

=a a][fUh]cb
Gh Xn]b[



Gh Xn]b[! i b]j Yfg]hm

Dcfh [i YgY

; cg]Uf]UXY'a Y'a Uf]W`Uf`Ya `i a Ui b]j Yfg]XUXY"
Gh]b[`h.Uhmc`i `k Ubhlc`Ybfc`

7 nYW

F 1X#J'VnW`gY'nUdgJ#J'bUj ngc_Á`_c`Y"

; cg]Uf]UXY'a Y']bg]WY Yf`bc`Wfgc`XY
SSSSSSSSSSSS"

F 1X#J'VnW`gY'nUdgJ#J'bU`SSSSSSSSSSSSSS"

Gh]b[`h.Uhmc`i `k Ubhlc`Udd`mZcf`UV`ti fgY

[fUXi UÁ;c

VU_U½g_Ág]i X]i a

HndY`cZV`ti fgY

d] g [fUXi UÁ;c

dcg]fUXi ½bÉg]i X]i a

HndY`cZV`ti fgY

D\8

Xc_hcfg_Ág]i X]i a

HndY`cZV`ti fgY

hYa dc`]b]Y[fU

dfYnYbÉbÉg]i X]i a

HndY`cZV`ti fgY

a Y]c`dYfÉcXc

_ca V]bcj UbÁg]i X]i a

HndY`cZV`ti fgY

cb`]bY

cb`]bY

HndY`cZV`ti fgY

; cg]Uf]UXY`Ygh XUF`Ya `g Ui b]j Yfg]XUXY`dcf
SSSSSSSSSSSS"

F 1X#J'VnW`g]i Xcj U#J'bUj U Éj ngc_Á`_c`Ydc`XcVi
SSSSSSSSSSSS"

Gh]b[`ck`cb[`mci f`Yi VUUb[Y`dYf]cX`]g

i a `gYa YgfY

fYXybÉg]a Ygf

@Yb[h`cZg]umiUhzcfY][b`i b]j Yfg]hm

i a `Ubc`UMXÁ]Vt

W`U`U`UXYa]W`U`fc_

@Yb[h`cZg]umiUhzcfY][b`i b]j Yfg]hm

⇒ a a][fU]cb Gh Xn]b[



E i U]g'g;c'Ug'fYgf]AÑYg'XY'fUUV\c'dUfUYgh XUbHYg3 >U_½'gci 'dfUMtj bÉca YnYbÉdfc'ghi XYbmn3
5g_]b['Uvci hk cf_'fYgf]V]cbg'Zcf'ghi XYbng

8 Yj c'UdfYgybUf'Ug'Vd]Ug'Xcg'XcW'a Ybrcg'ci 'cg cf][]bU]g3 A i gfa 'd YX'c]h_cd]Y'Xc_i a Yoh 'bWc'hc'a i gÉVUh cf][]b½bÉXc_i a Ybmn3
5g_]b['Znci 'bYX'hc'dfcj]XY'h.Y'cf][]bU'XcW'a Ybrcg'cf'Vd]Yg

E i U]g'g;c'cg'fYei]g]hcg'XY'UMggc'¼i b]j Yfg]XUXY3 >U_Á'gci 'j ghi dbÉdc UXUj _m'dfc'ghi X]i a 3
I gYX'k \Yb'Udd'n]b['Zcf'i b]j Yfg]hm

J ci 'fWVYf'i a Udfcdcg]U'Zcfa U3 Dc 'YH'a]Zcfa ½bÉbUMÉX_i '_Y'ghi X]i 3
5g_]b['Znci 'k]'fWV]j Y'U'Zcfa U'cZZYf

5 i b]j Yfg]XUXY'Ua VÁa 'cZYfW'UWta cXUÁ;c3 NUfi éi 'Yj ngc_½_c'Ui Vntcj ½bÉdfc'ghi XYbmn3
5g_]b['Zh'Y'i b]j Yfg]hmdfcj]XYg'UWta a cXU]cb

C 'Wfgc'Ua VÁa]bW]i a 'dYfÉc'Xc'XY'Ygh½]c3 NUfbi 'Y'ghi X]'bÉcVcf]'dfUMtj bÉgh½3
5g_]b['Znci f'i b]j Yfg]hmVti fgY'bj c'j Yg'Ub]bYfbg\]d'dYf]cX

< ¼i a 'Wg'hc'dUfUYgh XUF'Vta c]bHYfVla V]ghU'bYghU A i gfa 'U_c'j Ua :bbU'ghi XYbhd'U]h]_c'bÁ3
i b]j Yfg]XUXY3
5g_]b['Znci '\j Y'hc'dUmhc'ghi XmiUg'Ub'Yi WUb[Y'ghi XYbhiUhiUhi b]j Yfg]hm

7 ca c'dcggc'UWta dUb\Uf'c'dfc[fYggc'XU'a]b\U >U_ 'a c\i 'gYXcj Uhd'f V÷\ 'a Á'd]\½_n3
]bgV]Á;c#Ubx]XUhi fU3
5g_]b['\ck 'nci 'Wb'g'Y'h'Y'dfc[fYggc'Znci f'Udd']W]cb

E i U]g'g;c'cg'fYei]g]hcg'XY'Éb[i UdfU'OEb[i U3 >U_Á'gci 'Urm_cj Ádc UXUj _n3
=bei]f]b['Uvci h'h'Y'Ub[i U[Y'fYei]fYa Ybhc'VY'Zi 'Z]'YX']b'cfXYf'hc'VY'UWVdh'X'UhiUhi b]j Yfg]hm

7 ca c'Á'c'g]ghYa UXY'SSSSSSSSSSS3 >U_Ú'Y'SSSSSSSSSSS'gnghÁa 3
5g_]b['bZcfa U]cb'Uvci h'h'Y'gnghYa

VÁX]hc _fYX]hm
HndY'cZ'gnghYa

bchUg rb¼a _cj ½bÉ
HndY'cZ'gnghYa

⇒ a a][fU]cb Gh Xm]b[

J ci 'fYVVYf'i a U'WfhjZ]WÄ;c'UWXAÄ]W]bc'Z]bU
Xc']bhYVWä V]c3

8cg]ubi 'gi X]bÉd Y\`YX'bU'_cbV]a Äj Òa :-bn3

5g_]b['J]nci '\Uj Y'Ub'UWXYa]WfUbgV]dhUhY'YbX'cZnci f'YI VWUb[Y

E i U'Ä'c'Ygh]c'XY'Ybg]bc3

>U_Äj nh'écj UWÄa YrcXm'gci 'dci Éj 'Ybn3

⇒bei]f]b['U'ci hi'hY'h'UW]b['gmY

G;c'SSSSSSSSSSSSS'3

>gci 'hUa 'SSSSSSSSSSSS'3

⇒bei]f]b['U'ci hi'hY'h'UW]b['gmY

U `Ug'YI dcg]h]j Uj

d YXb½_m

HndY'cZVWUgg

gYa]b½]cg

gYa]b½Y

HndY'cZVWUgg

hi hcf]U]g

_cbj `hUW

HndY'cZVWUgg

Vt'bzYfÄbV]Uj

_cbZfYbW

HndY'cZVWUgg

E i Y'Wfgcg;c'cZYfY]Xcg'dcf'YgWt' UjXY'j Yf;c3

>U_Ä'd YXa :-hmbUMÉÉ`YtbÉ`_c`U3

5g_]b['j]bZcfa U]cb'U'ci hi'hY'_]bXg'cZVt'i fgYg'cZYfYX'Vmjg a a Yf'gWcc`g

E i UbXc'UWt'bhWw'a 'Uj'dfcj Uj3

? X'm'gci 'h_ci`_n3

5g_]b['k '\Yb'h'Y'YI Ua g'UfY

C bXY'dcggc'YbVt'bh'fU'']bZcfa UÄNY'g'gcVfY'cg'W'fgcg
X]g]cbÉj Y]g3

? XY'a c\i 'bU'Éh]bZcfa UW'c'j YW'Xcgi dbÜW
d YXa :-hW3

5g_]b['k '\YfY'mci 'Wb'Z]bX'j]bZcfa U]cb'U'ci hi'hY'Vt'i fgYg

< ½a a 'Vt'a d'YI c'Ygdcf]h]j c'Uei]3

BWVt'ÉgY'bUj ngc_Ä'`_c'Ygdcf]h]j bÉWb]fi a 3

5g_]b['J]h'YfY'g'U'i b]j Yfg]hmgdcf]g'Wb'hYf

7 ca c'dcggc'a Y'UZ]]U'U']bgh]h]]ÄNY'g'Ygi XUb]h]g3

>U_g'Y'a c\i 'd]dc'q]h'_Y'gi XYbhg_Üa 'cf[Ub]nUWÄ 3

5g_]b['\ck' mci 'Wb'`c]b'g]hi XYbhgcV]Yf]Yg

⇒ a a] [f U h] c b G h X m] b [



E i U] g g c c g W g t c g X Y j] X U Y g h a U X c g Y a ' O V X U X Y C 3 > U _ A ^ g c i ' d] V] b A ^ j j c h b E b 1/2 ` U X n j ' O V] m C 3
- b e i] f] b [' U W c i h h Y Y g h a U h X ^ j]] b [' V e g h g] b ' h Y V] m

G h X m] b [! @ U b [i U [Y W e i f g Y g

D c f h i [i Y g Y

7 n Y W

E i U] g ^ E b [i U g j d c g g c Y g h X U F Y a ' g U Y g W e U 3 > U _ A ^ U m m a i ' g i X c j U h b U j U E _ c ^ Y 3
5 g _] b [' k \ U h ^ U b [i U] Y g j m e i ' W b ^ g h i X m i U h h U h i g W c c ^

9] g Y i a ' h Y g Y X Y b] j Y U a Y b h c d U F U j U] U F a Y i b E j Y 3

B U M E E Y f c n U n c j U M E h Y g z _ h Y U i f e E O f c j Y ' a A c U m U 3

5 g _] b ['] Z h Y f Y ' g U d ^ U W a Y b h i Y g h i c U g g Y g g m e i f ^ Y j Y

D c g g c a Y h f U b g Z Y f f d U F U c i h c b E j Y ' g Y c e i Y Y g r c i Z h Y b X c b j c Z c f U X Y e i U X c d U F U a] a 3

A c i U h i d Y U h Y b # U X c ^ j b A g _ i d] b n z ^ Y g h] Y h U z _ h Y f c i d f 1/2 ÷ b U j h j i ^ z b Y b E d f c a ÷ d E j \ c X b 1/3

5 g _] b ['] Z n e i ' W b W U b [Y ^ Y j Y ' b W b Y m e i ' U F Y b c h i g U h g Z Y X k] h ' h Y c b Y m e i ' U F Y U h Y b X] b [

J c W e j Y a i a U X Y g W A c X Y h U \ U X U X c W f g c 3

B U M E E Y X Y h U] b E d c d] g _ i f r i 3

5 g _] b ['] Z h Y f Y ' g U X Y h U] Y X X Y g W d h] c b c Z h Y W e i f g Y

E i U ^ A c b O a Y f c a 1/2] a c X Y U i b c g d c f W U g g Y 3

> U _ U ^ Y a U] a 1/2 b E d c e Y h i g i X Y b h j Y h E X ÷ 3

5 g _] b [' k \ U h h Y a U] a i a ' b i a V f c Z g h i X Y b h g] b U W U g g] g

E i U] g g c U g W e a c X] X U X Y g X U Y g W e U 3

> U _ A j n V U j Y b E a 1/2 j Y j U E _ c ^ Y 3

5 g _] b [' k \ U h Z U W] h Y g h Y f Y U F Y] b ' h Y g W c c ^

J c W e j h a V A a ' c f [U b] n U a ' Y i W f g Y g 3

D c 1/2 1/2 Y i _ i f n Y 3

5 g _] b ['] Z h Y g W c c ^ U f f U b [Y g U g c Y i W f g] c b g

E i U] g d f c [f U a U j j c W e j c Z Y f W a 3

> U _ A d f c [f U a m b U M E E j U Y ^ _ c ^ U 3

5 g _] b [' k \ U h d f c [f U a g U F Y c Z Y f Y X

G h X m] b [! G W c U f g \] d g

D c f h i [i Y g Y

7 n Y W

; c g U F] U X Y g W Y f e i U] g g c U g j d c f h i b] X U X Y g X Y Z] b U b W U a Y b h c "

F 1/2 # U V m W g Y] b Z c f a c j U # U c a c b c g Y W d c 1/2 U h i c g h d Y b X] i a "

- b e i] f] b [' U W c i h z b X] b [' c d d c f h i b] h Y g

⇒ a a][fUh]cb Gh Xn]b[



E i U]g'f[ſcg'dcXYa 'Z]bUbW]f'a Yi g'Ygh Xcg3
5g_]b['k \]W'VcX]Yg'Wb'Zi bX'mci f'gh X]Yg

>U_Å'cf[Ub]nUW'a c\ci 'Z]bUbW]f Uha c'Y'gh X]U3

DfY]g'c'XY'U I É]c'Z]bUbW]f'c'dUf'U'SSSSSSSSSSSSS"
Gh]b['h.Uh'mci 'bYX'Z]bUbW]f'Y'd

Dch Wi 'j'Z]bUbé'bÉdcXdcfi 'dfc'SSSSSSSSSSSSS"

a YbgU]XUXYg
H\]b['h.Uh'mci 'bYX'Z]bUbW]f'Y'd'Zcf

_c'bÅ

XYgdYg]g'XY'g Vg]gh'f'W]U
H\]b['h.Uh'mci 'bYX'Z]bUbW]f'Y'd'Zcf

]j'chÉb½'UXm

W]XUXcg]bZ]bh]g
H\]b['h.Uh'mci 'bYX'Z]bUbW]f'Y'd'Zcf

dÅ'eY'c'XÉh-

E i U]g'g'c'cg'h]dcg'XY'Vc'g]g'X]g]cb]f] Y]g3
5g_]b['k \]h_]bXg'cZg'W'c'Ufg\]dg'UfY'U] U]U'Y

>U_Å'Xfi \m]g]dYbX]U'gci '_X]g]dcn]M]B

Gh Xn]b[! J U]XU]b['ZcfY][b'XY[fYYg Dcfh [i YgY

7 nYW

9i '[cg]U]XY'j U]XU]f'a Yi 'X]d'ca UYa 'Q]U'É'Q
Gh]b['h.Uh'mci 'k ci 'X'_'Y'hc'j U]XU]Y'mci f'XY[fYY'Wf]h]Z]W]h]Y]b'h.Uh'Vdi b]fm

7\h' VnW#Vh'U'VnW'g]c] ÷]ha ^h]h `j 'Q]h]Y' nYa ÷Q

J c'W]g]Ya 'i a U'']g]U]XY'f'UXi h'fYg'Wf]h]Z]W]Xcg'Ya
OÉb[i U3
5g_]b['Z]h.YfY]g'U'']g]h'cZ'Wf]h]Z]YX'h'Ubg'U'c'fg]b'h.Y'Ub[i U]Y'h.Uh'mci 'bYX

A 'h]g]Ynb]a 'g'Wf]h]Z]c] Ub]a]'d Y_'UXU]Y]Z'_h]É
d Y_'XU]É] 'Q]h]Y' 'Uhm]U3

CbXY'dcgg'V'bgY[i]f'i a 'Wf]h]Z]W]Xc'XY
Yei]j U'f'W]U3
5g_]b['k \]YfY'mci 'Wb['Yh'U'Wf]h]Z]W]h]Y'cZ'Yei]j U'Yb'W'h

? XY'a c\i 'Xcg]h'Wf]h]Z]_h]c'f'c] bc'Wobcg]a Å'c'h]h 'i 3