

6YghYf'GcbbYbi bhYf[ Ub[ gdi b\_h'Ui Z  
< Ua ]`hcb'≡`UbX' 'CbY'HfYY'< ]`

K Ybb'G]Y'X]Y'K \]hgi bXUmg'VYgi WXYbž'ZfU[ Yb'G]Y'g]W  
j ]Y''Y]W hž'k Ug'XYf'VYghY'GcbbYbi bhYf[ Ub[ gdi b\_h'Ui Z  
< Ua ]`hcb'≡`UbX']gh3'8Yf'VYghY'GcbbYbi bhYf[ Ub[ gdi b\_h'Ui Z  
< Ua ]`hcb'≡`UbX']gh'Y]b'<Ø[ Y'ž'XYf'U'g'CbY'HfYY'< ]''VY\_Ubbh  
]gh''Gc'[ Y'Ub[ Yb'G]Y'ni a 'VYghYb'GcbbYbi bhYf[ Ub[ gdi b\_h  
Ui Z'< Ua ]`hcb'≡`UbX' 'CbY'HfYY'< ]''< Ua ]`hcb'≡`UbX']gh  
n]Ya `]W \_'Y]bž'XU\Yf']gh'Yg'dfU\_h]gW ž'ZUgh'YXYb'Di b\_h'XYf  
≡gY`ni ': i »'cXYf'a ]h'XYa ': c`Zvi [ [ mini 'YffY]WYb": Øf  
X]Y'Yb][ Ybž'X]Y ]b'XYf'BA\Y'XYf'< Ui dhghfU» Y'XYf'≡gY`  
ØVYfbUW hYbž']gh'Yg'bi f'Y]b'&\$!a ]bØh][ Yf'GdUn]Yf[ Ub[ ži a  
X]Y'Gd]hY'XYg'CbY'HfYY'< ]''ni 'YffY]WYbž'k c'g]W'XYf'VYghY  
GcbbYbi bhYf[ Ub[ gdi b\_h'Ui Z/ Ua d^Y''d/

K Ybb'G]Y'X]Y'K \]hgi bXUmg'VYgi WXYbž'ZfU[ Yb'G]Y'g]W j ]Y''Y]W hž  
k Ug'XYf'VYghY'GcbbYbi bhYf[ Ub[ gdi b\_h'Ui Z'< Ua ]`hcb'≡`UbX']gh3

8Yf'VYghY'GcbbYbi bhYf[ Ub[ gdi b\_h'Ui Z'< Ua ]`hcb'≡`UbX']gh'Y]b  
<Ø[ Y'ž'XYf'U'g'CbY'HfYY'< ]''VY\_Ubbh]gh"

Gc'[ Y'Ub[ Yb'G]Y'ni a 'VYghYb  
GcbbYbi bhYf[ Ub[ gdi b\_h'Ui Z'< Ua ]`hcb  
≡`UbX' 'CbY'HfYY'< ]`

< Ua ]`hcb'≡`UbX']gh'n]Ya `]W \_'Y]bž'XU\Yf']gh'Yg'dfU\_h]gW ž'ZUgh  
'YXYb'Di b\_h'XYf'≡gY`ni ': i »'cXYf'a ]h'XYa ': c`Zvi [ [ mini  
YffY]WYb"

: Øf'X]Y'Yb][ Ybž'X]Y ]b'XYf'BA\Y'XYf'< Ui dhghfU» Y'XYf'≡gY`  
ØVYfbUW hYbž']gh'Yg'bi f'Y]b'&\$!a ]bØh][ Yf'GdUn]Yf[ Ub[ ži a 'X]

Gd]hnY`XYg`C bY`HfYY`< ]``ni`YffY]WXYbž`k c`g]WXYf`VYghY  
GcbbYbi bhYf[ Ub[ gdi b\_h`Ui Z<Ua ]`hcb`≡`UbX`VYZ]bXYh"

≡W`UVY`XYb`GhUbXcfh`Ui ZXYf`? UfhY`i bhYb`a Uf\_]Yfhž`XUa ]h`G]Y  
XYb`Cfh`Y]WXYf`Z]bXYb`\_`ÖbbYb"

8Yf`K Y[ `bUW`cVYb`]gh`b]W`h[ YfUXY`Y]bY`K UbXYfi b[ ž`gcbXYfb  
Y\Yf`Y]b`J c fghUXhgdUn]Yf[ Ub[ "`HfchnXYa` ]gh`X]Y`5i gg]W`hj cb  
cVYb`XYZ]b]hj`Y]bYf`XYf`VYghYb`CfhYž`i a`Ybhk`YXYf`XYb  
GcbbYbi bhYf[ Ub[ `cXYf`XYb`GcbbYbUi Z[ Ub[ `ni`VYcVUW`hYb"

## C bY`HfYY`< ]``GcbbYbi bhYf[ Ub[ gdi b\_h

9]b`HfYY`< ]``!GcbbYbi bhYf[ Ub[ gdi b\_h]gh`hUhg`W`]W`bUW`XYf  
6Uf`VYbUbbhž`X]Y`g]W`Ui ZXYa`< Ø[ Y`VYZ]bXYh`G]Y`k YfXYb  
nk`Y]Z`c`g`Hci`f]ghYb`gY`Ybž`X]Y`cVYb`Y]bYb`K`Y]b`cXYf`Y]bYb  
7cW`hU]`a`]h`6`]W`Ui Z`X]Y`K` \]hgi`bXUm`≡`UbXg`[ Yb]Y»Yb"

5a`GcbbYbi bhYf[ Ub[ gdi b\_h\_`ÖbbYb`G]Y`XYb`GcbbYbi bhYf[ Ub[  
ØVYf`8UmXfYUa`≡`UbX`i`bX`XYa` : Ygh`UbX`Ui ZXYf`K`YghgY]hY  
VYcVUW`hYb"

G]Y`k YfXYb`Ui W`a`]h`6`]W`Ui ZXYb`GcbbYbi bhYf[ Ub[ `Ui ZXYf  
UbXYfY`b`G]Y]hY`VY[ fØ» hž`XYf`g]W`V]g`bUW`K` \]hgi`bXUm`≡`UbX  
YfghfYW`h"

≡a` ; Y[ YbgUhn`ni`gY]bYa`BUa`Yb`\Uh`XYf`GcbbYbi bhYf[ Ub[ gl  
5i gg]W`hgdi b\_h`C bY`HfYY`< ]``hUhg`W`]W`a`Y`fYfY`DU`a`Yb`i`bX  
UbXYfY`Y]b`Y]a`]gW`Y`6`Äi`a`Yž`X]Y`XYb`< Ø[ Y`di b\_h]YfYb`"9g  
YfnYi [ h`XYZ]b]hj`Y]bY`hfc d]gW`Y`5ha`cgd`\ÄfYž`k`Ybb`G]Y`XYb  
GcbbYbi bhYf[ Ub[ ` \]bhYf`]bYb`VYcVUW`hYb"

U`h1`VYghYf`gcbYbi bhYf[ Ub[ gdi b\_h`Ui Z`Ua ]`hcb`]g`UbX`2  
U`h1`Gi`bgYh`Dc]bh`Ui Z<Ua ]`hcb`≡`UbX`C bY`HfYY`< ]``  
5i gg]W`hgdi b\_h`2

6YghY`>U`fYgnY]h`ZØf`Y]bYb`6Ygi`W`Ui Z  
<Ua ]`hcb`≡`UbX

K Ug ]gh'X]Y`VYghY`F Y]gYnY]h'ZØf`< Ua ]`hcb`≡g`UbX3`8 Yf`VYghY`A cbUh  
ZØf`Y]bYb`6Ygi W` ]gh'XYf`GYdhYa` VYf``8 Ug` ]Y[ h`Ub` \ Ø\YfYb  
K UggYfhYa` dYfUhi` fYbž`k Ufa` Yb`HU[ Yb`i` bX`XYb`[ Yf]b[ ghYb  
B]YXYfgW`U[ ga` Yb[ Yb"

9g ]gh`YXcW`a` Ø[ `]Wž`< Ua ]`hcb`≡g`UbX`XUg`[ Ubny` ↘\f`ØVYf`ni  
VYgi` W`Yb``8 ]Y`< cW`gU]gcb`ZØf`GY[ Y`!`i` bX`?`fYi` nZU`fhYb`Ui` Z`XYb  
K` \]hgi` bXUm`≡g`UbXg`]gh`nk` ]gW`Yb`A` U]i` bX`GYdhYa` VYf"

K` Å`fYbX`XYf`Gca` a` Yf`XYZ]b]h]j` \Y]»` YfYg`K` YhYf`V]YhYhž`[ ]Vh`Yg  
a` Y`f`hfcd]gW`Yb`F Y[ Yb`i` bX`X]Y` ; YZU`f`j` cb`K` ]fVY`ghØfa` Yb`  
5i` »` YfXYa` ]gh'XYf`Gca` a` Yf`X]Y`< cW`gU]gcb`ZØf`[ YZ`Å`f`]W`Y  
A` YfYgghUW`Y` ]b`XYb` ; Yk` ÅggYfb`XYg`?`cfU`Yba` YfYg`  
U`h1` :` chcg`j` cb`K` \]hY`Uj` Yb`6YUW` 2

J`9F` ;` 9GG9B`G`⇒`B`⇒`<`H`9`B`9`F`9`G`9`B`5`7`<`K`<`#`9`<`5`J`9`B`6`9`5`7`<`.  
:`C`H`C`G`J`C`B`K`<`#`9`<`5`J`9`B`6`9`5`7`<`ž`8`⇒`6`9`K`9`G`9`B`ž`8`5`GG`9`G  
9`B`9`F`8`9`F`G`7`<`²`B`G`H`9`B`C`F`H`9`8`9`F`K`9`@`H`G`H

K` Ub`b` ]gh`Gc`b`b`Y`b`i` b`h`Y`f`[` Ub`[` `Ui` Z`<` Ua` ]`hcb`≡g`Ub`X`3`

≡`XYb`Gca` a` Yfa` cbUhYb`[ Yb]Y»` h`E`i` Y`Y`bg`UbX``Å`b`[ YfYž` \Y]»` YfY  
HU[ Y``9fk` UfhYb`G]Y`XU`Y`f`Y]bYb`hmd]gW`Yb`K` \]hgi` bXUm  
GcbbYbUi` Z[ Ub`[` [ Y[ Yb` )` .` \$`I` \f`i` bX`Y]bYb`GcbbYb`i` b`h`Y`f`[` Ub`[` i` a  
Yhk`U`%` .` ( )` `I` \f"

≡`XYb`VY` ]YV`h`Y`f`Y`b`ž`\_Ø` \`Y`f`Y`b`K` ]b`h`Y`fa` cbUhYb`[ Y` \`h`X]Y`GcbbY  
Yhk`Ug`gd`Å`h`Y`f`i` a` `Yhk`U`\*` .` ( )` `I` \f`Ui` Z`i` b`X`i` a` `Yhk`U`%`+` .` ( )` `I` \f  
i` b`h`Y`f"

:` Ø`f`X]Y`Yb][ Ybž`X]Y`XYb`GcbbYb`i` b`h`Y`f`[` Ub`[` `nY]h`]W`d`Ub`Yb  
a` Ø`W`h`Y`b`ž`\_Ø`b`b`Y`b`G]Y` \]Y`f`Y`X`Y`f`n`Y]h`X]Y`c`\_U`Y`b`GcbbYb`Ui` Z`i` b`X  
!`i` b`h`Y`f`[` Ub`[` gnY]h`Y`b`Y]bg`Y` \Yb"

U`h1` GcbbYb`i` b`h`Y`f`[` Ub`[` `Ui` Z`<` Ua` ]`hcb`≡g`Ub`X` 2

U`h1` Y]b`V`Ui` a` \Ø[ Y`V`Y`gh`Y`f`g`c`b`b`Y`b`i` b`h`Y`f`[` Ub`[` g`d`i` b`\_`h`Ui` Z  
\`Ua` ]`hcb`]g`Ub`X` 2

U`h1` VYghYf`Ui` gg]W`hg`d`i` b`\_`h`VY]g`c`b`b`Y`b`i` b`h`Y`f`[` Ub`[` `Ui` Z` \Ua` ]`hcb  
]g`Ub`X`c`b`Y`h`f`Y`Y` \]`k` Yg`Y`Y`\_`h`f`Uj` Y` 2

8YhU]g

6Ygi W\Yb`G]Y`i bg`Ui Z.`Y]bY!fY]gY"XY