

8 Yf`i b hYf[Ub[`XYf`; YfYWX h][_Y]h. `9]b
6`]W_`Ui Z': fUb_fY]WX g`> gh]ngmghYa

9]b`5fh]_Y`ØVYf': fUbÄc]g`A]hhYffUbXg`i a ghf]hhYbY
J Yf[Ub[Yb\Y]h`U`g'; UfXY`XYg`GWU i l`i bX`X]Y`\Yi h][Yb
<YfUi gZcfXYfi b[Yb`XYf`ZfUbnÖg]gWX Yb`> gh]n"

⊕ XYb `YhnhYb ⋈\fnY\bhYb \Uh g]WX X]Y K U\fbY\ a i b[XYf > gh]n
]b : fUb_fY]WX ghUf_ j YfÄbXYfh" : fØ\Yf [U`h X]Y > gh]n U`g Y]bY
fYgdY_h]YfhY i bX k c\` [YcfXbYhY ⊕gh]hi h]cb" 8cWX gY]h XYb
%- +\$Yf ⋈\fYbž]bgVYgcbXYfY bUWX XYa 5a hgUbf]hhj cb : fUbÄc]g
A]hhYffUbXž k]fX g]Y ni bY\ a YbX U`g]bYZZ]n]Ybh i bX j YfgU[Yb
k U\f[Ybca a Yb" 8Yf B]YXYf[Ub[XYf > gh]n k]fX cZh a]h XYf
<UfUb[i Y XYg F]WX hYfg Cgk U`X 6Ui Xch j YfVi bXYbž X]Y j cf
a Y\ f U`g (\$ ⋈\fYb XYb 5bZUb[j ca 9bXY Y]bYf [YfYWX hYb i bX
j Yf`Ägg`]WX Yb`F YWX hgdFYWX i b[`Y]b`Äi hYhY"

8]Y j YfX]Ybghj c`Y ⊕gh]hi h]cbž X]Y Y]bgh XUg FØW_[fUh XYf
ZfUbnÖg]gWX Yb ; YgY`gWX UZh V]`XYhYž gWX Y]bh]a a Yf a Y\ f k]Y Y]b
[YghfUbXYhYf 8Ua dZYf" J YfgWX]YXYbY : U_hc fYbž XUfi bhYf
dc`h]gWX Y 9bhgWX Y]Xi b[Yb i bX [YgY`gWX UZh]WX Y 9bhk]W_`i b[Ybž
\UVYb ni X]YgYf G]hi Uh]cb VY][YhfU[Yb" 8]Y 8]g_i gg]cb ØVYf X]Y
HcXYggghfUZYž X]Y A]hhYffUbX]b gY]bYb ZfØ\YfYb ⋈\fYb U`g A]b]ghYf
ZØf ; YfYWX h][_Y]h c\ bY NÖ[Yfb VYZØfk cfhYhYž ghY\h
ghY`j YfhfYhYbX ZØf XYb K]XYfgdfi WX nk]gWX Yb ZfØ\YfYb
, VYfnYi [i b[Yb i bX XYf U_hi Y`Yb FYU`]hÄh" A]hhYffUbX `]Y»
nk]gWX Yb %-) * i bX %-) + k Ä\ fYbX gY]bYf 5a hgnY]h U`g ; UfXY XYg
GWU i l` Yl U_h &&& HYffc]ghYb XYg : @B \]bf]WX hYbž Y]b l a ghUbXž
XYb j]Y`Y U`g i bj YfY]bVUf a]h gY]bYf gdÄhYfYb <U`hi b[ni f
5VgWX UZZi b[`XYf`HcXYggghfUZY`UbgY\Yb"

8]Y `U_hi Y`Y `F YU`]hÄh`XYf`> gh]n

⇒ XYf [Y[Ybk Åfh][Yb 8YVUhhY ØVYf X]Y ZfUbnØg]gWXY ð gh]n
ghY\Yb b]W\h bi f U`hY 9bhgWXY]Xi b[Yb]a : c_i gž gcbXYfb Ui W
X]Y]a a Yf k Y]hYf Ubk UWgYbXY @]ghY j cb JYfVfYWYb i bX
5[[fYgg]cbYb" GWcW_YfYbXY GhUh]gh]_Yb VYgU[Ybž XUgg]b
: fUb_fY]W hÀ[`]W fi bX %&\$ 5b[f]ZY a]h Y]bYf ?`]b[Y j YfØVh
k YfXYb" 9]b U`Ufa]YfYbXYf HfYbXžXYf k Y]hfY]WYbXY : fU[Yb ØVYf
X]Y G]WYf\Y]h i bX 9ZZ]n]Ybn XYg FYW\hgmgYhYa g Ui Zk]fZ" 8]YgY
NU\` j YfXYi h]W\h X]Y <YfUi gZcfXYfi b[Ybž j cf XYbYb X]Y ð gh]n
i bX`X]Y`GhfU] YfZc`[i b[gVY\ØfXYb`ghY\Yb"

<]bni _ca a hž XUgg XUg JYfhfUi Yb j]Y`Yf 6Øf[Yf]b X]Y ð gh]n
YfgWØhhYfh]gh" 8]Y K U\fbY\ a i b[j cb @U\ \Y]h i bX I bZ\][_Y]hž
X]Y [YZ\`f]W\ghYb JYfVfYWYf ni VYghfUZYbž gWØfh X]Y
I bni Zf]YXYb\Y]h" ⇒ a Yf k]YXYf []VhYg 6Yf]W\hY ØVYf U[[fYgg]j Y
?f]a]bU`]hÀhž i bX Yg k]fX VYZØfW\hYhž XUgg X]Y ð gh]n b]W\h]b XYf
@U[Y]ghž CdZYf Ui gfY]WYbX ni gWØhnYb" 8Yf : U` j cb MUb]W_
5`Åbcž XYggYb Gc\ b j cb Y]bYa VYhfi b_YbYb : U\fyf [YhØhYh
k i fXYž]`i ghf]Yfh X]YgY DfcV`Ya Uh]_ Y]bXfi W_gj c``" GY]b
`Y]XYbgWUZi]W\Yg D`ÀXcmYf ZØf ghf]_hYfY ; YgYhnY ni f 5\ bXi b[
j cb JYf_Y\ fghØhi b[Yb gd]Y[Y`h X]Y YfbghYb 5b`Y[Yb k]XYfž X]Y
j]Y`Y`6Øf[Yf`d`U[Yb"

8 Ug JYfhfUi Yb]b X]Y ð gh]n k]fX ni gÀm`]W Xi fW A Y`Xi b[Yb ØVYf
: fY]gd fØWY i bX i b[YfYW\hZYfh][hY : fY]`Uggi b[Yb YfgWØhhYfh" 9]b
6Y]gd]Y`]gh Y]b CVXUW\`cgYfž XYf k Y[Yb Ubh]gYa]h]gWYf
, VYf[f]ZY j cf ; Yf]W\h ghUbX i bX XYggYb : fY]`Uggi b[[fc»Y
6Ygcf[b]g Ui g`ØghY" Gc`WXY : Å`Y hfU[Yb ni f , VYfnYi [i b[VY]ž
XUgg X]Y ð gh]n j YfgU[h` b]W\h ni `Ynh]b XYb 5i [Yb XYf DfYggY
i bX XYf ² ZYbh`]W_Y]hž X]Y g]W\ bUW G]WYf\Y]h i bX Y]bYf _`UfYb
FYW\hg`U[Y`gY\ bYb"

8 Yf` ; fUh`nk]gWYb ; YfYW\h][_Y]h`i bX J YfgU[Yb

8]Y U_hi Y`Yb 9bhk]W`i b[Yb ZcfXYfb X]Y : fU[Y bUW XYf
: i b_h]cbU`]hÀh XYg ð gh]ngmgYhYa g]b : fUb_fY]W \YfUi g" 9g []Vh
Y]bYb _`UfYb 6fi W nk]gWYb XYf J c fghY`i b[Y]bYf ghUf_Yb i bX

gWØhnYbXYb ð gh]n i bX XYf FYU]hÅh XYf `YhnhYb ð\fnY\bhY" 8]Y ; fØbXY g]bX j]Y`ZÅ`h[/ j cb [YgY`gWUZh]WXYb JYfÅbXYfi b[Yb ØVYf X]Y 9fn]Y\i b[XYf Øb[YfYb ; YbYfUh]cbYb V]g \]b ni Y]bYf cZh U`g ni bUWg]Wkh[k U\ f[Ybca a YbYb FYW hgdFYW i b[" 8Yf K UbXY` XYf K YfhY i bX Bcfa Yb gWY]bYb b]W h bi f X]Y HÅhYfž gcbXYfb`Ui W`XUg`DchYbn]U`XYf`ð gh]n`gY`Vgh`ni `VYY]bZi ggYb"

9g V`Y]VhUVni k UfhYbžk c\]b g]W X]YgYf [YghfUbXYhY DUEi YVch XYf ð gh]n VYk Y[Yb k]fX" 8Yf 5ddY` Ub X]Y JYfUbhk cfh]WXYbžX]Y Ghfi _hi fYb XYf ð gh]n ni fYZcfa]YfYb i bX XUg JYfhfUi Yb XYf 6Øf[Yf ni fØW_ni [Yk]bbYbž k]fX `Ui hYf i bX Xf]b[`]WXYf" 8]Y <YfUi gZcfXYfi b[Yb g]bX Ybcfa ž i bX XYf K Y[ni f K]YXYf\YfghY`i b[XYg 5bgY\Ybg XYf ð gh]n _ØbbhY `Ub[i bX ghY]b][`gY]b"

ðWēi Yg A Ufh]bYnžY]b `Ub[`Å\ f][Yf æi fbU`]ghž VYgWfY]Vh hfY ZYbX X]Y gYbh]a YbhU`Y HfUi Yf ØVYf XYb B]YXYf[Ub[XYf ð gh]n. BY a UddY`Yn d`i g `Ua U]g : fUbW " 9]bY dfcj c_UbhY : YghghY`i b[ž X]Y XYb Ni ghUbX XYf ZfUbnØg]gWXYb ð gh]n ni gUa a YbZUggh i bX Y]bY Xf]b[YbXY 5i Zc fXYfi b[]ghž g]W XYb <YfUi gZcfXYfi b[Yb ni ghY`Yb`i bX `bchk YbX][Y`JYfÅbXYfi b[Yb`Y]bni `Y]hYb"

8]Y `U_hi Y`Y`ð gh]n`U[Y`]b`: fUb_fY]W

ð XYb `YhnhYb`ð\ fYb`U`h`XUg`ZfUbnØg]gWY`ð gh]ngmghYa`X]Y 5i Za Yf_gUa _Y]h`XYf`² ZYbh]W`_Y]h`Ui Z`g]W`[Ync[Ybž]bgVYgcbXYfY`]a`<]bV`]W`Ui Z`gY]bY`FYU_h]cbYb`Ui Z ; Yk U`h_f]a]bU`hÅh`i bX`[YgY`gWUZh]WXY`<YfUi gZcfXYfi b[Yb" GhUh]gh]_Yb`nY][Ybž`XUgg`X]Y` ; Yk U`hj YfVfYWXYb`]b`: fUb_fY]W ž]bgVYgcbXYfY`bUW`XYb`HYffc`fUbgW`À[Yb`j`cb`&\$%&ž`ghUf_ ni [Ybca a Yb`UVYb`"@Ui h`XYa`ZfUbnØg]gWXYb`ðbYba]b]ghYf]i a [UV`Yg`]a`ð\ f`&\$&&`a`Y`f`U`g`%`%\$`HYffc`fUbgW`À[Y`cXYf !j Yfgi WYž`X]Y`ni`nU`\fY]WXYb`HcXYgZÅ`Yb`ZØ`fhYb`"8]Y G]WYfghY`i b[`j`cb` ; YfYW`h][_Y]h`i bX`G]WYf\Y]h`\Uh]g]W`U`g`Y]bY [fc»Y`<YfUi gZcfXYfi b[`Yfk]YgYbž`X]Y`X]Y`FYggci`fW`b`XYf`ð gh]n i bX`XYf`Dc`]nY]`Ybcfa`ghfUdUn]Yfh"

9]b`k`Y]hYfYf`5gdY`_h`]gh`X]Y` , VYf`Ughi b[`XYf` ; Yf]W`hYž`X]Y`c`Zh`ni

J YfnØ[Yfi b[Yb`VY]`XYf`6YUfVY]hi b[`j cb` : Å`Yb`ZØ\fh"8]Y
bUh]cbU`Y`đ gh]nVY\ØfXY`VYf]W\hYh`j cb`Y]bYa`5bgh]Y[`XYf
Ub\Åb[] [Yb`J YfZU\ fYb`i a`*ž`ı`gY]h`&\$&%`"8]YgY` , VYf`Ughi b[
VYY]bhfÅW\h][h`b]W\h`bi f`X]Y`9ZZ]n]Ybnž`gcbXYfb`Ui W\`XUg
J YfhfUi Yb`XYf`6Øf[Yf`]b`X]Y` : Å\][_Y]h`XYg`GmghYa`gž
Ub[Ya`YggYbY` ; YfYW\h][_Y]h`ni` [Yk`Å\`f`Y]ghYb`"

? f]h]_`i bX`F`YZcfa` Ub gÅhnY

8]Y`? f]h]_`Ua`ZfUbnØg]gW\Yb`đ gh]ngmghYa`]gh`b]W\h`bYi`i bX`k`]fX
ni bY\`a`YbX`U`i hYf`"J]Y`Y`đ f]ghYb`i bX`6Øf[Yf`ZcfXYfb
i a`ZUggYbXY`F`YZcfa`Ybž`i a`X]Y`9ZZ]n]Ybn`i bX` : U]fbYgg`XYg
GmghYa`g`ni`j`YfVYggYfb`"9]bY`\`Åi`Z[] [YÅi`»`YfhY`A`Y]bi b[`VYgU[hž
XUgg`F`]W\hYf`Y]ghi b[Yb`ni`i bVYfYW\YbVUf`g]bX`i bX`XUgg`XUg
GmghYa`]b`gY]bYf`U`_hi`Y`Yb` : cfa`b]W\h`]b`XYf`@U[Y`]ghž`Ui`ZX]Y
<YfUi`gZcfXYfi b[Yb`i bgYfYf`NY]h`Ub[Ya`YggYb`ni`fYU[]YfYb`"8Yf
ZfUbnØg]gW\Y`5bk`U`hi bX`Y\`Ya`U`][Y`A`]b]ghYf`XYf`đ gh]nž`¥f]W
8i`dcbX!A`cfYh]ž`\Uh`k`]YXYf\`c`h`VYhcbhž`XUgg`Y]bY`F`YZcfa
bchk`YbX][`gY]ž`i a`Y]b` ; `Y]W\ [Yk`]W\h`nk`]gW\Yb` ; YfYW\h][_Y]h`i bX
ØZYbh]W\Yf`G]W\Yf\`Y]h`ni`Z]bXYb`"

C Vk`c\`X]Y`F`Y[]Yfi b[`F`YZcfa`Yb`Ub[Yghc`»`Yb`\`Uhž`g]bX`j`]Y`Y`XYf
A`Y]bi b[ž`XUgg`X]YgY`b]W\h`k`Y]h[Ybi [] [Y\`Yb`"9]b`6Y]gd]Y`]gh`X]Y
8]g`_i`gg]cb`ØVYf`X]Y`9]b`ZØ\fi b[`ghfYb[YfYf` ; YgYhnY`[Y[Yb
 ; Yk`U`h`j`YfVfYW\Yb`i bX`X]Y`J`YfVYggYfi b[`XYg`C`dZYfgW\i`hnYg`"Gc
[UV`Yg`]a`đ\`f`&\$&`"J`c`fgW\`Å[Y`ni`f`J`YfVYggYfi b[`XYf
I`bhYfghØhni b[`ZØf` ; Yk`U`h`cdZYf`i bX`ni`f`GW\UZZi b[`gdYn]U`]g]YfhYf
 ; Yf]W\hYž`X]Y`g]W\`Ui`ggW\`]Y`»`]W\`a`]h`XYb`6Y`Ub[Yb`j`cb`C`dZYfb
j`cb` ; Yk`U`h`i bX`gYI`i`Y`Y`Ya`A`]ggVfUi`W\`VYZUggYb`"

8]Y`<YfUi`gZcfXYfi b[Yb`i bX`DfcV`Ya`Y`XYg`GmghYa`g
j`YfXYi`h`]W\Ybž`XUgg`Yg`YfZcfXYf`]W\Y`A`U`»`bU\`a`Yb`ni`f
K`]YXYf\`YfghY`i b[`XYg`J`YfhfUi`Ybg`]b`X]Y`đ gh]n`VfUi`W\h`"8]Y
²`ZZYbh]W\`_Y]h`Yf\`c`ZZh`g]W\`j`cb`XYf`F`Y[]Yfi b[ž`XUgg`g]Y`]b`XYb
_ca`a`YbXYb`đ\`fYb`Yb`hgW\`c`ggYbY`GW\`f]hhY`i`bhYfb]a`a`hž`i`a`X]Y
đ gh]n`ni`f`YZcfa`]YfYb`i bX`[`Y]W\`nY]h][`X]Y`6Øf[YffYW\hY`ni
k`U\`fYb`"8]Y`_ca`a`YbXYb`K`U\`Yb`_ØbbhYb`Y]bYb`Yb`hgW\Y]XYbXYb
9]bZi`gg`Ui`Z`X]Y`F`]W\hi b[`XYf`đ gh]ndc`]h]_`]b` : fUb`_fY]W\`UVYb`"

8YhU]g

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