !a a !5i X]cUi g[Ub[ž`XYf`g]WŁ`dYfZY`h
ZØf`X]Y`?cdd`i b[`a]h`Y]bYa` i bgYfYf`@YV`]b[g[Yf`ÀhYž`XYa
hfU[VUfYb`š@7\Uf[Y!@Ui hgdFYWŁYfž`Y][bYh"

8]Y`5__i`Ui ZnY]h`fhk Y]`Ghi bXYbŁ`]gh`b]WŁh`gc`Ub[`k]Y`]XYU`ž`UVYf
Ub[Yg]WŁhg`XYf`[Yf]b[Yb`; fÒ» Y`Y]b`U`nYdhUV`Yf`?ca d fca]gg"

5`g`Y]bYg`XYf`YfgWŁk]b[`]WŁYfYb`; YgWXYb_Y`Ui Z`XYf`@]ghY`]gh`X]Yg
j]Y`Y]WŁh`XUg`Yb][Yž`XUg`]WŁ`a]f`gY`Vgh`gWXYb_Y"

d\]`]dg"WŁ"i`_`

("`H]ZZUbm? ca dUgg

U`h1 @ | i g!F Y]gY[YgWXYb_Y. H]ZZUbm?ca dUgg 2

8YhU]`g. H]ZZUbm%, ' +`7ca dUggDfY]g. ``', \$#v&*)

⇒WŁ`k`ÀfY`j]Y`Y]WŁh`Y`Yf`[YbY][hž`DYhYfg`F Uh`ni`VYZc`[Ybž`k]Y`a Ub
Y]bYb`?ca dUgg`i bX`Y]bY`?UfhY`VYbi hnhž`k Ybb`a Y]b`?ca dUgg`gc
Ui gg`À`Y"

8]YgYg'k i bXYfgW ÒbY`GWa i W_ghØW_]gh]b`GhYf`b[g]`VYf
Y]b[YZUgghi bX`a]h`XYa `; fØbXi b[g`U\`f`j cb`H]ZZUbm`f%, ' +Ł
[fUj]Yfhi bX`_Ubb`Ui W`a]h`Y]bYf`dYfgØb`]W`Yb`B UW`f]W`h`[fUj]Yfh
k YfXYb"

9g`]gh]a `BYk `Mcf`_Yf`:`U[g\`d`GhcfY`i bX`]b`Ui g[Yk À\`hYb`H]ZZUbm
GhcfYg`Ui Z`XYf`[Ubnyb`K Y`h`Yf\`À`h]W`"

h]ZZUbm`W`a

) "`Gk Ufcj g_]!: Yfb[`Ug

8YhU]`g.`Gk Ufcj g_]`C dh]_`7@`7ca`dUb]cb``Y]W`hYg`:`Yfb[`Ug`DfY]g.`~
%`&`\$`#v`,`) \$

`U`h1 @ | i g!FY]gY[YgW`Yb`_Y.`Gk Ufcj g_]!: Yfb[`ÀgYf` 2

C V`Ui Z`GUZUf`]b`?Yb]U`cXYf`VY]a `6YcVUW`hYb`j cb`K]`Xh]YfYb`Ui Z
XYb`; U`½dU[cg!`þgY`bž`X]YgYg`:`Yfb[`Ug`V]YhYh`X]Y`dYfZY`_hY
6U`UbW`nk]gW`Yb`; Yk]W`hi bX`@Y]ghi b["

8 Ug`,`³`' \$!:`Yfb[`Ug]j YfZØ[h`ØVYf`Y]b`G]W`hZY`X`j cb`%&(`a`fl`+&
: i »Łi bX`Y]bY`,`!ZUW`Y`J`Yf[fØ»Yfi b[`ZØf`Y]bY`fY]Vi b[g`cgY
6YhfUW`hi b["`8UfØVYf`\]bUi g`g]bX`g]Y`%`%-`a`a`f(ž+`Nc``Ł``Ub[
i bX`k]Y[Yb`bi`f`) \$\$`[ž`bY`a`Yb`U`gc`Ui W`]b`À`fYa``; `cVY!HfchYf
b]W`hini`j]Y`D`Uhm`Y]b"

A]h`D`ÀbYbž`gd`ÀhYf`]b`X]YgYa``½\`f`bUW``5Zf]_U`ni`fY]gYbž`k YfXY
]W`a]W`bcW`Ub[Y`XUbUW`gY`bYb"

k k k "gk Ufcj g_]cdh]_`W`a

* "`5gdfYm!6UW_] [Ua`a`cb!6fYhh

8YhU]`g.`5gdfYm!6UW_] [Ua`a`cb`Ga`U`DfY]g.`5V`*`"`,`\$`~`#`&`" \$ \$`v

`U`h1 @ | i g!FY]gY[YgW`Yb`_Y.`5gdfYm!6UW_] [Ua`a`cb!GYh` 2

⊕ VYgh]a a hYb ? fY]gYb \Y]» hYgžk Ybb Y]b : fYi bX Y]bY MUW h
Yfk]fVhžgc ``hY a Ub]\a Y]b 6UW [Ua a cb!GYhigWXYb_Yb ž \Y]» h
Yg Ui ZXYf 5gdFYm K YVg]hY " K Ug []Vh Yg GW ÒbYfYgž Ui g
Yb []gW Ya GUhY ``YXYf a]h DU ``UX]i a gW ÒggYfbž
i bXi fW g]W h] [Yb DfÀn]g]cbgk ØfZY `bž K ØfZY VYW Yfb i bX
J YfXcdd i b [gk ØfZY `b3

Bi bž]b XYf HUH " W \ UVY a]W]a a Yf [YZfU [hžk Ug]W a Y]bYb
: fYi bXYb _Ui ZYb gc ``ž X]Y MUW hYb Yfk YfVYb " >hnhk Y] »]W "

Ugd fYm Wca

@Y]hV]`X. 8fYUa gh]a Y

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

8YhU]`g