

G7 'C VYf\i a a Y''Ui Z'Dc_U`!>U[X.'K]fX'X]Y bÅW ghY 'GYbgUh]c b 'K]f_`]WÅ_Y]h3

⇒ a 'Hchc!Dc_U`!J]YfhY`Z]bU`Y`hf]Zh'XYf'G7 'C VYf\i a a Y''Ua
%- "\$, "&\$&('i a '%, .' \$'i \f'Ui Z'GJ 5'DU`n]b["' , VYffUgWÅi b[
a Ò[`]WÅ °

⇒ a `_]bYb'C VYf\i a a Y''\YffgWÅh[fc»Y'5i ZfY[i b[ž'XYbb'XYf'G7
C VYf\i a a Y''ghY`h]j cf'Y]bYa 'YbhgWÅY]XYbXYb'Gd]Y''ja 'Hchc!
Dc_U`"5a '8]YbghU['i a '%, "' \$'i \f'hf]Zh'X]Y'A UbbgWÅUZh'Ui Z'XYb
GJ 5'DU`n]b[ž'XYf']b'XYf'?fY]g`][UhUVY`Y`Ub[Yg]YXY'h]ghž'i bX'Y]b
G]Y[`_ÒbbhY`ZØf'Y]bY`bYi Y'GYbgUh]cb'ja 'Dc_U`gcf[Yb"
5VhY]i b[g`Y]hYf'7\f]ghcd\FY\ a Ubb'Åi »Yfh'g]WÅ'cdh]a]gh]gWÅ.
K]f'k YfXYb'U`Yg'jb'X]Y'K UU[gWÅU`Y'k YfZYb"

8]YgYg'5i ZY]bUbXYfhfYZZYb'a Uf_]Yfh'X]Y`YfghY`HY]`bU\ a Y'XYg'G7
C VYf\i a a Y''Ua 'Hchc!Dc_U`ž'i bX'X]Y`V]g\Yf][Yb'9f[YVb]ggY
gh]a a Yb'X]Y`Gd]Y`Yf'i bX': Ub'g'dcg]hj] " ð'XYf'YfghYb'Fi bXY
gWÅ]W_hY`C VYf\i a a Y''X]Y`VYbUWÅVUfhY`A UbbgWÅUZh'Ui g
@Ub[YbVUWÅ'a]h'&.%'bUWÅ'<Ui gY" ð'XYf'nk Y]hYb'Fi bXY`_cbbhY
g]WÅ'XYf'G7C`]b'Y]bYa 'gdUbbYbXYb'9'Za YhYfgWÅ]Y»Yb'[Y[Yb'X]Y
G; H'èghUbVi `A ccgVi f['Xi fWÅgYhYb'i bX'ni `Ymh'g]Y[hYb'g]Y'a]h
' .&]ja 'fY[i `ÅfYb'Gd]Y`ØVYf'XYb': 7`BYi ZU\fbž'Yk Y]g
A UbbgWÅUZhYb'Ui g`\Ò\YfYb'?`UggYb" K]f'k]ggYb'U`gcž'k]Y'a Ub
'?fY]g_`Ugg]ghYb'Ui g'XYa 'Dc_U`gWÅ a Y]»h ž'VYhcbh'FY\ a Ubb"

DU`n]b[`nY][h'GhÅf_Y`]a `K YhhVYk Yfv

⇒ a `J Yf[`Y]WÅ'XUni `U'X'Yf'GJ 5'DU`n]b[`V]g`Yhnh'ØVYfnYi [YbXY
@Y]ghi b[Yb'[YnY][h''8Yf'?fY]g`][]gh'hfUh]b'gY]bYb'V]g\Yf][Yb
Gd]Y`Yb'gY\`f'ghUf`_Ui Zi bX'gYhY'g]WÅ`_Uf'a]h'(. \$[Y[Yb'XYb
@][U`cb_i ffYbhYb'J Òhh]b['Xi fWÅ"5i WÅ'ja 'bÅW ghYb'Gd]Y''[Y[Yb

XYb`G7`HY[YfbVUW\`UhhYb`g]Y`XUg[`Y]WY`9f[YVb]g`i bX
dfcZ]h]YfhYb`]a`5W\hY`Z]bU`Y`j cb`Y]bYa` : fY]`cgž`XU`XYf`GJ
?fUbnVYf[`b]W\h`Ub[YhfYhYb`]gh"

Hfchn`XYf`nk Y`]@[U!| bhYfgW\]YXY`V`Y]Vh`XUg`GY`Vghj YfhfUi Yb`VY]
CVYf\i a a Y`i b[YVfcW\Yb"FY\ a Ubb`gdf]W\hj cb`XYf`A ch]j Uh]cb
XYf`Gd]Y`Yf.` BUW\XYa`Yg`V]g`Ub[`gc[i h[Y`Ui ZYb`]ghž`g]bX`X]Y
đ b[g`gW\cb`Y]b`V]gg`Ub[YZ]l h" `8]YgY`Ni j Yfg]W\h`gh`f`h`XUg
HYUa ž]bgVYgcbXYfY`]a`<]bV`]W`XUfUi Zž`XUgg`XYf
Dc`U`k YhhVYk YfV`ZØf`XYb`GJ`5`Y]bYb`UbXYfYb`GhY`Ybk Yfh`\UVYb
_ØbbhYž`XU`X]Y`@[U!GU]gcb`VYfY]hg`]b`j c`Ya` ; Ub[Y`]gh" K]f
hfUi Yb`i bg`YXYbZU`g`Y]bY`k Y]hYfY` , VYffUgW\i b[`ni ž`gc
FY\ a Ubb`k Y]hYf"

: Y\`YbXY`GW\`ØggY`gd]Y`Yf`i bX`bYi Y
< YfUi gZcfXYfi b[Yb

ŸXcW`a i gg`X]Y`CVYf\i a a `Yf`A UbbgW\UZh`Ui Z]\fYb
Gd]Y`YfhfU]bYf`5bhc b`<]fgW\ZY`X`j Yfn]W\hYbž`XYf`g]W\`]a`i f`Ui R
VYZ]bXYh" `8]YgYf`J Yf`i gh`k]Y[h`gW\k Yfž`XYbb`<]fgW\ZY`X`]gh`Y]b
YfZU\fYbYf`Gd]Y`Yfž`XYf`YbhgW\Y]XYbXY`HcfY`Yfn]Y`h"FY\ a Ubb
VYnY]W\byh`]b`U`g` U`hYb` : i W\gž`XYf`X]Y`8]b[Yf`j cfbY
fY]ba UW\h" `GhUhhXYggYb`ØVYfb]a a h`FYgYfj Y!7cUW` : `cf]Ub
6Ui a Ubb`X]Y`J YfUbhk c fhi b[`Ub`XYf`GY]hYb`]b]Yž`k Å\fybX`XUg
fYgh]W\Y`HYUa` j c`gh`bX][`]gh"

8 Ug`_ca a YbXY`Gd]Y`j Yfgdf]W\hj]Y`GdUbbi b[`i bX`9a ch]cbYbž
b]W\h`bi f`ZØf`X]Y`Gd]Y`Yfž`gcbXYfb`Ui W\`ZØf`X]Y` : Ubgž`X]Y`a]h
[fc»Yf`<cZ]bi b[`Ui Z`XUg`A UhW\`gW\Ui Yb" `8 Ug`[YgUa hY`HYUa`XYg
G7`CVYf\i a a Y`\Uh`g]W\`]a`@Ui ZY`XYg`K YhhVYk YfVg`ghUf`_
Ybhk]W`Y`hž`i bX`X]Y`Ni gW\Ui Yf`XØfZYb`Ui ZY]bY`dUW`YbXY
6Y[Y[bi b[`[YgdUbbh`gY]b"

9]b`6`]W`_Ui Z`X]Y`U`_hi Y`Y`Y`Dc`_U`g]hi Uh]cb

8 Yf`Hchc!Dc`U`]gh`ZØf`XYb`G7`CVYf\i a a Y`b]W\h`bi f`Y]bY
gdcfh]W\Y`<YfUi gZcfXYfi b[ž`gcbXYfb`Ui W\`Y]bY`[fc»Ufh][Y

; Y`Y[Yb\Y]hž'g]Wk`]b`XYf`F`Y[]cb`ni`d`f`Ä`g`Y`b`h]Y`f`Y`b`"8]Y`V]g`Y`f][Yb`
9fZc`[Y`\UVYb`VYfY]hg`ZØf`j`]Y`5i`Zg`Y`Y`b`[Y`g`c`f[hž`i`b`X`Y]b`k`Y]hY`f`Y`g`
K`Y]hY`f`_`ca`a`Y`b`k`Ø`f`X`Y`X]Y`A`U`b`b`g`W`U`Z`h`X`Y`Z]b]h]j`i`]b`XY`b`i`c`_`i`g`
fØ`W`Y`b`"8`Y`f`K`Y`h`h`V`Y`k`Y`f`V`k`]f`X`Y`b`h`g`W`Y]X`Y`b`X`ZØ`f`X]Y`9`b`h`k`]W`_`i`b`[
X`Y`g`H`Y`U`a`g`g`Y]b`ž`g`c`k`c`\`i`]b`6`Y`n`i`[`U`i`Z`X]Y`g`d`c`f`h]W`Y`b`i`Ä`\][`_`Y]h`Y`b`
U`g`U`i`W`k`U`i`Z`X`U`g`i`Y`a`Y]b`g`W`U`Z`h`g[Y`ZØ`\`i`]b`b`Y`f`\`U`V`X`Y`f`A`U`b`b`g`W`U`Z`h`

8]Y`U`i`Z`g`h`f`Y`V`Y`b`X`Y`A`U`b`b`g`W`U`Z`h`U`i`g`C`V`Y`f`\`i`a`a`Y`k`]f`X`g]W`Y`f`U`Y`g`
X`U`ZØ`f`h`i`b`ž`X]Y`b`Ä`W`g`h`Y`F`i`b`X`Y`n`i`Y`f`f`Y]W`Y`b`"9]b`G]Y`i`[`Y`[Y`b`X`Y`b`
G`J`5`D`U`n]b`[`U`b`b`h`Y`ZØ`f`j`]Y`Y`Y`V`Y`f`f`U`g`W`i`b`[Y`b`g`c`f[Y`b`i`b`X`X]Y`
9`b`Y`f`[]Y`X`Y`g`J`Y`f`Y]b`g`k`Y]h`Y`f`g`h`Y][`Y`f`b`"8`U`g`D`c`_`U`Z]Y`V`Y`f`i`b`
C`V`Y`f`\`i`a`a`Y`i`]g`h`X`Y`i`h`]W`k`g`d`Ø`f`V`U`f`ž`i`b`X`Y`X`Y`f`\`c`Z`h`U`i`Z`Y]b`
k`Y]h`Y`f`Y`g`?`U`d]h`Y`i`]b`X`Y`f`9`f`Zc`[`g`[Y`g`W`k]W`k`h`Y`X`Y`g`G`7`C`V`Y`f`\`i`a`a`Y`i`

Æ`X`Y`f`i`Y`g`W`k]W`k`h`Y`X`Y`g`D`c`_`U`k`Y`h`h`V`Y`k`Y`f`V`g`i`[`U`V`Y`g`n`U`\`f`Y]W`Y`
V`Y`f`f`U`g`W`i`b`[Y`b`ž`V`Y]X`Y`b`Y`b`i`b`h`Y`f`_`U`g`g][`Y`A`U`b`b`g`W`U`Z`h`Y`b`Ø`V`Y`f`
]\`f`Y`A`Ø`i`]W`k`_`Y]h`Y`b`\`i`]b`U`i`g`[Y`k`U`W`k`g`Y`b`g]b`X`"9]b`V`Y`_`U`b`b`h`Y`g`
6]Y]g`d]Y`i`]g`h`X`Y`f`8`6!`D`c`_`U`ž`k`c`i`]b`X`Y`f`G`U]g`c`b`&`\$`%`-`#`&`\$`X`Y`f`i`7`
G`W`k`U`_`Y`\$`(`]a`5`W`k`h`Y`Z]b`U`Y`Ø`V`Y`f`f`U`g`W`Y`b`X`[`Y`[Y`b`X`Y`b`
F`Y`[]c`b`U`i`][`]g`h`Y`b`G`J`K`U`X`\`c`Z`A`U`b`b`\`Y]a`U`i`g`g`W`k]Y`X`"Y`\`b`]W`Y`
G`n`Y`b`U`f]Y`b`ž`i`]b`X`Y`b`Y`b`5i`»`Y`b`g`Y]h`Y`f`H`Y`U`a`g`j`c`b`\`Ø`\`Y`f`_`U`g`g][`Y`b`
;`Y`[`b`Y`f`b`V`Y`g]Y`[Y`b`ž`g]b`X`i`]b`X`Y`b`Y`h`h`Y`b`i`X`\`f`Y`b`i`]a`a`Y`f`k`]Y`X`Y`f`
j`c`f`[Y`_`ca`a`Y`b`"8]Y`g`Y`\`]g`h`c`f]g`W`Y`b`D`U`f`U`Y`Y`b`n`Y][`Y`b`ž`X`U`g`g`i`a`
:`i`»`V`U`i`ž`i`]b`g`V`Y`g`c`b`X`Y`f`Y`i`a`D`c`_`U`V`Y`h`f]Y`V`ž`c`Z`h`X]Y`H`U[Y`g`Z`c`f`a`
Y`b`h`g`W`k]Y`X`Y`b`X`g`Y]b`_`U`b`b`i`b`X`X]Y`i`U`j`c`f]h`Y`b`f`c`Y`b`]W`k`h`i`]a`a`Y`f`
Y]b`[Y`\`U`h`Y`b`k`]f`X`"

9]b`U`b`X`Y`f`Y`f`d`f`Ä`[`b`U`b`h`Y`f`A`c`a`Y`b`h`i`]b`X`Y`f`D`c`_`U`[`Y`g`W`k]W`k`h`Y`i`]g`h`X`Y`f`%"`
:`7`B`Ø`f`b`V`Y`f`[`ž`X`Y`f`&`\$`\$,`(`]a`8`6!`D`c`_`U`Y`V`Y`b`Z`U`g`U`g`6i`b`X`Y`g`i`[`]g`h`i`b`
X`Y`f`Y`f`g`h`Y`b`F`i`b`X`Y`[`Y`[Y`b`X`Y`b`X`U`a`U`][`Y`b`J]Y`f`h`i`][`]g`h`Y`b`5`Y`a`U`b`b]U`
5`U`W`k`Y`b`j`Y`f`c`f`"8]Y`g`Y`D`U`f`h]Y`b`g]b`X`c`Z`h`j`c`b`\`c`\`Y`f`G`d`U`b`b`i`b`[
[`Y`d`f`Ä`[`h`i`b`X`n`Y][`Y`b`ž`X`U`g`g`i`a`i`»`V`U`i`U`Y`g`i`a`Ø`i`]W`k`i`]g`h`ž`k`Y`b`b`X]Y`
G`d]Y`Y`f`U`i`Z`X`Y`a`D`U`h`n`i`\`f`6`Y`g`h`Y`g`[`Y`V`Y`b`"J`Y`f`[`Y]W`k`V`U`f`Y`
5i`Z]b`U`b`X`Y`f`h`f`Y`Z`Y`b`Z]b`X`Y`b`g]W`k`U`i`W`k`i`]b`U`b`X`Y`f`Y`b`G`d`c`f`h`U`f`h`Y`b`ž`k`c`
X]Y`i`b`h`Y`f`Y`[Y`b`\`Y]h`U`i`Z`X`Y`a`D`U`d]Y`f`b`]W`k`h`i`]a`a`Y`f`X`Y`b`5i`g`[`U`b`[`X`Y`g`
G`d]Y`g`V`Y`g`h]a`a`h`"

5_hi`Y`Y`Y`G`h`U`h]g`h]_`Y`b`i`b`X`8`U`h`Y`b`

9]b'6`]W_Ui Z`U_hi Y`Y`8 UhYb`_Ubb`Y`ZYbž`XUg`J Yf`À`hb]g
nk]gWYb`XYb`A UbbgWUZhYb`VYggYf`ni`j YfghY`Yb`"@Ui`h8: 6!
GhUh]gh]_Yb`[Y`ÒfYb`X]Y`HYUa`g`XYf`?fY]g`_UggYž`k]Y`XYf`G7
CVYf`i`a`a`Y`ž`bcfa`U`Yfk`Y]gY`ni`XYb`i`bhYfYb`@[`Yb`]a`XYi`hgWYb
: i »VU`""8]Y`c`_U`Y`@[`U!`i`bX`Dc`_U`ghfi`_hi`f`]b`8Yi`hgW`UbX`nY][`hž
XUgg`A`UbbgWUZhYb`Ui`g`Y`Ò`YfYb`@[`Yb`]b`XYf`FY[`Y`U`g`: Uj`cf]hYb
[`Y`hYb`"8YbbcW`Y`UVYb`g]W`b]YXf][`YfY`A`UbbgWUZhYb`Xi`fW
9fZc`[`Y`]a`Hchc!Dc`_U`Y]bYb`B`Ua`Yb`[`Ya`UW`h`"8UhYb`Ui`g`XYa
8: 6`nY][`Ybž`XUgg`]b`XYf`Y`hnhYb`GU]gcb`bi`f`%)`i`XYf`HY`bY`a`Yf
Ub`XYb`Dc`_U`k`Y`hVYk`YfVYb`]f`YfghYg`Gd]Y`U`g`: Uj`cf]hYb
j`Yf`cfYbž`k`Ug`X]Y`A`Ò[`Y`W`_Y]h`ZØf`_`VYffUgW`i`b[`Yb`j`YfXYi`h]W`h`

Ni`g`À`h`]W`Z`UbX`Y]bY`i`a`ZfU[`Y`i`bhYf`:`Ubg`]a`Y`Y`f`&\$&`ghUhhž`]b
XYf`+&i`XYf`6Y`ZfU[`hYb`Ub[`UVYbž`XUgg`g]Y`Ub`Dc`_U`gd]Y`Yb`k`Y[`Yb
XYf`_`VYffUgW`i`b[`ga`ca`YbhY`i`bX`XYb`i`bYfk`UfhYhYb`9f[`YVb]ggY
]bhYfYgg]Yfh`g]bX`"8]Yg`i`bhYfghfY]W`h`X]Y`: Ugn]bUh]cb`XYg
Dc`_U`k`Y`hVYk`YfVYgž`X]Y`Ui`W`XUg`_ca`a`YbXY`Gd]Y`nk`]gWYb
XYa`G7`CVYf`i`a`a`Y`i`bX`XYa`GJ`5`DU`n]b[`df`À[`Yb`_`ÒbbhY`"

8YhU]`g

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