



Universidade de Brasília - UnB
Faculdade UnB Gama - FGA
Engenharia de Software

Catálogo de Padrões Arquiteturais: Uma Visão Organizacional para Sistemas Multiagentes

Autor: Tainara Santos Reis
Orientador: Prof^ª. Dr^ª. Milene Serrano

Brasília, DF
2017



y-S-q r- ^zbs pCS

Catálogo de Padrões Arquiteturais: Uma Visão Organizacional para Sistemas Multiagentes

[b^bLq " - s~4\ C\$@ - b<-qsb @CLq @- éxb
C\ B^LC^P- q\$ @CrblH.: q@ } ^SfCq\$@ @C
@C 3q s Y><b\ b qI ~SSb e- qS Ye- q b4Q
zC^éxb @by z- Y @C3- <P- qYC\ B^LC^P- q\$
@CrblH.: qI

} ^SfCq\$@ @C @C 3q s Y Q} ^3
G <- Y@ @C} ^3 K- \ - QGK,

a qC^z- @bq=dqHi ? q i [SC^CrCqf ^b
; bbqC^z- @bq=dqHi ? q i [-~q<Sb rCqf ^b

3q s Y>? G

| Ceu

y-S-q r-^zbs pCS
; -z-YLb @Cd-@q Cs, q ~Sz-q S=} \ - , Sxb a qL ^S- <S^-Ye-q rSz\ -s
[~YS LC^zGswy-S-q r-^zbs pCSi 3qs Y>? G>|CEuQ
_v ei =Sf f- Y~\ -s <bYqgt {CE\ i

a qC^z @bq=dphi ? qi [SC^CrCq^b

yq 4 Ypb @C; b^<Ysxb @C; ~qsb } ^SfCpS@ @C@C3qs Y Q} ^3
G <-Y@ @C} ^3 K-\ - QGK, >|CEui

ci rSz\ -s [~YS LC^zSi |i d-@q Cs, q ~Sz-q Si R dphi ? qi [SC^C
rCq^bi RR } ^SfCpS@ @C@C3qs Yi RR G <-Y@ @C} ^3 K-\ -i Ri; -z-YLb @C
d-@q Cs, q ~Sz-q S=} \ - , Sxb a qL ^S- <S^-Ye-q rSz\ -s [~YS LC^zS

; ?} CE=cJc=CEiv

y-S-q r- ^zbs pCS

Catálogo de Padrões Arquiteturais: Uma Visão Organizacional para Sistemas Multiagentes

[b^bLq " - s~4\ Gz@ - b<~qsb @CLq @- éxb
C\ B^LC^P- q\$ @Crblz.: q@ } ^SfGps@ @C
@C 3q s Y > <b\ b qI ~SSb e- qS Ye- q b4Q
zC^éxb @by z- Y @C3- <P- qYC\ B^LC^P- q\$
@Crblz.: qI

yq 4- Yb - eqf- @bi 3q s Y >? G>{ @C U^Pb @C | @Eu=

Prof^a. Dr^a. Milene Serrano
a qC^z- @bq

Prof. Dr. Maurício Serrano
; bbqC^z- @bq

Titulação e Nome do Professor
Convidado 01
; b^fS@ @b c

Titulação e Nome do Professor
Convidado 02
; b^fS@ @b |

3q s Y >? G
| @Eu

BszCzq 4 Yb @CS- @b Â zb@bs -l~CCs l~G \ Cs\ b @fS@ ^@b @CsS \ Cs\ bs>Hbq \ Â
Yz G>ebqz ^zb>fC^<Cq \ i

, Lq @C S C^zbs

, Lq @Céb - bs \ C-s e- S>K C^S, ^- sz- S C Gq ^ S<b 3- q4bs- l ~C \ C<f q \ e- q sCq C<C^zC^ - eq" ssxbl ~CC- Gsb YC ssG, Lq @Céb - b \ C- Sij \ xb>X~< s 3- q4bs- >ebq b- fSij \ C-s @C- 4 Hhs @-q ^zC- Lq @- éxb C ebq zCq sSéb ~\ C C\ eY @ C C Cq \ S' - éxb C @S- S' - ^bs Csz~@bsi, Lq @Céb Ás - \ S- s l ~C \ C - <b \ e- ^P- \ P-z- ^zbs - ^bs>C\ CseC S Y; -fz- K S C C X- %; Sij ~Cij > Xbq C^ - KS ^^C C [- f' - [- L- Y x C si

, Lq @Céb - bs \ C-s <YL- s @C <- qsb ebq zCq \ sSéb zxb sC^s- <S^ - S C C \ \ ~Sbs \ b \ C^zbs> Hq \ fCq @ Cij ps eq H C ssbq C si ; b \ \ C-s <bYL- s - eq C^ @S- S ebq^a^ S C b sL^S <- @b @C D ~S C> zS- > q seb^s- 4 S S @ @ C C e- S ^ < S i B \ CseC S Y- Lq @Céb - bs - \ S Q Lbs, zz- ^% q U b> ; Y S b^ K b \ C s> z- Y r- Y S > T- Y S ^- , Y C S @ > V C S ; q s z S^ - > X C b^ - q eb ; - \ 4 q S > d P C S C,, C^ C p y^a \ - q 3- q4bs- > Cr q L S 3 C C q i

, Lq @Céb - b \ C- - zC^ < S sb C <- f' P sb ^- \ bq @b > d- ~Y [- q W si dbqz ^z- s f C C s \ C C^ < b q U ~ C s C \ eq C sz C f C - b \ C- Y @b > z b q C^ @b e C b \ C- s ~< C s s i r C \ @ f S @ s > s- - eq C S C^ é- z b q^ b- \ S' P- Lq @- éxb \ - S @ f C q z S @ C < b Y b q @ i

, Lq @Céb - bs \ C-s b q C^ z- @ b q S > [S C^ C r C q i ^ b C [- ~q < S r C q i ^ b i G b S ~\ - S C^s - Y L q S eb C q ~s- H q- S i @b < b^ P C S \ C^z b @ C - \ 4 bs > s C \ eq e- < S^ z C s C @ C S- @bs - bs - Y^bsi

, Lq @Céb > ebq" \ > - zb @bs bs eq H C ssbq C s l ~C z b q^ - q \ z b @b C sz C e p < C s s b - C^ e C q q f ^ S \ - S S ebqz ^z C @ \ S' P- f S @ i

pG~\ b

rSz\ -s [~YS LC^zGs fr[, gsb ~\ e-q @L\ - C' << e-q eqpLz-qC @Gc^fbYfCq sSsQ
z\ -s @C sbH. : q <b\ eYfbsi B^zqz ^zb>l ~ ^@b -LC^zGs S^zCq LC \ ~Sb YfC\ C^zC
b- @CHq\ - @Csbq\ ^S- @>- @S^a\ S- @GssGs sSz\ -s zbc^-\ qC< z<- si } \ - - YCq^- Q
zsf- >fS- ^@b \ S^S\ S-qC- ~fSS q ^Gss- l ~Cszxb>Csz-^ - @C ^S^xb eq fS @C ~\ e-@qb
-q ~Sz~q Y- @C ~ @b -b sC- @Gc^fbYfS C^zbi } zSS- @bs <bqz-\ C^zC>e- @q Gs -q ~SQ
zCz-q S eb@C\ ~\ C^z-q- eq@-zSfS@ @C C- l ~ Y@ @C @bs sSz\ -s @Gc^fbYfSbsi ,
@Sb^SIS - éxb @ @C<qb @GzGs e- @q Gs ~\ S^zq\ C^zb e-q sS eY <qeq<Gssbs
@C- ^- YSC @GSL^ @Cr[, t q@~S^@b b GsHqpb -ssb<S @b CHq^C^@b s-ebqC\ a\ Q
4Sbz <^Sb Cszqz Lsb ^b eq<Gssb @C @Gc^fbYfS C^zb @CsbH. : qI ; -4C @Csz <qI ~C
bs \ zb@bs C-s z <^S- s @C @GSL^ bq\ ^S- <S^ -Yeb@C\ sCq ~zSS- @bs <b\ b eqf <eSs
-q ~Sz~q S e-q r[, > <b^zqf^S^@b e-q - q@-éxb @ <b\ eYfS@ @C @GssGs sSz\ -si
? S ^zC @Gss- eq4Y\ ~z<- >b eqfC^zC zq 4 Ypb 4-s<>- e-qf@ ~zSS- éxb @ z <^S-
@C qfS^xb sSz\ ~z<- >S@^zS <qe- @q Gs -q ~Sz~q S bq\ ^S- <S^ -S e-q r[, ~zSSQ
<- @bs C\ @SfCqbs <b^zCfzbsi a eqf <S- Yb4CzSfb @GssC zq 4 Ypb - CY4bq éxb @C ~\
<z- YLb @Ce- @q Gs -q ~Sz~q S <C^zq @bs ^b e-q @L\ - @Cr[, i BssC<z- YLb <b^zCq-
bs e- @q Gs -q ~Sz~q S -eqfC^z- @bs ^b ^ fCY@C \ b@CYLC >@C S eY\ C^z-éxb 4C\
<b\ b b-zqps @Cz- YCs qCf ^zCs>eCq\ SS^@b -ebS qb -q ~Sz~q @CsbH. : q ^b eq<Gssb
@C Gs<bP- C^ - S eY\ C^z-éxb @C ~\ b- \ -S e- @q Gs -q ~Sz~q S >~s ^@bqps <b\ b -
4sC^C- q ~Sz~q Ybq\ ^S- <S^ -Y^b @Gc^fbYfS C^zb @Cr[, i

Palavras-chaves=rSz\ -s [~YS LC^zGs>d- @q Gs , q ~Sz~q S>Bszq-z-q s a q\ ^S- Q
<S^ - Si

, 4szq <z

[~YS LC^z r%sz\ s fl , rg-qC-^ C C-zsfCe-q @SL\ Hbq @GSL^S'L-^@ @CfCbeS'L <b\ Q
eYtGs sbHz .: qC s%sz\ si y PCqHbq>SH LC^zs S'zCq <z fCq%bqC%bqS' - @SbqL-^S C@-^@
@%b- \ S< ...%os%sz\ s <b-Y@ 4C<b\ C <P- bzSi a ^C- YCq'-zsfC>S' bq@Cq zb \ S'S S C-^@
-ssSz S' zPS\ -zzCq>S S' eqbq @C' ^Sb^ bH ^ -qPSzCz-q Ye-zzCq^>s-SzC@ zb SzS @CfCQ
be\ C'zi } sC@edpeCq%q- qPSzCz-q Ysz-^@ q@s <-^ S'<q sCzPCedp@-zsfS%o ^@l -- Yz%o
bH@CfCbeC@s%sz\ si y PCedpfSS^ bHzPC @Cs<qezb^ bHzPCsCsz-^@ q@s -^@S'szq-\ C'z
zb sS eY%edp<CssCs bH ^- Yss -^@ @GSL^ bHl , rt q@<-S'L-ssb<S zC@ C bqz-^@edpQ
fS@S'L zC<P^S<-Y-^@ szq zLS< s-eebq S' zPC sbHz .: qC @CfCbe\ C'z edp<Cssi Rz \ ~sz 4C
^bzC@ zP-z bqL-^S-zb^-Y@GSL^ \ CzPb@s -^@ zC<P^S ~Cs <-^ 4C ~sC@-s - @z-4-sC Hbq
[, r><b^zqf4-zS'L zb zPC qC@<zb^ bH%sz\ <b\ eYtS%aR^ bq@Cq zb <b^zqf4-zC zb sbYfC
zPS eq4Y\ >zPCeqsC^z..bqWscCw>zPq-LP zPC~sCbHzPCs%sz\ -zS< qfSC...zC<P^S ~C<
zb S@C^zS%bqL-^S-zb^-Y- qPSzCz-q Ye-zzCq^s Hbq[, r ~sC@S' @S Cq^z <b^zCtzi y PC
\ -S' b4UCzsfCbHzPS ..bqWszPCCY 4bq zb^ bH <-z YbL bH qPSzCz-q Ye-zzCq^s Hb<-sC@
b^ zPC[, r e-q @SL\ i y PS <-z YbL ...SY<b^z S' zPC- qPSzCz-q Ysz-^@ q@s eqCsC^zC@-z
zPC\ b@OS^L>S eY\ C'z-zb^ -^@bzPCq qCf-^z @Cz-Ss>-ssSzS'L zPC sbHz .: qC- qPSzCz
S' zPCsCC<zb^ -^@S eY\ C'z-zb^ edp<Css bHb^Cbq\ bqC- qPSzCz-q Ysz-^@ q@s>~sS'L
Sz-s zPC- qPSzCz-q YbqL-^S-zb^-Y4-sOS^C S' zPC @CfCbe\ C'z bHl , ri

Key-words=[~YS LC^z s%sz\ s>, qPSzCz-q Ye-zzCq^s>a qL-^S-zb^-Yr zq<-z-qSi

XSZ @CSZsq é Cs

```
GSL~q c ? S C's G @b -LC^zG Gb^zG=Kqss f|CEg yq @<S@bi i i i i i i i i i i |u
GSL~q | Bszq-z-q @Cr| , i Gb^zG=TC^S'LS f|CEE e~@rBpp, ] a>|CEg i i i | _
GSL~q { Bszq-z-q @b e-@qb @CeqUCzb, 4szq <G <bq%Gb^zG=K-\ \ - fc__lg {{
GSL~q J ; b^z-S'Cs CeYz-Hbq\ -si Gb^zG=; -Sf|CEg i i i i i i i i i i i i i i {D
GSL~q I GY†b @C-zfS@ @G e-q b @Gc^fbYfS\ C^zb @b y; ; €ci i i i i i i i i IJ
GSL~q v GY†b @C-zfS@ @G e-q b @Gc^fbYfS\ C^zb @b y; ; €|i i i i i i i i Jv
GSL~q u , 4bq@LC @CqfSxb sSz\ -zS- C\ zq sHsGsi yq @<S@bi Gb^zG=3RQ
a X; OR RCz -Y>|CEi i i i i i i i i i i i i i i i i i i i i i i i i i i i Ju
GSL~q D GY†b @C-zfS@ @G e-q qfSxb sSz\ -zS- i i i i i i i i i i i i i i i i JD
GSL~q _ GY†b @C-zfS@ @G e-q b @Gc^fbYfS\ C^zb @CsbH. : qI i i i i i i i i ICE
GSL~q cE B†zq éxb @Ce-@q Gs Cb <Sb @Cfs@ @C~\ e-@qbi Gb^zG=T^Ssq Cz
-Yf|CEE -e-@VarVR RBr>|CEg i i i i i i i i i i i i i i i i i i i i i i i i IJ
GSL~q cc ; b\ \ ~^S- zfC- <zi Gb^zG=3CYS@ S'CCz -Yf|CEE>e-Li {|gi i i i i i vCE
GSL~q c| [ b@Cb} [ X@ PSCq q ~S @ <YssC 3CP fs~q Gb^zG=3CYS@ S'CCz
-Yf|CEg i i i i i i i i i i i i i i i i i i i i i i i i i i i i i i v{
GSL~q c{ dqzb<bY @CR^zCq éxb GRl, Q b^zq <Q Ci Gb^zG=3CYS@ S'CCz -Y
f|CEE>e-Li {vg i i i i i i i i i i i i i i i i i i i i i i i i i i i vJ
GSL~q cJ dqzb<bY @CS^zCq éxb GRl, ; b^zq <z] Ci Gb^zG=3CYS@ S'C>; -SfCC
KqC^.bb@f|CEE>e-Li {|gi i i i i i i i i i i i i i i i i i i i i i i i i vI
GSL~q cI ; b\ \ ~^S- zfC- <zi Gb^zG=3CYS@ S'CCz -Yf|CEE>e-Li {|gi i i i i i vV
GSL~q cv [ b@Cb} [ X@ PSCq q ~S @ <YssC 3CP fs~q Gb^zG=3CYS@ S'CCz
-Yf|CEg i i i i i i i i i i i i i i i i i i i i i i i i i i i i i i v_
GSL~q cu dqzb<bY @CR^zCq éxb GRl, Q b^zq <Q Ci Gb^zG=3CYS@ S'CCz -Y
f|CEE>e-Li {vg i i i i i i i i i i i i i i i i i i i i i i i i i i i uCE
GSL~q cD dqzb<bY @CS^zCq éxb GRl, ; b^zq <z] Ci Gb^zG=3CYS@ S'C>; -SfCC
KqC^.bb@f|CEE>e-Li {|gi i i i i i i i i i i i i i i i i i i i i i i i i uc
GSL~q c_ r- @s @b <b^sbY=S'SS YS-éxb @ eYz-Hbq\ -i i i i i i i i i i i i i i |I
GSL~q |CE dYz-Hbq\ - T, ?B i i i i i i i i i i i i i i i i i i i i i i i i i i |I
GSL~q |c r- @s @b <b^sbY=zC^z-zf-s @C<b\ eq @b -LC^zC<b\ eq @bq i i i i i _V
GSL~q || R^zGqH<Ce-q <z-YL-éxb @bs Yfpsi i i i i i i i i i i i i i i i i i i i |V
GSL~q |{ r- @s @b <b^sbY=" ^- YS-éxb @ <b\ eq i i i i i i i i i i i i i i i i i i i |V
```


XSz @Cz 4Cys

y-4Cf c ; YssS <- éxb @bs e- @q Cs @CeqUzb Ka Gi Gb^zG=K-\ \ - fc_Ig i i i {J
 y-4Cf | ; YssS <- éxb @ eGsl ~S- <S^z" <- l ~- ^zb -bs b4UzSfbsi i i i i i i i i JJ
 y-4Cf { [Gzb@bLS @CeGsl ~S- i JJ
 y-4Cf J ; q^bLq \ - @C-zfS@ @Gs @by; ; €ci ICE
 y-4Cf I ; q^bLq \ - @C-zfS@ @Gs @by; ; €|i ICE
 y-4Cf v pGs~Z- @bs b4zS@bs <b\ - szq^L S'SS Yi ID
 y-4Cf u , zbs <b\ ~^S- zfbs GRl, iyq @~<S@bi Gb^zG=3CXYH S^G>; -SfCCKqQ
 C^..bb@f|EE>e-Li c_g i vc
 y-4Cf D , zbs <b\ ~^S- zfbs GRl, iyq @~<S@bi Gb^zG=3CXYH S^G>; -SfCCKqQ
 C^..bb@f|EE>e-Li c_g i vu

XSZ @C-4CfS z~q s CsLYs

- , ; X , LC^z; b\ \ ~^S<-zb^ X ^L~ LC
- , R , LC^z R@^S^ Cq
- , [r , LC^z [- ^-LC\ C^zr %sz\
- ? G ? S<G-zbq%G- <S< z bq
- GRl, Gb~^@ zb^ Hbq R^zCY\LC^z dP%S<- Y, LC^zs
- T, ? B T-f , LC^z ? BfCbe\ C^z Gq \ C.bqW
- pr pCfSxb rSz\ -zS<
- r[, rSz\ -s [~YS LC^zGs
- y; ; yq 4 Yb @C; b^<Y-sxb @C; ~qsb
- yR yG^bYLS @ R^Hbq\ -éxb
- } ^3 } ^SfCpS@ @C @C 3q s YS

1	INTRODUÇÃO	23
1.1	Contextualização	23
1.2	Justificativa	24
1.3	Objetivos	25
1.4	Organização dos capítulos	26
2	REFERENCIAL TEÓRICO	27
2.1	Agentes	27
2.2	Sistemas multiagentes	28
2.3	Arquitetura de software	29
2.4	Padrão arquitetural	30
2.5	Estruturas organizacionais	31
2.6	Padrão de projeto	32
2.7	Catálogo de padrões	34
2.8	Considerações parciais	34
3	SUPORTE TECNOLÓGICO	37
3.1	Sistemas Multiagentes	37
3.1.1.1	Arquitetura da plataforma JADE	38
3.2	Ferramentas de apoio	39
3.2.1	3b^S- 3d[{_
3.2.2	yqYB	{_
3.2.3	?CS^	JCE
3.2.4	B-YesCRB	JCE
3.2.5	KS	JCE
3.2.6	KSP-4	JCE
3.2.7	XyCt	JCE
3.2.8	d-eCC\$	Jc
3.2.8.1	Parsifal	41
3.3	Considerações parciais	41
4	METODOLOGIA	43
4.1	Metodologias de pesquisa	43
4.2	Escolhas metodológicas	44
4.3	Fluxo de atividades para condução do TCC	45

c Rzp@éxb

BszC < e z- Y z\ < b\ b b4UzSfb < b^zCfz~ Y- q- eGsl ~S- > - eqsC^z- q- l ~Cszxb
@C eGsl ~S- - sCq S'fCszL- @ > U-szS' < q e- q eqpebq ~\ Csz- @b ^b z\ - > @Cs<cfCq bs
b4UzSfbs - sCq\ - Y- ^é- @bs C>ebq" \ > - eqsC^z- q- bql- ^S- éxib

cic ; b^zCfz~ Y- éxb

, ~zSS- éxb @C - LC^zGs @C sbH.: qC < b^szSz-S ~\ - - 4bq@ LC\ - @d ~- @ e- q -
< b^<Ceéxb C- < b^szq-éxb @C sSzC\ - s < b\ eYfbs C @Szqf~ @bs fT} | Ra p Cz - Y> | CEEg
y- S- - LC^zGs < b^PG<C\ bs S'zCqssGs @bs ~s~ efs Ceb@C\ - LSq @C Hbq\ - ~- z ^b\ - C\
eqpY@bs \ Gs\ bsi , b S'f s @C CfCqCq < b^zpbYC < b\ eYzb> b e- eCY@bs ~s~ efs @<C<
eqfHq^<S Y C^zC> @C Hbq\ - < bbeCq zsf- < b\ bs - LC^zGs @C sbH.: qC @C \ b@b l ~C GssGs
YS bs ebss- \ ~- †SS q GssGs ~s~ efs ^b < ~\ eqf\ C^zb @C s~ - s \ Cz- s fKpBB] Cz - Y>
c__ugj

, LC^zGs @C sbH.: qC @CseCqz \ b S'zCqssC @C @SfCqpbs eGsl ~S- @bqGs C\ eqs- s
@C sbH.: qC fKpBB] Cz - Y> c__ugj yqz- qC @C ~\ - - eG l ~C Csz- C\ CqfS^b q eS@ Q
\ C^zC@C^zpb @ yRfIB] | Rj Krt., a a X? pR KB> c__vg< b\ b ~\ e- q @S\ - eb@Cqpsb
e- q eqpUz- qC@CsC^fbyCqsszC\ - s @CsbH.: qC < b\ eYfbs fS, [3a] BXXR TB] | Rj Krt
, a a X? pR KB> | CEEg

rSzC\ - s [~YS LC^zGs fr [, g C^< b^zq \ Cse- éb C\ ~\ - s qC @C @b\ ^Sbs @C
- eY- éxb> < b\ b= < b\ qSb Cqzq ^Sb> @CsL^ @C S'zCqH<C> Ublbs C LGszxb @C eqp<Gssbs
S@-szqf S C < b\ Cq-S S < b\ eYfbs fIB] | Rj Krt., a a X? pR KB> c__vgj KqC^ Cz - Y
fc__ug- eb^z- \ b-zq s -eG- s @C - eY- éxb < b\ b < b^zpbYC @C zq-HLb - qb> @z- \ S^S^L>
qC~eCq éxb C LGszxb @ S^Hbq\ - éxb> C@<- éxb C- ssSzC^zGs @LSz- S eCsb- S fdCqsb^ - Y
?LSz- Y, ssSz ^z>d?, sgl

} \ - @s - q\ - @SP- s - eb^z- @s ebq,, bbY@q@LC f| CEE> e-Li | Jvg b<bqC l ~- ^@b
- LC^zGs S'zCq LC\ \ ~Sb YfC\ C^zC b- @C Hbq\ - @Csbql- ^S- @i, @S^a S- @Cr [,
< b\ eYf- C> ebqz- ^zb> eb@C sC zbq^ - q < zS- i d- q @Cs<b4qf b l ~C - < b^zC-Cq- C\ sCq
L- S@ ^b sSzC\ - > \ ~S- s fC Gs> ^C<Gss- efb CfC~z- qb sSzC\ - qeCzS@ \ C^zG a ^ \ Cpb
@C - LC^zGs z \ 4 \ S^~C^S C\ zCq\ bs @C < b\ eYfS@ @C e- q LCqf @C Hbq\ - C < < b
sSzC\ - i

R@CeC^@C^zC\ C^zC @b e- q @S\ - - @bz- @b> P- 4Sz- Yl ~C @CsC^fbyC@bqGs < b\ Cq
< C\ - < b@S < q sC\ ~\ - - q ~S<Z- q Hbq\ - Y<Yq C 4C\ @C ^S@ fpR O, p?r> | CEI g
a qS- Y- @b @Csz- eqzS- > Hd ~C^zC\ C^zC> ~\ - < bYéxb @C \ @- Ybs @C < @SbqH^zC
@Csbql- ^S- @bs>l ~C^xb ebss- C\ e- e S>qfseb^s- 4SS@ @Cs CqY<S^~\ C^zbs < Yfbs ~^s

<b\ bs b-zpsi

rL~^@b pSP-q@ f|CEI g>-eY<-é Gs l~C ^xb ebss~C\ ~\ - -d ~SZ-q Hh\ -Y
sxb Lq Y C^zC -<beY@s>l~C4q @e s>@HKCS @C \ ~@ q C sC\ ~\ - fSxb b~ @SfCxb
<Yq i k ~Gsz Gs 4~s~s sb4qC S\ eY^z- éxb>\ - ^~z^éxb C Gs<- Y4S@ @C @GssCs sSzC\ -s
sxb @HKCS @C^ ^Sj

} \ - -YQ^~zsf- -@bz-qe-@q Gs -d ~SZ-q Ssi BszCs -U@ \ - @C^Sj-s <q <Q
zCqsZs~s 4~s~s Cb <b\ ebq\ C^zb @C~\ - -eY<- éxb fpR O, p?r>|CEI g a -d ~SZzb
@C sbH..: qC @CfC <b^PGCq -s <q <zCqsZs~s> eb^zbs Hh\Cs C H\ <bs @C <@ e-@qb -qQ
l~SZ-q Y- "\ @Cbez-qebq-l~Ccl~C-z^@ Âs s--s ^C-Gss@ @Cs C-bs sC-s b4Uzsfbs
<b\ CqS S GseG<" <bsi

? C- <bq@b <b\ rP...fc_vg>@Cs<qf Gs ~^Hh\ Gs @s-d ~SZ-q s>l ~- ^@b @SsbQ
^ fCS>sxb S'szq\ C^zbs e-q sS\ eY<- <q Gsz Gs<bP-i rL~^@b , fLqfb~ CŠ@^ f|CEI g>
b eq<Gssb @C @Cs<CfCq C^<b^zq qC-eY<- qe-@q Gs -d ~SZ-q S^ - eq-zs- S^@ YqQ
L~ C^zC -@Pb< C^xb sSzC\ -zSbi Rzb sC @CfC - f-é s l~Csz Gs l~C-S^ ^xb Hh\ \
qsbY@ s <b\ b>ebq C\ eY>C\ qY éxb Â<YssS<- éxb b- <z YL- éxb @C e-@q Gs l~C
eb@C\ sCq~s- @bs ebq-d ~SZbs @C sbH..: qf

; -4C @Gsz <q l~C C\ SzC ~\ e-q Yb C^zqC - <b\ eY<S@ @C @s bql- ^S-é Gs C
bs r[, i a ql- ^S-é Gs sxb C^z@ @Cs <b\ eY<-s Hh\ -@s e-q s-eCq q f-é s Y\ Sz-é Gs
@CSsz^<S s S^@fS@- S>z S <b\ b Y\ Sz-é Gs <bL^Szf-s>Hs<-s>z\ ebq S CS'sz~<SbQ
^-S f, , py>|CEI g] GszCsC^z@>sxb ~zS@- @bs <b^<Czbs>\ zb@bs Cz <^S-s @C @GSL^
bql- ^S- <S^~YP~\ - ^b <b\ b eqf<eSbs-d ~SZ ^Sbs e-q r[, f, , py>|CEI g

} \ - bql- ^S- éxb Hh\ C~\ - Gzq-z-q e-q -s S'zCq é Gs @bs-LC^zGs-zq f s @
@C^Sxb @Ce-e S>Cf eCz-zsf-s @C <b\ ebq\ C^zb CqY é Gs @C-~zbq@ @Cfr^ ; , p, >
c_Dg , s bql- ^S-é Gs sxb>C\ Lq Y<b^<Cz~ Y-@s C\ zC\ bs @Cs-- Gzq-z-q>Szb >
be-@qb @CS Hh\ -é Gs CqY é Gs @C<b^zqYCl~CC\ SzC\ C^zqCbs-LC^zGs C- @Szqf~Sxb
@s <e- <S@ @Cs @CqsbY éxb @Ceq4Y\ -s C^zqC C\ fr^ ; , p, >c_Dg

] - qsbY éxb <bbeCq zsf- @Ceq4Y\ -s>ebqC\ eY>~\ - Gzq-z-q Hh\ C~C- <@
-LC^zC~\ - fSxb @C- Yb ^ fCY@C <b\ b b Lq-eb sbY<S^~ eq4Y\ -s fr^ ; , p, >c_Dg
dbqz ^zb- Gzq-z-q bql- ^S- <S^~ Y\ e CqSzqf Gs sb4qC-s Hh\ -s <b\ b bs-LC^zGs sC
<b\ ~^S- \ CsC<bq@C~\ i] GszC<b^zCz>bs e-@q Gs -d ~SZ-q S e-q r[, 4-sC @bs
C\ Gzq-z-q s bql- ^S- <S^~ S>eb@C\ Hh\ C~CqsbY é Gs eq-zs- s e-q b @CS^ fbY\ C^zb
@Cr[, <b\ eY<bs>sC^@b -ss\ >sxb b4Uzbs @C Gsz~@b @GzCzq 4- Ybi

ci| T~szS <- zsf-

, @C^Sxb eq fS @C~\ e-@qb -d ~SZ-q Ye-q b @Cs^ fbY\ C^zb @C~\ sS@
zC\ - qCf- ^zC^b @Cs^ fbY\ C^zb @C sbH..: q< <b\ b Cfs@C^<S @b ^- sCéxb - ^zCfbq rC

mb /Qb +Q` `2i K2Mi2- T /` ä2b `[mBi2im` Bb TQ/2K mK2Mi`
/ /2 / b THB+ ä2b /2b2M p Q H p 2B k by X

1K pBbi /BbbQ- mK / b 7Q`K b /2 2bi`mim` ` mK aJ 2bi€ 2
tB/ /2 /Q K2bKQX SQ` +QMb2;mB Mi2- 2}+B M+B /Q bBbi2K
/Q T`Q#H2K Q [m H Q bBbi2K #mb+ `2bQH p p PTG b b A.: b 2` K B
kyy-NT€;X kjeVX

JmBi b `[mBi2im` b T ` aJ i K bB/Q T`QTQbi b +QKQ +Q
/2EQHT- :BQ`;BMB 2UyyWQT r MBQ U2y yHX 1Mi`2i MiQ- BM/ 2tB
TQm+Qb 2bim/Qb [m2`29M Ki Bb T`QTQbi b /2 7Q`K pQHi / T
`[mBi2im` Bb 2K MQp2H Q`; MBx +BQM H /2 #bi` 1/2 QX

*QMbi i / b 2bb b /B}+mH/ /2b- 2bi2i` # H?Q T`QTä2`2bT
[m Bb b 1/2 Q Qb T`BM+BT Bb T /` ä2b `[mBi2im` Bb 2K MQp2H /2
aJ \ P b T /` ä2b `[mBi2im` Bb +Q` / /Qb M2bb2 h** b2`1/2 Q- b2
H;mMb- M 1/2 Q T2M b B/2MiB}+ /Qb- +QKQ i K#ûK KQ/2H /Qb
TQ/2K b2`pB` +QKQ `272` M+B b MQb /2b2MpQH p BK2MiQb /2
BKTH2K2Mi 1/2 Q /2bb2bX

*QMbB/2` M/Q 2bb2 T MQ` K - 2H #Q` 1/2 Q /2 mK + i€H
`[mBi2iQ /2 bQ7ir `2 M b i `27 b /2 2b+QH? - KQ/2H ;2K 2 BKT
`[mBi2im` H Q`; MBx +BQM H T ` aJ - `2/mxBM/Q Q 2b7Q`IQ 2
bbQ+B /Qb- b2`€ /2 mK p HB +QMbB/2`€p2H- i MiQ MQ •K#B
T`Q+2bbQ /2 /2b2MpQH p BK2MiQ /2 aJ X

RXj P#D2iBpQb

P Q#D2iBpQ ;2` H /2bi2i` # H?Q û /2}MB` mK + i€HQ;Q /2
aJ [m2 b2 2M[m /` K +QKQ 2bi`mim` b Q`; MBx +BQM BbX

oBb M/Q iBM;B` Q Q#D2iBpQ ;2` H- 7Q` K 2bi #2H2+B/Q
Qb [m Bb b 1/2 Q T`2b2Mi /Qb b2;mB` ,

RX/2MiB}+ ` KQ/2HQb `[mBi2im` Bb /2 aJ + M/B/ iQb T /`

kXa2H2+BQM ` KQ/2HQb `[mBi2im` Bb [m2 b2 + ` +i2`Bx K +

jXJQ/2H ` Qb T /` ä2b `[mBi2im` Bb mb M/Q MQi 1/2 Q T`QT`

9XAKTH2K2Mi ` Qb T /` ä2b `[mBi2im` BbX

RX9 P` ; MBx i1/2Q /Qb + TQimHQb

1bi2 i` # H?Q /2 +QM+Hmb1/2Q /2 +m`bQ 2bi€ Q` ; MBx /Q 2K b
#`2p2K2Mi2 b2;mB` ,

Ç * TQimR@ AMi`Q/mi`1/2Q,imHQ im H- MQ [m H b1/2Q T`2b2Mi /Qb
DmbiB}+ iBp - [m2bi1/2Q /2 T2b[mBb #2K +QKQ Qb Q#D2iBpQ

Ç * TQimH@ _272`2M+B H/2bH`B+pQ,Qb +QM+2BiQb bbQ+B /Qb`
/2 aQ7ir`22 Q /QKQMBQ /2 B Mi2`2bb2 /2bb2 i` # H?Q- MQ + b

Ç * TQimjH@ amTQ`i2 i2+MQH2;B+M, b 72`` K2Mi b [m2 bmTQ`i
iBpB/ /2b /2 /2b2MpQHpbK2MiQ /2 bQ7ir`2- ;2`2M+B K2MiQ
Qmi` bc

Ç * TQim9H@ J2iQ/QH2bB #,2H2+2 Qb T`Q+2/BK2MiQb b2`2K b2;m
iû +QM+Hmb1/2Q /Q i` # H?Qc

Ç * TQim8H@ S`QTQ/2ibi,BM /Q T`2b2Mi i1/2Q / T`QTQbi /Q i` #
mK iQ/Q- /2}MBM/Q 2bi`mim` /Q + i€HQ;Q /2 T /`ä2b `[mBi2
/2 b2H2i1/2Q /2 T /`ä2b /2 T`QD2iQ 2 + i2;Q`Bx i1/2Q /Qb K2bKQ

Ç * TQim6H@ _2bmHi /Qb T T+2bBMj Qb`2bmHi /Qb H+ Mİ /Qb
K2MiQX

k _272`2M+B H i2!`B+Q

L2bi2 + TQimHQ- b½Q T`2b2Mi / b b # b2b i2!`B+ b T`
 pBb M/Q 7 +BHBi` Q 2Mi2M/BK2MiQ /Qb i2`KQb miBHBx /QbX
 b2Iä2bXL bXkXkXb½Q /2b+`BiQb Qb +QM+2BiQb /2 ;2Mi2b 2 aJ
 L b b2Iä2bX9 #Q` / @b2 mK i2K€iB+ K Bb 2bT2+Q}+ /2 `[m
 #2K +QKQ b½Q T`2b2Mi /Qb Qb T /`ä2b kXkXbBi2im`Bb Q L; MBi
 +BQM Bb b½Q TQMi / b +QKQ T`BM+QTbQb `[mBi2im` Bb[m
 T /`ä2b `[mBi2im` Bb T` aXkXkXb2iä2b /2}MBi½Q /2 T /½Q
 T`QD2iQ 2 + i€HQ;Q /2 T /`ä2b #2K +QKQ KQiBp İ½Q T` 7 x

kXR ;2Mi2b

1tBbi2K /B72`2Mi2b /2}MBiä2b T` ;2Mi2bX BM/ bbBK-
 +QM+2BiQb #€bB+Qb 2K +QK mK? mQ QkXkX2`2MQİ½Q /2 ;2Mi2
 b2m K#B2Mi2 2 bm miQMqKB XCS M MB Mm bQ2 qQCNM`BmK2
 /2}MBi½Q ~2tQp2H T` ;2Mi2b û [m2 b½Q 2MiB/ /2b /2 bQ7ir
 `2 ;B` 2 iQK` /2+Bbä2b /2 7Q`K mi-MQK - +QK # b2 M b Hi2
 2bi½Q bBim HOBX9 2bi + [m2 ;2Mi2b b½Q bQ7ir`2 [m2 bBKm
 ?mK M -`2 HBx M/Q i`27 b [m2 TQ/2`B K b2` 2t2+mi / b TQ` T

;2Mi2b TQ/2K b2` `2T`2b2Mi /Qb TQ` b2Bb + ` +i2`QbiB+
 i` /Q M 6Bm` Ti #BHB/ /2- miQMqKB - Bmi2HB; M+B - KQ#
 +QQT2` İ½QX h Bb + ` +i2`QbiB+ b- im M/Q 2K +QMDmMiQ- i
 bmb+2iQp2H Km AanklyR Zm MiQ K BQ` 7Q` €`2 72+? / MQ /
 [m2H2 +QKTQM2Mi2 /Q bBbi2K TQ/2 b2` :+ AasklyR /Q +QKQ

IK ;2Mi2 TQ/2 i2` b2m +QKTQ`i K2MiQ Hi2` /Q T|b bm BKT
 +QK [m2 BbiQ û TQbbQp2H/ #BHB/ /2 /2` +BQ+BM
 p2x- û /2}MB/ +QKQ Q ;` m +QK [m2 û `2bTQMb€p2H T2HQ +QMi`Q
 ;` m +QK [m2 TQ/2 T` Qbb2;mB` 2K bm K2i BM/BpB/m H BM/2T2M
 2MpB / b /2 Qmi`Qb A;2My 2BXU

P ;2Mi2 i K#ûK b2 + ` +i2`Bx TQ` bm + T +B/ /2 /2` +BQ+BM
 2 b2mb +QM?2+BK2MiQbX P ;` m +QK [m2 Q ;2Mi2 TQbbmB 2bi +
 BMi2HBX *Q-MD mMi K2Mi2- ;2MQ#B H-Q[mb2b2Ki` i / ? #BHB/ /2 /2
 mK ;2Mi2 T bb ` / 2t2+mİ½Q /2 +QMi2tiQ T ` Qmi`QX Pm b2D - Q
 bm 2t2+mİ½Q 2K mK MQpQ +QMi2tiQ 2M[m_ MiQk k y W ûK b2m 2bi /C

BM7` @2bi`mim` Q72`2+B/ Qb ;2Mi2b TQ/2 T2`KBiB` [m2
 +BK2MiQb / [mB`B/Qb [m MiQ b2m 2bi /Q /m` Mi2 HQM;Qb T2`QQ/C
 i K#ûK T ` `Q#mbi2x /Qb ;2Mi2b /B Mi2 /2 TQbbQp2Bb 7 H? b 2
 P ;` m +QK [m2 BM7` @2bi`mim` +mKT`2T2i2Bb+UMiA-B Qb BMiBi
 k y y R X

/2K Bb- ;2Mi2b TQ/2 i2` b2m +QKTQ`i K2MiQ Hi2` /Q T|b bm BKT
 2K [m2 ;2Mi2b b2 +QK mMB+ K 2i` # H? K 2K +QQT2` İ½Q mMb +Q
 aBbi2K b JmHiB ;2Mk2y y R 1K b2MiB/Q b 2QCH/`Bi/2 2 C2MMBM;b
 URNM82bi + K Qmi`Qb i`B#miQb +QKQ ? #BHB/ /2 bQ+B H @ + `
 2Mi`2 ;2Mi2b i` pûb /2 HBM;m ;2K /2 T`Q;` K İ½Q pQHi / T ` ;2
 /Bx`2bT2BiQ ``2bTQM/2` 2K i2KTQ ?€#BH ``b Km/ Mİ b [m2 Q+Q`2
 T2HQ ;2Mi2 @ 2- TQ` }K- T`Q iBpB/ /2 @ ;2Mi2b TQbbm2K +QKTC
 Q [m2 bB;MB}+ [m2 TQbbm2K ? #BHB/ /2 /2 iQK ` BMB+B iBp b T

kXk aBbi2K b KmHiB ;2Mi2b

aBbi2K b JmHiB ;2Mi2b UaJ V 2M[m /` K@b2 MQ +2M€`BQ- C
 K Bb ;2Mi2b U>I_ 2i Hk y y d QT2` M/Q DmMiQb /2 KQ/Q `2 HBx `
 DmMiQ /2 i `27 b T ` b iBb7 x2` mK+G+Qm D r m m h2Bk2i; BMi2b
 +QK mMB+ K@b2 iBTB+ K2Mi2 i` pûb / i`Q+ /2 K2Mb ;2Mb i` p0
 `2/2 7Q`M Q P B G . U A . : 4k y y - N T € ; X j v X

G2bURNMNTQMi [m2 ;2Mi2b TQ/2K b2` + ` +i2`Bx /Qb +QKQ
 +QQT2` iBpQb Qm mi Q2HFMi B Mx2b2Mib2U +QQT2` iBpQb i` # H? H
 H+ Mİ ` Q#D2iBpQb +QK mMb- 2M[m MiQ ;2Mi2b miQ@B Mi2`2bb
 iQb /Q Q#D2iBpQ;2` H- K b BM/ B Mi2` ;2KT ` H+ Mİ ` bm b K2i
 + bQ- Qb ;2Mi2b miQ@B Mi2`2bb /Qb TQ/2K- i` pûb /2 i`Q+ /2 7
 Qmi`Qb ;2Mi2b- }K /2 [m2 2bi2b`2 HBx2K H;mK iBpB/ /2 T `
 b2mb T`i T`BQb Q#D2iBpQbX

a2;mM/QQH/`BkyAN- MQ + bQ K Bb ;2` H- Qb ;2Mi2b 2K mK
 i K Qm im K 2K MQK2 /Qb mbm€`BQb Qm T`QT`B2i€`BQb +QK
 p ä2bX S `[m2 B Mi2` D K +QK bm+2bbQ- i Bb ;2Mi2b 2tB;2H
 +QQ`/2M `2 M2;Q+B `mMb +QK Qb Qmi`Qb- / K2bK 7Q`K [m2
 +QQ`/2M `2 M2;Q+B ` +QK b Qmi`qB MG p_BV.:4QiyBTE;K jV X

*QKQ 2bi #2H2+MQR FmC 1LLAL-lay y-yT€;X 9k@9jV- bBbi2K
 iB ;2Mi2b TQbbm2K # bB+ K2Mi2 b2Bb 2H2K2MiQb, UBV ;2Mi2
 UBpV `2+m`bQb- UpV 2b72` /2 BM~m M+BB Mi2p B Q QK Qb 2Q
 2Mi`2 Qb ;2M#B2-D#i2K +QKQ 2Mi`2 Qb ;2Mi2b TQ` K2BQ /2 T`Qi
 Q`; MBxb B1Q @b2 /2Mi`Q /Q K#B2Mi2- /2i2`KBM M/Q [m Bb i
 T2HQb ;2Mi2b /2 KQ/Q b iBb7 x2` Qb mbm€`BQbX

6B;m` k 1bi`mim` /2 aC 2X M6CMi2yTm a 1__ LPkyRR
 X h` /mxB/QX

S `[m2 +QM+Hm K bm bi`27 b- Qb ;2Mi2b 2 Q`; MBx
 `2+m`T Qb 2Mi2b MQ aK#B 2Mj B X Tm C 1LLAL-lay y-yT€;X 9k@9jV 2t
 THB+ [m2 + / 2H2K2MiQb-7Q Mi02K BmK MmQ MK#B 2Mi2 2K M€HBb2
 2b72` `2T`2b2Mi BM~m M+B /2 + / 2H2K2MiQ /Q K#B2Mi2
 BKTQ`i•M+B T `[m2 Qb Q#D2iBpQb b2D K H+ Mİ /Qb +QK t

kXj `[mBi2im` /2 bQ7ir `2

/2+QKTQbBİ½Q /2 HiQ MQp2H /2 mK bBbi2K 2K +QKT
 i K2Mi2 +QK mK + ` +i2`Bx İ½Q /2 +QKQ 2bb2b +QKTQM2Mi2
 `[mBi2im` /2 bC 7Ar1 h2 b GklyT€;X kdNVX h` i @b2 / /2b+`Bİ½
 i2K b 2 +QKTQM2Mi2b /2 mK bBbi2K /2 bQ7ir "la 2> b L2H ä2b :
 >1LL1uc a*>JAklyyX

h Bb bm#bBbi2K b 2 +QKTQM2Mi2b b½Q KmBi b p2x2b 2bT2+
`2Mi2b TQMiqb /2 pBbi T ` KQbi` ` b T`QT`B2/ /2b 7mM+BQM Bb
/2 mK bBbi2K /2 b"Qa7i# J 2 Uc > 1LL1uc a* > J-Ak.yhVX `[mBi2im`
/2 mK bBbi2K /2 bQ7ir `2- TQ`i MiQ- û mK 2bi`mim` 2K H `; 2b
bQ7ir `2 [m2 `2~2i2 b /2+Bbä2b BMB+B oBb 2 2b b 2My+BX /Q T`QD

o H2`2bb Hi `[m2 `[mBi2im` û mK #bi` İ½Qi` Mb72`Qp2H
û mK # b2 T ` `2m oBb 2 2b b 2My+BX €;X k3yVX bbBK- #bi` İä2b
K Bb HiQ MQp2H TQ/2K +H bbB}+ ` @ b2 2K Hc /ò 2 2My+BX TrE BX2im` H U
k3kVX

kX9 S /`½Q `[mBi2im` H

p;2`BQm 2Uk/ywBM}M2K T /` ä2b `[mBi2im` Bb +QKQ bQHmİä2
H2+B/ b T ` T`Q#H2K b `[mBi2im` BbX h Bb bQHmİä2b Dm/ K /
T`QD2iQ /2 `[mBi2im` #2K +QKQ /2b+`2p2K i`B#miQb /2 [m HB/
`[mBi2im` Bb 7 +BHBi K +QKmMB+ İ½Q 2MF2? Q @ /2i`2p BMi2`2b
/2 mK pQ+ #mH€`BQ +QKmKX

S /` ä2b `[mBi2im` Bb b½Q +QMbB/2` /Qb +QKQ T `2b T`Q#H2
2K mK /2i2`KBM /Q +QMİ2tiQ 2 b2: 17_2iPKcTQ. I-Lk ywBM HûK /BbbQ-
mK T /`½Q M½Q T2M b BM/B+ +QKQ mK bQHmİ½Q `2bQHp2 mK T
2tTHQ+BiQ Q óTQ`[m ô/Q T`Q#H2K b2` `2bQHpB/Qc Qm b2D - [m
2K T `iB+mH1`_APlc w. I-Lk ywBX

/2b+`Bİ½Q /Qb T /` ä2b `[mBi2im` Bb # b2B @b2 MQi`BTûT`
Uo:1_APlc w. I-Lk ywBX SQ/2 i K#ûK b2` BM/ K Bb 2H #Q` /Q +QK K
H?2b- +QKQ TQ` 2t2KTHQ- H!;B+ TQ` i`€b / bQHmİ½QX 1K T
T`Q#H2K 7Q+ M b + mb b [m2 KQH/ K Q T`Q#H2K - 2M[m MiQ bC
2bb b + mb b b½Q ò2b_QAPlc w. I-Lk ywBX

>€ mK bû`B2 /2 TQbimH /Qb T ` mK bQHmİ½Q T `[m2 b2 [m
SQ` 2t2KTHQ- 2bi2 /2p2 + Tim` ` T`€iB+ +QKmK- Qm b2D - TQbb
İä2b +QM?2+B/ b 2- Q K2bKQ i2KTQ- bQHmİ½Q /2 p2. bL2` M½Q @
kyywBX

S /` ä2b TQ/2K b2` mb /Qb 2K +QK#BM İ½Q fR QM7Q2 @ 2 2tTHB-
`BQm 2 Uk/ywBX SQ/2K i` # H? ` 2K +QMDmMiQ 7Q`M2+2M/Q TQMiqb
i`2b /m` Mi2 Q T`QD2iQ BMB+B H Qm 2H #Q` M/Q mK /2i2`KBM /C
mb M/Q H;mK QmiäQ q-R`NwBX USQ`i MiQ- û TQbbQp2H [m2 ? D Mm
i2`/2T2M/ M+B b 2Miò21T APä 2 bw I-Lk ywBX 1bi b +QK#BM İä2b TQ/2
Q+Q` `2` `2T2iB/ K2Mi2- iû [m2 [m2biä2b /2 `[mBi2im` b2D K`2

iû+MB+ b /2 T`Q;` K İ½Q a Q M p 2 M M B Q M B b U

LQ i` # H ? a Q / 2 R N N T € ; X 8 V - / 2 b + ` B İ½Q / 2 + / T / ` ½Q BM +

Ç S`Q#H2K , Q T`Q#H2K 2K [m2 Q T / ` ½Q #mb+ bQHm+BQM

Ç *QMi2tiQ, bT2+iQb / +QM};m` İ½Q- +QKQ Q K#B2Mi2 +QK
Q mbQ /Q T / ` ½Qc

Ç aQHmİ½Q, Q KQ/2HQ /2 bBbi2K + Tim` /Q T2HQ T / ` ½Q- Q
2 2bi`mim` b /2 +QMi`QH2 [m2 +QKTä2K Q T / ` ½Qc

Ç .B ;` K , mK } ;m` [m2 KQbi` mK T / ` ½Q iQT B+Qc

Ç o `B Mi2b bB;MB}+ iBp b, MQi b bQ#`2 TQbbQp2Bb p `B İä

Ç 1t2KTHQb, `272` M+B bQp2t2p2Hb b iQ K b MQb [m Bb b2 T
T / ` ½QX

kX8 1bi`mim` b Q`; MBx +BQM Bb

h2Q`B b pQHi / b "b 2bi`mim` b bQ+B Bb +QMi`B#m2K T ` /
/2 aJ +QKQ B Mi2M+BQM HB/ / E P2GSG +: B # B A B A c 2JUG P-SPIGP
kyyeX .2Mi`2 2bb b i2Q`B b- Qb T2b[mBb /Q`2b pQHi ` K@b2 T
bmHi K /2 mK T`Q/+2bB; Qb /22Q`B b Q`; MBx +BQM ;BM Bk BQ M b
h?2Q@ [m2 /2b+`2p2 2b/i2bBm2KQQ`; MBx ä½Q2@Bz HHB M
+2@ [m2 KQ/2H +QH #Q` İä2b 2Fb? Q@/2 H B x2+BQM Bb BM/2T2
+ #2M/Q- TQ`i MiQ- miBHBx İ½QX

.2 +Q`/Q +Q kkye9- b Q`; MBx İä2b b½Q 2MiB/ /2b +QKT
T ` bmT2` ` p€`B b HBKBi İä2b /2 BMbi•M+B b BM/BpB/m Bb
7QbB+ b- i2KTQ` Bb- +Q;MBiBp b 2 BMbiBim+BQM BbX 1tBbi
/ b Q`; MBx İä2b 2 aJ + #2M/Q- TQ`i MiQ- miBHBx İ½Q /2 +Q
/2/2bBQM; MBx +BQM H?mK MQ+QKQ T`BM+QT BQ ch-k[y]w8

w K#QM2HHB- C2MMB Wyyv2Bq/B+/`Bn/2mK / b p Mi ;2Mb 2
mK T2`bT2+iBp Q`; MBx +BQM H û iQ`M ` Q T`QD2iQ /Q bBbi2
/2 ;2`2M+B ` /Q [m2 #bi` İä2b K Bb i` /B+BQM Bb T2`KBi2KX

* / ;2Mi2 iQ`M @b2 mK HQ+ H b2T ` /Q /2 +QMi`QH2- 2M
T T2H 2 b2` TH2M K2Mi2 `2bTQM b€p2H TQ` 2H2c BM+Q`TQ` M
+BQM HB/ /2 /2 [m2 M2+2bbBi T ` +mKT`B` Q b2m T T2HX Z
2bb2b TQMiQb 7 +BHBi/Kb BTQ Q T2Q K Q p2` mK b2T ` İ½Q K Bb
2Mi`2 b /BK2M2b B M2` @ ;2Mi2 2 B Mi2" @L;12G2 U C 1LLAL:ac
qPPG._A.:4kyvRX

1K KmBiQb + bQb- Qb aJ b½Q /2biBM /Qb TQB `2fQm +QM
 x ĩ½Q /Q KmM/Q `2 HX SQ` 2t2KTHQ- Qb aJ TQ/2K b2` /Qi /Qb T
 K2MiQ /Q ~mtQ /2 i` # H?Q 2K mK 2[mBT2 Qm T` Dm/ ` +QMİ`
 mK H2BH½Q M BMi2`M2iX L2bb2b + bQb- mK T`QD2iQ /2 aJ # b2
 /Bbi•M+B +QM+2Bim H 2Mi`2 Q bBbi2K /2 bQ7ir `2 2 Q bBbi2K /
 /2 bmTQ`i `X *QMb2[m2Mi2K2Mi2- BbiQ bBKTHB}w Q" P2@ 2MpQH
 L1GGAc C1LLAL:ac qPPGkyARX 1

kXe S /` ½Q /2 T` QD2iQ

IK T /` ½Q /2 T` QD/2iQB UM ĩViZQM bmb [m i` Q 2H2K2MiQb 2bb
 UC P>LaPL 2iRNM8

Ç P MQK2 /Q T /` ½Q, /2b+`2p2 Q T /` ½Q [m2 `2bQH p2 /2i2`KBM /
 7 +BHBi /Q+mK2Mi ĩ½Q 2 /Bb+mbb½Q bQ#`2 T /` ä2b T2HQ

Ç P T`Q#H2K , /2b+`2p2 [m M/Q THB+ ` Q T /` ½Qc

Ç bQHm ĩ½Q, /2b+`2p2 Qb 2H2K2MiQB, Nm2m+ QKT ĩä2iä Qb - `2bTQM
 b #BHB/ /2b 2 +QH #Q` ĩä2bc

Ç b +QMb2[m M+B b, Qb `2bmHi /Qb- p Mi ;2Mb 2 /2bp Mi ;2Mb

P +QM+2BiQ /2 T /` ä2b /2 T` QD2iQ `272`2@b2 `b /2b+`B ĩä2b
 + i€HQ;Q /2 T /` ä2b T` 2bK2MiUR/QMIXQ`K T /` ½Q /2 T` QD2iQ /2}M2 m
 2bi`mim` /2 T` QD2iQ +QKmK [m2 Q iQ`M2 mK T` QD2iQ Q`B2Mi /Q
 2bi`mim` û +QKTQbi TQ` BMbi•M+B b 2 +H bb2b +QK b2mb T Tü
 /2 `2bTQM b #BHB / -2bNMX

}K /2 2t2KTHB}+` mK T /` ½Q /2 T` QD2iQ- û T` 2b2Mi /Q
 `2bmKB/ - Q #b ĩ½Q i 6 +i2Q MB/Q TKK URNM8 QK H;mMb /Qb 2H2K2Mi
 Q`B;BM HK2Mi2 miBHBx /Qb T ` bm /2b+`B ĩ½QX

LQK2 /Q T /` ½Q, i` +i 6 XiQ`v

AMi2M ĩ½Q, p mK BMi2`7 +2 T ` +`B ĩ½Q /2 7 KQHB b /2 Q#D2
 /2T2M/2Mi2b 2Mi`2 bB- b2K 2bT2+B}+` bm b +H bb2b +QM+`2

1bi`mimBHmbi` / M jxB;m`

6B;m` j 1bi`mim` /Q T /`½Q /2 T`QD2iQ

*QMb2[m MBb +H bb2b +QM+`2i bc 7 +BHBi i`Q+ /2 7
KQp2 +QMbBbi M+B 2Mi`2 Qb T`Q/miQbc /B}+mHi BKTH
T`Q/miQbX

AKTH2K2Mi i`2i,2 i:TB+Q- b½Q T`2b2Mi / b 2 /2b+`Bi b iû+M
Q T /`½Q- # bB+ K2Mi2, a7EM; B2+QM i`Q /Qb T`Q/miQb 2 /2
/2 7€#`B+ b 2ti2MbQp2BbX

1t2KTHQ /2 +i/2i,2 i:TB+Q- b½Q Bmb2`B/Qb i`2+?Qb /2 +i/B;
2tTHB+ i½Q /2 +QKQ BKTH2K2Mi `Q T /`½Q- TQ`*2iK
+`2i26 +iQ`viB`#bi` +i6 +2Q/2KQ/Q b2K2H? Mi2- +QKQ Bmb
S`Q/m+i`iB` /2 mK #hibb+2S`Qm iB-HBx M/Q b iû+MB+ b b m

IbQb +QM?2+BBQM +`B i½Q /2 Q#D2iQb /2 BMi2`7 +2 2 mbQ
TQ`i #BHB/ /2 2MiQ BMBQXi K b

S /`ä2b`2H +BQM#bQ`b,+i6 +TQ/2 b2` BKTH2K2Mi /Q miiBHBx M
J2i?QrS`QiQXvPK2*QM+`2i26 ;2iQHVK2Mi2aB M KX2iQM

L2bi T2b[mBb - /2 KQ/Q b2K2H? Mi2- Q + i€HQ;Q /2 T /
#mb+ `2mMB` `[mBi2im` b Q`; MBx +BQM Bb 2t+HmbBp K2M
`2miBHBx i½QX

kXd * i€HQ;Q /2 T /` ä2b

IK + i€HQ;Q /2 T /` ä2b û mK + QMDmMiQ /2 T /` ä2b `2H +BQM
 K2Mi2 Qm BM7Q`K HK2Mi2 `2H +BQM /QbX LQ + i€HQ;Q- Qb T /` ä
 ;Q`B b #` M;2Mi2b TQ/2M/Q BM+HmB` `272` M+~~SB 6 1H RL~~ / b 2Mi
~~RNM~~ P + i€HQ;Q /2 T /` ä2b TQ/2 BM+HmB` T`2b2Mi $\frac{1}{2}$ Q / b 2
 /Q T /` $\frac{1}{2}$ Q- K b- MQ`K HK2Mi2- M $\frac{1}{2}$ Q T`2b2Mi H;Q HûK / 2bi`mi
 7 +BHK2Mi2 B/2M ~~SB 4 6 P RB MW~~

2t2KTHQ ~~K2 URNM 8~~7Q` K Q`; MBx /Qb kj T /` ä2b /2 T`QD2iQ
 Q#D2iQb 2K mK + i€HQ;Q- +Q ~~RQ 1 B H m b i i~~€HQ;Q/2b+`2p2 #Q bbQ
 /2 bQ7ir `2 /2 mbQ ;2Mû`B+Q- Qm b2D - T /` ä2b [m2 BM/2T2M/2K
 Pb miQ`2b miBHBx ` K/QBb +`Biû`BQb T ` +H bbB}+ ` Qb T /` ä2
 T`QTibBiQX bbBK- T-/2 @b2 +QKmMB+ ` 2 2tB#B` b`2H $\frac{1}{2}$ ä2b 2M

h #2H R *H bbB}+ $\frac{1}{2}$ Q /Qb T /` ä2b /2: ~~TK Q UR NM X~~ 6X 6QMi2,

S`QTibBiQ		
*`B +BQM	H 1bi`mim` H	*QKTQ`i K2Mi H
1b+QTQH bb2 6 +iQ`v J2i?Q/ / Ti2`		AMi2`T`2i2` h2KTH i2 J2i?Q/
P#D2iQ"mBH/2` S`QiQiv.22-Q`iQ` aBM;H2iQM	/ Ti2` " `B/;2 #bi` +i 6 +iQ`v *QKTQbBi2 6 + /2 6Hvr2v;?i S`Qtv	*? BM Q7 _2bTQM b #BH *QKK M/ Ai2` iQ` J2/B iQ` J2K2MiQ P#b2`p2` ai i2 ai` i2;v oBbBiQ`

SQ`i MiQ- 2K `2bmKQ- T ` + ` +i2`Bx ` mK + i€HQ;Q /2 T /` ä

Ç * i2;Q`B b /2 T /` ä2bc

Ç *`Biû`BQb /2 +H bbB}+ $\frac{1}{2}$ Q /Q T /` $\frac{1}{2}$ Q 2K + i2;Q`B bc

Ç _2H +BQM K2MiQbf`272` M+B b +`mx / b 2Mi`2 T /` ä2bX

kX3 *QMbB/2` $\frac{1}{2}$ ä2b T `+B Bb

*QM+2BiQb`2H +BQM /Qb " 1M;2M? `B /2 aQ7ir `2 +QKQ T /`
 /2 T /` ä2b- `[mBi2im` /2 bQ7ir `2 2 T /` $\frac{1}{2}$ Q `[mBi2im` H b $\frac{1}{2}$ Q #Q`

b2`2K +QM+2BiQb 7`2[m2Mi2K2Mi2 miBHBx /Qb M2bi2 i` # H?
+2`+ /2 aJ 7Q` K #Q`/ /Qb /2 KQ/Q b2`pB`2K /2 2K# b K2M
+ TQimHQbX . / b b TQbbQp2Bb /2}MBÄä2b /2 ;2Mi2b 2 aJ - QT
/B/€iB+ b 2 +QM+Q`/ Mi2b 2Mi`2 bBc #2K +QKQ- 2b+QH? /Qb
/2m@b2 T2H Hi TQTmH `B/ /2 /2 b2mb i` # H?QbX

j a m T Q ` i 2 i 2 + M Q H ! ; B + Q

1 b i 2 + T Q i m H Q i 2 K Q Q # D 2 i B p Q / 2 T ` 2 b 2 M i ` b T ` B M + B
m i B H B x / b M Q / 2 b 2 M p Q H p B K 2 M i Q / K Q M Q ; ` } 2 M 2 t 2 + m i 1 / 2
2 b i € / B p B / B / Q 2 K / m b b 2 i ä 2 b j X B T M z B z T M B b , b z 2 i 1 / 2 Q 2 M i b ` 2 H +
a J 2 a 2 i j X Q T ` 2 b 2 M i b 7 2 ` ` K 2 M i b / 2 T Q B Q X

j X R a B b i 2 K b J m H i B ; 2 M i 2 b

Z m M i Q Q / 2 b 2 M p Q H p B K 2 M i Q / 2 a J - 7 Q B / Q i / T H i 7 Q
b 2 ; m B ` X

j X R X R S H i 7 Q ` K C . 1

P C . 1 C p ; 2 M i . 1 p 2 H Q T K 2 M V G n K r Q 2 F ` K 2 M i / 2 b 2 M p Q
T 2 H h 2 H 2 + Q K A i € H B 2 K T ` + 2 ` B + Q K I M B p 2 ` b B / / 2 / 2 S ` K
T ` Q D Q T Q M b Q Q K + H B + 2 M i G z b Q ` U : 2 M 2 ` H S m # C B . 1 - G y P V X
h ` i @ b 2 / 2 m K T H i 7 Q ` K / 2 b Q 7 i r ` 2 [m 2 7 Q ` M 2 + 2 7 m M + B Q M
K B // H 2 r C 2 . 1 - k y R / X p 2 ` b 1 / 2 Q m i B H B x / u 9 X 8 X y X

P C . 1 b B K T H B } + # b i ` i 1 / 2 Q / 2 ; 2 M i 2 b / 2 b Q 7 i r ` 2 2 K + Q I
/ B b i ` B # m Q / b T Q ` K 2 B Q / B K T H 2 K 2 M i i 1 / 2 Q / 2 ; ` M / 2 " T G i @ / b 2
G A 6 1 J A L 1 c * A _ 1 c : _ 1 1 L k y P P T € ; X j y V X P C . 1 + Q M i ` B # m B m + C
H ` B x i 1 / 2 Q / b 2 b T 2 + B } + i ä 2 b 6 A S Q 7 Q ` M 2 + 2 ` m K + Q M D m M i
/ 2 b Q 7 i r ` 2 [m 2 Q + m H i K B K T H 2 K 2 M i i 1 / 2 Q 2 b 2 b T 2 + B } + i ä 2 b
T Q / 2 @ b 2 B K T H 2 K 2 M i ` / 2 + Q ` / Q + Q K b 2 b T 2 + B } + i ä 2 b - b 2 K
U 1 G G A 6 1 J A L 1 c * A _ 1 c : _ 1 1 L k y P P T € ; X j y V X

P m i ` Q K u ` B i Q / T H i 7 Q ` K C . 1 u [m 2 2 H B K T H 2 K 2 M i i
/ H B M ; m ; 2 K C p 2 - T Q ` i M i Q - T ` Q p m K m K S A b B K T H 2 b 2
/ 2 m K H B M ; m ; 2 K Q ` B 2 M i / Q # D 2 i Q b " K T G K 6 K 2 M i 2 L 1 Q M ? 2 + B d
: _ 1 1 L q P P . - k y y - d T € ; X j y V X

1 K b m K - Q C . 1 B M A + H m y B W

Ç I K K # B 2 M i 2 2 K i 2 K T Q / 2 2 t 2 + m i 1 / 2 Q T ` Q b ; 2 M i 2 b C . 1 - Q M
2 K m K / 2 i 2 ` K B Q b M Q 2 b [m 2 m K Q m K B b ; 2 M i 2 b T Q b b K b 2 ` 2
? Q b i

R ? i i T , f f D / 2 X i B H # X + Q K

Ç IK #B#HBQi2+ /2 +H bb2b T ` BKTH2K2Mi ` ;2Mi2bc

Ç IK +QMDmMiQ /2 72`` K2Mi b ;`€}+ b [m2 T2`KBi2K /KBMBbi`
pB/ /2 /2 ;2Mi2b 2K 2t2+mİ½QX

jXRXRXR `[mBi2im` / TH i 7Q`K C .1

* / BMbi•M+B 2K 2t2+mİ½Q /Q K#B2Mi2 CM.i1B0-2Q k / /2
+QMi BM2`@- TQBb TQ/2 +QMi2` p€`BQb ;2Mi2bX P +QMDmMiQ /
/2SH i7Q1K +QMi BM2` b2 /B72`J B0b+QMXBBIQ`/2p2 2bi ` b2KT`2
iBpQ 2 b2` Q T`BK2B`Q BMB+B `@b2 M TH i 7Q`K - /2 KQ/Q [m2
`2;Bbi` `2K@b2 M2H2 bbBKA[m2 yMB+B K@b2 U

* bQ Qmi`QM +QMib BM2BMB+B /Q M `2/2- b2`€ /2 mK TH i 7Q
T ` [m H MQpQb +QMi BM2`2b MQ`K Bb TQ/2K `2;Bbi` `@b2X S
T` +Bi /Qb- \$B;2b2Mi mK +2M€`BQ/2 2t2KTHQ +QKTQbiQ TQ` /
C .1 7Q`K / TQ` i` b 2 mK +QMi BM2`2bA_2by2NiBp K2Mi2 U

6B;m` 9 *QMi BM2`b 2 TH i BQk yW 6QMi2,

Pb ;2Mi2b C .1 b½Q B/2MiB}+ /Qb +QK MQK2b 2t+HmbBpQb ;
Q MQK2 /Q Qmi`Q- 2H2b TQ/2K b2 +QKmMB+ ` BM/2T2M/2Mi2K2M
+QKQ- TQ` 2t2KTHQ9, M2 MB2m` k 2 j MQ K2bKQ +QMi BM2`- ;2M

k 2K /B72`2Mi2b +QMi BM2`2b K b M K2bK TH i 7Q`K 2 ;2M
TH i 7Q`*K Ab_ Uk y yWX

HûK / + T +B/ /2 /2 +2Bi `` `2;Bbi`Qb /2 Q nBiMQ+Q+Q MB MB2M
/B72`2 /Qb +QMi BM2`2b MQ`K Bb TQ` TQbbmB` /QBb ;2Mi2b
iB+ K2Mi2, Q;2MiW M ;2K2MiV a 2bQ2.6BU2+iQ`v 6 +B*H B_i 1Q`
kyyWX P Ja 2t2`+2 +QMi`QH2 /2 bmT2`pBb½Q bQ#`2 Q +2bbQ
MQK2 Ĩ½Q [m2; ` Mi2 [m2 + / ;2Mi2 M TH i 7Q`K `2;Bbi`2@
2 p€HB/Q- Q A. U ;2Mi` 1G2MiB1;2AV 1U 2ky yWX HûK /BbbQ- Q Ja
+ T x +QMi`QH ` Q +B+HQ /2 pB/ /Qb ;2Mi2bA 2k kyQWX BM2`2b

SQ`bm p2x- Q ;2Mi2 .6 7Q`M 2 2 H hCrb 2; Q Ĩ Q €; 2M b K `2
@ i` pûb /Q [m H m K ;2Mi2 TQ/2 2M+QMi` ` Qmi`Qb ;2Mi2b [r
2H2 T`2+Bb T ` H+ MĨ `*b 2 m 1k y WX 2iBpQb U

jXk 62`` K2Mi b /2 TQBQ

b 72`` K2Mi b b2;mB` 7Q` K miBHBx / b T ` mtBHB ` M
TH2K2Mi Ĩ½Q- #2K +QKQ M /Q+mK2Mi Ĩ½Q bbQ+B / X "mb+Q
/[mB`B/Qb MQ /2+Q``2` /Q +m`bQ /2 1M;2M? `B /2 aQ7ir `2 T
2K i2+MQHQ;B - [m MiQ 2K T`€iB+ b /2 /2b2MpQHpBK2MiQ /2 M

jXkXR "QMBi "SJ

P "QMBi *S JmK 72`` K2MiM @ fQ`m`; 222M+B K2MiQ /2 T`Q-
/2 M2; i+ BFLAU a P 6ky Ry 1H T2`KBi2 KQ/2H ` - +QM};m` ` 2 2t2
i` # H?Q /2 M2; i+BQb miBHBx M / Q b BMQ Ĩ b ½ Q Q S 2 b WJ M ;2K2M
iB QM LQ +QMi2tiQ /2bi KQM; ` } - b2`€ miBHBx / T ` KQ/2H
" K2iQ/QHQ;B U V XT Q p 2 H Q 2 Q miBHBx / û dXjX

jXkXk h`2HHQ

72`` K2MiQ f` 2 H H Q # BHBi /2 KQ/Q 7€+BH- ;` imBiQ 2 ~2t
/2 T`QD 2 i Q G R y R v P h`2HHQ mtBHB MQ; M?Q /2 T`Q/miBpB
T2b ;` M/2b [m MiQ /2 7Q`K BM/BpB/m HX " b 2 B @ ib M I 2 Q n b B @
HBx /Q MQ /2b2MpQHpBK2MiQ +QK a+`mK- K2iQ/Q H C; B P miBH
ky R v P h`2HHQ 7QB miBHBx /Q T ` Q`; MBx ` b i `27 b 2Mp
/2b2MpQHpBK2MiQ 2 2b+`Bi /2bi2 i` # H?QX

k ?iiT,ffrrrX#QMBi bQ7iX+QK
j ?iiTb,ffi`2HHQX+QK
9 ?iiTb,ff#`X iH bbB MX+QKf ;BH2fF M# M

jXkXj .2#B M

P .2#B⁸ MmK bBbi2K QT2` +G Q1M @ H B p2` 1/2 QHpB/Q T2HQ S` QD
.2#B M1 UA L-ky RvX Pb bBbi2K b /2b2MpQHpb/Qb T2HQ T` QD2iQ mi
F2` M2H QbM Qa tM2H 6` X 2 P" a2#B M 3 C2bbB2- H B M2M +HBG/B+2 M H 2
Sm# HBS-GV- û miBHBx /Q M2bi KQMq;` } T ` Q /2b2MpQHpbK2M

jXkX9 1+HBTb2 A.1

P 1+HBT^e m2K A.1 miBHBx / T` BM+BT HK2Mi2 T ` Q /2b2MpQH
ïä2b C p* UASa1 6PIL. hAkRvX 1bi€ HB+2M+B /Q Q1M @ b B + 2 Mb
1+HBTb2 Sm# H B p 2` B 1/2 Q 9 X eXj û miBHBx / M2bi2 i` # H?QX

jXkX8 :Bi

:Bi^d û mK 72`` K2Mi T ` +QMi`QH2 /2 p2`b 1/2 Q /Bbi`B#mQ/ L
:2M2` H Sm#HB+ GB+2M m2 p 2` B 2M k X ym` +2#2M27Q+BQb +QKQ p
+B/ /2- ; ` MiB / B Mi2;`B/ /2 /Qb / /Qb 2 bmTQ`i2 T ` ~mtQb /2 i
2 M 1/2 Q @ HB>M2P L2baU _ l"ky R 9t€;X jRVX SQ` 2bi b ` xä2b Q :Bi p2`b
b2`€ miBHBx /Q T ` p2`bBQM K2MiQ /Q +! /B;Q 7QMi2 2 T ` T ` i

jXkXe :Bi?m#

:Bi?³ m# mK bBb Q1KH/BM2Q bT2/ ;2K /2 +! /B;Q @7QMi2 miBHBx M
KBi2 M p2; HB#BHB/ /2 T2Hqr Bif-BB M @ 7` Q M 1/2 Q -+TQb b B p2` b b 72``
i b 2 ;2`2M+B K2M i r Q 2/2 > l" - ky RvX

P :Bi>m# b2`€ miBHBx /Q T ` ;2`2M+B ` /B72`2Mi2b HBM? b
#` M+@ b2 T`QKQp2` ` bi`2 #BHB/ /2 /Qb `2[mBbB B b @ 2]m2 b2` 1/2 C
b2m +QMi`QH2 i` pûb/Q KûiQ/Q F M# M- i K: A h k l" l2y RvX Mi2 MQ :Bi

jXkXd G h2s

G h2s^N û mK bBbi2K iBTQ;`€}+Q miBHBx /Q # b2 /Q M HBM;m
TQ` /Bp2`b b mMBp2`bB/ /2b- BM+HmBM/Q IM"X am b 7mM+BQM
/2 /Q+mK2Mi ï 1/2 Q iû+MB+ 2 +B2MiQ}+ X G h2s 2bi€ /BbTQMqp2H
HB+2M+B /Q b Q # Q D 2 h 2 S sm# HB G S B G 2 Mb p2` 6 1/2 Q Rky RvX P
G h2s 7QB 2b+QH?B/Q T ` 2bi KQMq;` } TQ` bBKTHB}+ ` 7Q`K

⁸ ?iiTb,ffrrrX/2#B MXQ`;f/Bbi`B#
^e ?iiTb,ff2+HBTb2XQ`;
^d ?iiTb,ff;Bi@b+KX+QK
³ ?iiTb,ff;Bi?m#X+QK
^N ?iiTb,ffrrrXH i2t@T`QD2+iXQ`;

jXkX3 S T22`B

S T22^{Ry}B mK 2/BiQ HB M2G h2sX P mbQ û ;` imBiQ T ` K BQ
 7mM+BQM HB/ /2bX h` i @b2/2 mK bQ7ir `2 T`QT`B2i€`BQXS
 bQK2Mi22#K#`QXbSQbbmB Q 2/BiQ` /2 +! /B;Q 7QMi2 2 Q +QKTBI
 /Q+mK2Mi İ½QX Pmi`Q /B72`2M+B H BKTQ`i Mi2 / 72`` K2M
 :Bi>m#- T2`KBiBM/Q +QMi`QH2 /2 p2`b½Q 2 ^{BSM+`_QMyRe}İ½Q 2
 hQ/ /Q+mK2Mi İ½Q / KQM;` } û`2 HBx / miBHBx M/Q Q S

jXkX3XR S `bB7 H

+QM/mİ½Q / _a b2`€ TQB / T2H ^{R7}2`mDK2 MQ MS 2`tb B 7û h
 i /Q T ` `2 HBx İ½Q /2 `2pBbä2b bBbi2K€iB+ b /2 HBi2` im` M
 aQ7ir ^{S2_Ua A 6 - Gy Re}X S `b ^{BMH2}BM2imBiQX

jXj *QMbB/2` İä2b T `+B Bb

1bi2 + TQimHQ #mb+Qm T`2b2Mi ` b 72`` K2Mi b 2 i2+MQ
 Q /2b2MpQHpbK2MiQ /2bi T2b[mBb - /2b/2 /Q+mK2Mi İ½Q /C
 K2MiQ 2 T2b[mBb X SQ/2 @b2 Q#b2`p `[m2 7Q` KQt2HM2@ BQM`#
 [m MiQ ;` imBi bX

Ry ?iiTb,ffrrrXT T22`B X+QK
 RR ?iiTb,ffT `bB7X H

9 J2iQ/QHQ;B

$1b^2 + TQimHQ i2K Q Q\#D2iBpQ /2 \quad T`2b2Mi` \quad K2iQ/QH$
 $[m2 b2` \frac{1}{2}Q b2; mB/Qb \quad]K /2 \quad iBM; B` Qb Q\#D2iBpQ b mi2 \quad Q\#B$
 $K2iQ/QHQ; B b /2 T2b[mBb + B2MiQ} + T \quad 9`X kb2K 2b2; \bar{B}2/b2 Mi b2$
 $b 2b+QH? b K2iQ/QH!; B+ b /Qi / b TQ` \quad 2\% p2 29 \# 8/21 QH? K b2 \ddot{a}$
 $Qb \sim mtQb /2 +QM/m\ddot{I} \frac{1}{2}Q /Q h^{**} +QKQ mK iQ/Q- \quad `2pBb \frac{1}{2}Q bBbi$
 $`2bT2+iBp K2Mi2X$

9XR J2iQ/QHQ;B b /2 T2b[mBb

$P +QM?2+BK2MiQ +B2MiQ}+Q /Bp2` ; 2 /Qb /2K Bb iBTQb /2$
 $+2bbB/ /2 /2 /Qi ` 7mM/ K2Mi \ddot{I} \frac{1}{2}Q 2 K2iQ/QHQ; B b \quad b2` 2K b2;$
 $2KóBM7Q`K \ddot{I} \ddot{a}2b +H bbB}+ / b- bm\#K2iB/ b \quad " p2` B}+ \ddot{I} \frac{1}{2}Q- [m2$
 $p2Bb \quad `2bT2BiQ /Q Q\#D2iQ Qm \quad 2 p 2 M L Q \quad 2 K [m2 b k \frac{1}{2} Q \ddot{I} T \in ; X$
 $kkVX Pm b2D - \hat{u} BKT` 2b+BM/Qp2H /2i2` KBM ` Q Kúiq/Q +B2Mi$
 $+QM?2+B \quad 2 Mi Q \quad P o c \quad 6 _ 1 A \text{-} k y R j T \in ; X \quad k 9 V X$

$P /2b2MpQHpBK2MiQ /Q Kúiq/Q +B2MiQ}+Q K2/B Mi2 bm$
 $K \in iB+ TQbbB\#BHBi \quad T2: b \text{-} k y y 3 T \in ; X \quad P 2 Q \# Q 2 + B p Q 7 m M / K 2 M i H /$
 $\hat{u} /2b+Q\#`B` `2bTQbi b T ` \quad T`Q\#H2K b K2/B Mi2 Q 2KT`2; Q /2$
 $U A G k y y \text{-} 3 T \in ; X \quad k e V X$

$Zm MiQ Qb Q\#D2iBpQb- \hat{u} TQbbQp2H +H bbB}+ : A G T2b[r$
 $k y y \text{-} k T \in ; X \quad 9 R V , U B V 2 t T H Q ` i l ` B - U B B V / 2 b + ` B k B \bar{p} ` 2 b 2 M B B Q b 2 t$
 $Q\#D2iBpQb / b K2bK bX$

$*QK`2H \ddot{I} \frac{1}{2}Q \quad " \quad \#Q` / ; 2K- \quad T2b[mBb \quad TQ/2 b2` +H bbB}+ /$
 $iBi iBp \quad 2 UBBV T2b[mBb \quad [m HBi iBp X \quad T2b[mBb \quad [m MiBi iB$
 $[m MiB}+ \in p2Hc QTBM B \ddot{a}2b 2 BM7Q`K \ddot{I} \ddot{a}2b TQ/2K b2` i` /mxB/$
 $+H bbB}+ / b 2 \quad M HBb / bX 1bi2 iBTQ /2 T2b[mBb \quad 2tB; 2 Q m$
 $2bi iQbi \quad S + P b \quad U P o c \quad 6 _ 1 A \text{-} k y R j X \quad T2b[mBb \quad [m HBi iBp \quad B M p 2 b i$
 $/BM \cdot KB+ \quad 2Mi` 2 Q KmM/Q` 2 H 2 Q b m D 2 Bi Q - BbiQ \hat{u} - mK pQM+m$
 $2 \quad bm\#D2iBpB/ /2 /Q Q\#D2iQ /2 2bim/Q [m2 M \frac{1}{2}Q TQ/2 b2` i` /r$

$a2; m M S Q Q / M Q p 2 \quad 6 k y B j - b / Q T Q M i Q / 2 p B b i / M i m ` 2 x -$
 $TQ/2 b2` +H bbB}+ / +QKQ, UB V \# \in b B + \quad 2 UBBV \quad T H B + / X S$
 $`2bmHi ` 2K MQpQb +QM?2+BK2MiQb [m2 b2D K 9i2Bb T ` \quad +$
 $T` \hat{u} p B / 2 mK \quad T H B + \ddot{I} \frac{1}{2}Q T` \in iB + X \quad T2b[mBb \quad T H B + / \# m b +$
 $+QK \quad T H B + \ddot{I} \frac{1}{2}Q 2K b Q H m \ddot{I} \ddot{a}2b T ` \quad T`Q\#H2K b 2bT2+Q}+QbX$

h #2H k *H bbB}+ ĩ½Q / T2b[mBb +B2MiQ}+ [m MiQ Qb

S2b[mBb 1tTHQ` i `B	S2b[mBb .2b+`BiBp	S2b[mBb 1tTHB+ iBp
------------------------	----------------------	-----------------------

P#D2iBp Q`QTB+B `K BQ2;Bbi` ` 2 óA/2MiB}+ ` Qb
 7 KBHB `B/ /2/2K 2p2` Qb 7 iQbQ`2b [m2
 Q T`Q#H2K - +Q#Q`p /Qb b2K2`KBM K Qm [m2
 T`QTibBiQ /2Bmi2`72` M+BQ/Mi`B#m2K T`
 iQ`M€@HQ K B2b[mBb /Q`Q+Q`` M+B /Qb
 2tTHQ+BiQ Qb P. LPoc 72M-K2MAQô
 +QMbi`mB` ?B ĩ½Q 2bbyRj kyykT€;X 9kVX
 UA Gkyy-kT€;X T€;X 8kVX
 9RVX

9Xk 1b+QH? b K2iQ/QH!;B+ b

h #2H T`2b2Mi - #`2p2K2Mi2- b 2b+QH? b K2iQ/QH!;B+ b /
 i` # H?QX P iBTQ /2 T2b[mBb /Qi /Q M2bi2 i` # H?Q- [m MiQ QI
 û Q 2tTHQ` i|`BQX 1K i2`KQb /2 #Q` / ;2K- T2b[mBb [m HBi iB
 2bi2 i` # H?QX Zm MiQ " M im`2x - T2b[mBb +H bbB}+ @b2 +
 ;2` ` +QM?2+BK2MiQb b2`2K miBHBx /Qb M bQHm ĩ½Q /2 T`Q#
 Qb T`Q+2/BK2MiQb- BMB+B HK2Mi2- QTiqm@b2 TQ` T2b[mBb #
 T2b[mBb /Q` +QM?2ĭ Qb 2bim/Qb D€` 2PLBx *-QpykQ#;X PRVXmMiC

h #2H j J2iQ/QHQ;B /2 T2b[mBb

Zm MiQ Qb Q#D2iBpQb	Zm MiQ " #Q` / ;2K	Zm MiQ " M im`2x	S`Q+2/BK2MiQb
------------------------	--------------------	------------------	---------------

S2b[mBb 2tTHQ` i `B	S2b[mBb [m HBi iBp	S2b[mBb THB+ \$2b[mBb #B#HBQ;`€}+ - _2pBb½Q bBbi2K€iB`mK
------------------------	-----------------------	--

a2`€ miBHBx / `2pBb½Q bBbi2K€iB+ / HBi2` im` /2 KQ/Q
 `[mBi2im` b T` aJ X S` TQB ` Q /2b2MpQHpbK2MiQ- b2`€ 72
 K2iQ/QHQ;BXK.B Mi2 /Q 2tTQbiQ- T` TH2M +QM/m ĩ½Q /2bb2 i` #
 M? /Qb [m i`Q ~mtQb T`BM+BT Bb, UBV ~mtQ /2 iBpB/ /2b T`
 mKiQ/Q U 2X ĩ½Q BBV ~mtQ /2 iBpB/ /2b /2`2p BbV9QubBBB2K-€iBQ U
 T` +QM/m ĩ½Q / b iBpB/ /2b bbQ+B / b Q /2b2MpQHpbK2MiQ 2

T /` ä2b `[mBi2im` 98B/X2a2BpQ ~mtQ /2 iBpB/ /2b T ` M€HBb
Ua2iVQX * #2 `2bb Hi `[m2 Q ~mtQ /2 iBpB/ /2b T ` +QM/mi1/2
Qb /2K Bb ~mtQb- +QM7Q`K2 /2i H? /Q M T`itBK b2i1/2QX

9Xj 6HmtQ /2 iBpB/ /2b T ` +QM/mi1/2Q /Q

+QM/mi1/2Q /Q h** 2bi€ KQ/2H / 2K /m b 2i T b, 2i T `2
U6B;mV 2 2i T `272`2Mi2 Q h*€hX U6B;m`

6B;m` 8 6HmtQ /2 iBpB/ /2b T ` Q /2b2MpQHpbK2MiC

b iBpB/ /2b /2b+`Bi b MQ ~mtQ T ` +QM/8mi1/2Q/Q b+*rBR U
`2bmKB/ K2Mi2- b2;mB`,

Ç .2}MB` i2K MpQH p2 B/2MiB}+ i1/2Q / €`2 /2 T2b[mBb - /Bb
i2K b /2 `2H2p•M+B c

Ç G2p Mi ` `272`2M+B Hi2!QB 2Q2B MB+B H,i2i`B+Q [m2 7mM/
TQbi 2 +QMbQHB/ Qi2K û H2p Mi /Q M2bi iBpB/ /2c

Ç 1H #Q` ` T`QT QK2Mi ` T2b[mBb /2 KQ/Q 2bi #2H2+2`
D2iBpQb- DmbiB}+ iBp - [m2biä2b /2 T2b[mBb - K2iQ/QHQ
K Bb 2H2K2Mi `2bX h Bb bT2+iQb TQ/2K bQ7`2` KQ/B}+ iä

Ç 1bi #2H2+2` K2iQ/QHQ;B /2TK2K [bB b7, KBHB `B/ /2 /Q T2
bQ#`2 Qi2K - K2iQ/QHQ;B /2 T2b[mBb TQ/2 b2` +QMbQ

Ç 1bi #2H2+2` bmTQ`i2 i2i+M QH2B+ B M/B+ i1/2Q / b 72` ` K2M
miBHBx / b- b [m Bb TQB K Q /2b2MpQHpbK2MiQ / T`QT

Ç _2 HBx ` T2b[mBb #B#2H2pQ;Hf2+ T2b[mBb /2 i` # H?Qb +
7Q`M2i K 2K# b K2MiQ T ` Qb Q#D2iBpQb T`û@2bi #2H2+
T ` `2pBb1/2Q bBbi2i98B+ /Qa2i1/2Q` 2bi iBpB/ /2c

Ç AKTH2K2Mi ` T`Qp /2 +BKM+H2BK2Mi İ½Q /2 T`Qp /2 +QM+2BiQ
 b2D K B/2MiB}+ /Qb `Bb+Qb TQi2M+B Bb [m2 TQbb K B Mi2`72
 /`ä2bX P ~mtQ +2Mi` /Q 2K iBpB/ /2b /2 /2b2MpQHpbK2MiQ
 /Qi /Q M2bb2 i` # H?Q- 2M+QMi` @X8/c2b+`BiQ M Ua2İ½Q

Ç _2}M ` KQMQ;`+QK # b2 MQb `2bmHi /Qb Q#iB/Qb iû Q KQK2I
 ;m /Q #2K +QKQ /Q+mK2Mi /Q b2 Qb Q#D2iBpQb 2bi #2H2+B/
 h**nR 7Q` K iBM;B/QbX AbbQ T2`KBiBm`2}M ` T `i2 2b+`Bi

Ç T`2b2Mi ` h**nRQMbBbi2 M T`2b2Mi İ½Q /Q h**nR ` # M+ 2t

b iBpB/ /2b /2b+`Bi b MQ ~mtQ T ` +QM/mİ½Q/Qb+`rBi U6B;
 #`2p2K2Mi2- b2;mB`X

6B;m` e 6HmtQ /2 iBpB/ /2b T ` Q /2b2MpQHpbK2MiQ /Q

Ç 172im ` +Q`2İ/21m, İ½Q / KQMQ;` } "b bm;2biä2b 2 +`QiB+
 2t KBM /Q` c

Ç .2b2MpQHpb2` T /`ä2b `[mBK2ip2`x Bm,2 Qb T /`ä2b `[mBi2im`
 7Q` K B/2MiB}+ /Qb- 2bb iBpB/ /2 +QKT`22M/2 KQ/2H ;2K-
 +QKQ + i HQ; İ½Q /2bb2b T /`ä2bX o H2`2bb Hi `[m2 T`Qp
 T2`KBiBm +QM};m` ` Q K#B2Mi2 /2 /2b2MpQHpbK2MiQ #2K+
 `Bb+Qb 2 2bi #2H2+2` + KBM?Qb b2;m`Qb T ` +QM/mİ½Q /2b

Ç M HBb ` `2bm @GA, L GA X P ~mtQ /2 iBpB/ /2b T ` M€HBb2 /2 `2bmH\VQb /Qa2iQ` 2bi iBpB/ /2c

Ç _2}M ` KQMQ;`QK, # b2 MQb `2bmHi /Qb Q#iB/Qb Q }M H /Q
 p2`B;m /Q #2K +QKQ /Q+mK2Mi /Q b2 Qb Q#D2iBpQb 2bi #2H2
 MQ h** +QKQ mK iQ/Q 7Q` K iBM;B/QbX AbbQ T2`KBiB`€ `2}M
 KQMQ;` } c

Ç T`2b2Mi ` h**nR,`2b2Mi İ½Q /Q h**nk ` # M+ 2t KBM /Q` c

Ç 172im ` +Q`2İä2b TMD Bbm B +QKQ BMimBiQ `2 HBx ` b +Q`2İ
 K2MiQb TQMi /Qb T2H # M+ Tib T`2b2Mi İ½Q /Q h**nkX

9X9 _2pBb½Q bBbi2K€iB+

K BQ`B / b T2b[mBb b +QK2İ +QK mK `2pBb½Q / HBi
 `2pBb½Q /2 HBi2` im` TQbbmB [E Qm* Qlp](#) [H Qy y0B 2Mi Q2p B W½ Q](#)
 aBbi2K€iB+ U_aV TQ/2 b2` /Qi / M2bi2 + bQX IK _a- û mK k
 HB `2 B Mi2`T`2i` iQ/ b b T2b[mBb b /BbTQM Qp2Bb 2- Q K2b
 /2i2`KBM /[QE7Q+Q1U > -jyy0X](#)

_a bB Mi2iBx i` # H?Qb 2tBbi2Mi2b /2 +Q`/Q +QK mK 2
 /2}MB/ X 2bi` iû;B /2 #mb+ /2p2 T2`K BiB` [m2 B Mi2;`B/ /2 /
 .2Mi`2 b` xä2b T ` `2 HBx ` mK `2pBb½Q [B Bi2 K Mi B A9](#) / HB
 /2bi + ,

Ç _2bmKB` 2pB/ M+B 2tBbi2Mi2 bQ#`2 H;mK i!TB+Q 2K T `

Ç A/2MiB}+ ` 2p2Mim Bb H +mM b M T2b[mBb im H- }K /
 BMp2biB; İ½Qc

Ç 6Q`M2+27`mK2r [Q 卐](#) +F;`QmM/Qmi` b T2b[mBb bX

+QM/mİ½Q /Q T`Q+2bbQ /2 `2pBb½Q bBbi2K€iB+ TQ/2
 #Q`/ ;2K 2K i` b 7 b2b +QKQ T`2b [Q Mi T Q B M2 B B; m`b2 / T2b\[m](#)
 +QK2İ T `iB` /2 +QM+2BiQb- [m2 /2 7Q`K 2tTHQ+Bi 2 7Q`K H
 2K [m2bi½QX a½Q /2}MB/Qb Qb T`Q+2/BK2MiQb [m2 T2b[mBb
 û`2 HBx / M€HBb2 /Qb 2bim/Qb [m2 TQ/2K +QMi2` b BM7C
 i2K 2bT2+Q}+Q / BMp2biB; [A İ½Q X y y0X](#)

6B;m` d #Q`/ ;2K /2 `2pBb½Q bBbi2K€iB+ 2K i` [A F G b @](#) bX
 *>[ALA 2ikHy8](#)

b2;mM/ 7 b2 +QK2İ T `iB` /2bi2b 2bim/Qb +QH2i /Qb
 HBx / /BbiBMİ½Q /2 [m Bb 2bim/Qb b½Q `2H2p Mi2b 2 B`2
 BMp2biB; İ½QX a½Q 2t KBM /Qb 2K b2mb +QMi29/Qb- +QKT `
 T /Qb 2K bm b T `i2bX P#i K@b2 bbBK Qb `2bmHi /Qb- [m2 `2
 mK MQpQ iBTQ /[2AP`Q* > A U A -2iy y0X](#)

i2`+2B` 7 b2 T `i2/2bi2b `2bmHi /QbX ú`2 HBx /Q mK T`
 /2bi2`2 `` MDQ /2 / /QbX 1- TQ` }K- +?2; @b2 `b +QM+Hmbä2b`

pQb +QM?2+BK2MiQb bQ#`2 Q bbmMiQ 2K [m2bi½Q- #2K +QKQ T
+QK 2H2 `2H +BQM* >Ab U-2iy yBX

KQiBp İ½Q T ` b2 /Qi ` iû+MB+ /2 _a M2bi2 i` # H?Q /2
7Q`M2+2` /2 KQ/Q 7Q`K H- i` pûb /2 mK T`QiQ+QHQ- Qm b2D - i
Q# +F;`QmM/ 2H #Q` İ½Q /Q + i€HQ;QX a2`½Q B/2MiB}+ /Qb Qb
Q`; MBx +BQM Bb T ` aJ 2tBbi2Mi2b TQ` K2BQ / _aX

9X9XR 6HmtQ /2 iBpB/ /2b T ` `2pBb½Q bBbi2K€iB+

6B;m3BHmbi` Q ~mtQ / b iBpB/ /2b [m2 Q`B2MiQm 2t2+mİ½
` /Q Q T`QiQ+QHQ /2 `2pBb½Q bBbi2K€iB+Q#2) MiB/QM QB TTM/BB#B
Qb T`Q+2/BK2MiQb 2 /2+Bbä2b /Q ~mtQ /2 iBpB/ /2b / _a`2 HBx
`2T2iB/Q TQ` Qmi`Qb T2b[mBb /Q`2b [m2 Q#i2`½Q Qb K2bKQb `2
T`QiQ+QHQ # b2Qm @b2MpyiV# H?Q /2

6B;m` 3 6HmtQ /2 iBpB/ /2b T ` `2pBb½Q bBbi2K€iB

9X8 J2iQ/QHQ;B /2 /2b2MpQHpbK2MiQ

a2`€ /Qi / mK / Ti İ½Q / K2iQ/QHQ;B a6.2K2MpQHpbB/ /
T /`ä2b `[mBi22m+`Bb ôM 6B;m`

9X8XR a+`mK

P a+`mK û7mK2rQM [m H TQ/2@b2 `2bQHpb2` T`Q#H2K b +QK
T`Q/miBp +QK Q T`BM+BT H Q#D2iBpQ /2 ;2` ` T`aQ >mi@b /2 K BQ
"1_c alh>1_G lkyReX AbiQ û7 pQ`2+B/Q 2KT`2; M/Q@b2 mK #Q`
2 BM+`2K2Mi H [m2 T`QKQp2 +QMi`QH2 /2 `Bb+Qb 2 mK K2H?Q
a+`mK 7mM/ K2Mi @b2 MQ 2KTb`BbKQ- }`K M/Q [m2 Q +QM?2+B
2t2`B M+B X a½Q i` b Qb TBH `2b [m2 bmbi2Mi K BKTH2K2Mi İ

RЖ` MbT ` M+B , bT2+iQb bB;MB}+ Mi2b /Q ~mtQ /2p2K b2` p
T2HQb `2bmHi /QbX +QK mMB+ ĩ½Q /2p2 b2` 7`2[m2Mi2 2-
+QM} Mĭ /Qb 2MpQHpb/Qbc

kXAMbT2ĭ½Q, i` MbT ` M+B iQ`M BMbT2ĭ½Q TQbbQp2HX
2722/# +QMbi Mi2b T ` iQK ` /2+Bbä2b +QK `2H ĩ½Q / T
Qm T`Q/miQc

jX / Ti ĩ½Q, BMbT2ĭ½Q iQ`M / Ti ĩ½Q TQbbQp2HX / Ti ĩ
i2b MQ T`Q/miQ 2K /2b2MpQHpbK2MiQ Qm MQ T`Q+2bbQc
/2 +Q`/Q +QK Qb `2bmHi /QbALBYFK2ĭ½Q U

P Q#D2iBpQ / a+`mK û 2Mi`2; ` bQ7ir `2 /2 [m HB/ /2- i M
B Mi2`p HQb +m`iQb 2 }tQb /2 a2KBTQibB.MiB2m+RXXIX * / 7 b2
/Q +B+HQ /2 /2b2MpQHpbK2MiQ /2 bQ7i1.G1@+QMmBVQKQb T
`2[mBbBiQb- M€HBB2- T`QD2iQ- 2pQHmĭ½Q T`BQm`2;QMDũmKMiT
/2aT`BMiib1.G12i-RXXIX HũkT`BMtBbi2K Qmi`Qb 2p2MiQb T`2
a+`mKT`B Mi SH MMBM;- . BHv a+`mK- aT`B Mi X2pBi2rb 2p2BMQb
b½Q mb /Qb T ` +`B ` `2;mH `B/ /2 /2 2M+QMi`Qb /Q iBK2 #2K+
/2 `2mMBä2b M½Q /2}MB/ b MQ a+`mKX * / mK /2bb2b 2p2MiQb
mK /m` ĩ½Q K€1BKGU2i-RXXIX

S ` /2}MB` b2 Q [m2 7QB T`Q/mxB/Q û TQi2M+B HK2Mi2 2M
i2` /2}MBĭ½Q /2.2}QMFiBQM Q7.QQM@ #2K 2bi #2H2+B/ X /2}
T`QMiQ û+mK+F/2BBTQb /2 i` # H?Q [m2 Q iBK2 /2p2 `2 HBx `+C
/2+H ` ` Q i` # H?Q /2b2MpQHpbK2MiQ QMiQ-UyVIX

* / aT`BQm2` +QK mK +2`iQ M9K2`Q /2 Bi2Mb /2 i` #@H?Q-
FHQPb T TũBb `2bTQMbeP2Bb T2HQaF` QK2hbQb`i2Tũ 2Q2MbiBKQ
TQS`Q/m+i P-r.22HQTK2Mi2hr2K`mK J U21.G12i-RXXIX

9X8Xk 6HmtQ /2 iBpB/ /2b /2 /2b2MpQHpbK2MiQ

6Q` K`2 HBx / b / Tai+ĭã2pBQQ Q 7 iQ /2 ? p2` bQK2Mi2 r
#`Q M 2[mBT2 T ` a+QKkKChXQKQ`i MiQ- b2`½Q miBHBx /Qb, 2M
aT`BM2`BKaTMB Mi SH2MmBBH Bx.2½QBiBQM Q 2QMQ /Qi /Qb Q
T`Q+2/BK2MiQb /2b+ BXiQbTMBMBbQ /m` ĩ½Q /2 /m b b2K M b /
[m2 b ?Bbi:`B b /2 mbm€`BQ b2`½Q / / b +QKQ T`QMi b b2;mB
.2}MBiBQM Q7QnQM.2.ôVX

6B;m` N 6HmtQ /2 iBpB/ /2b T ` Q /2b2MpQHpbK2MiQ /2

9Xe *`QMQ;` K

Pb +`QMQ;` K b `272`2Mi2b Qb h** R 2 k b 1/2 Q 8-2} Mb@Qb M b
T2+iBp K2Mi2X * #2 `2bb Hi `ó[m`2b2MipBh`TQK` b2` Hi2` / -
Q+Q``2M/Q Mi2b /Q TH M2D /QX

h #2H 9 *`QMQ;` K /2 iBpB/ /2b /Q h**nRX

iBpB/ /2b	62p2`2B`QJ`IQ	#`BH	J BQ	CmM?Q
.2}MB`i2K	s			
G2p Mi ``272`2M+B Hi2i`B+Q BM B+B H	s			
1H #Q` `T`QTQbi	s			
1bi #2H2+2`K2iQ/QHQ;B /2 T2b[mBb s				
1bi #2H2+2`bmTQ`i2 i2+MQHi;B+Q s				
_2 HBx `T2b[mBb #B#HBQ;`€)+ s		s		
AKTH2K2Mi `T`Qp /2 +QM+2BiQ		s	s	
_2}M `KMQ;` }			s	s
T`2b2Mi `h**nR				s

h #2H 8 *`QMQ;` K /2 iBpB/ /2b /Q h**nkX

iBpB/ /2b	;QbiQ	a2i2K#`Q Pmim#`QLQp2K#`Q.2x2K#`Q			
172im `+Q`2Iä2b	s				
.2b2MpQHpb2`T /`ä2b `[mBi2im` Bb s			s	s	
M HBb ``2bmHi /Qb		s	s	s	
_2}M `KMQ;` }				s	s
T`2b2Mi `h**nk					s

9Xd *QMbB/2` Iä2b T `+B Bb

1bb2 + TQimHQ i2p2 +QKQ BMimBiQ T`2b2Mi ` Qb KûiQ/Qb
K2MiQ /2bb2 i` # H?QX 1H2 +QMiûK b 2b+QH? b K2iQ/QHi;B+ b-
pB/ /2b KQ/2H /Qb [m2 ;mB ` K +QM/mI½Q /2bi2X 1H #Q`Qm@b2
/ _a- 27QB T`2b2Mi / mK pBb½Q i2KTQ` H/ b iBpB/ /2b- TQ` H

8 S`QTQbi

$b_2; mB` b_2` \in T` 2b_2Mi / Q + / TQM_i Q T` QTQbi Q MQb Q \#$
 $/ 2i H? / QbX . 2bb` 7Q` K - Q + TQimHQ 2bi \in Q` ; MBx / Q T`$
 $+ i \in HQ; Q T` QTQbi Q - 2M_7 i Bx / Q + QKQ Q K_2 b K Q b_2` \in + QMbi` m$
 $+ TQimHQ - 7Q` M_2 + 2` mK B / 2B K Bb + QM + ` 2i bQ \#` 2 T` QTQ$

8XR P + i \in HQ; Q

$L b_2 i \frac{1}{2} Q d 7QB \# Q` / / Q Q + QM + 2BiQ / 2 + i \in HQ; Q / 2 T /` \ddot{a}$
 $+ QKQ T` 2b_2Mi / Qb Qb Bi_2 Mb [m_2 Q K_2 b K Q / 2 p_2 7Q` M_2 + 2` X`$
 $+ i \in HQ; Q / 2 T /` \ddot{a} 2b` [mBi_2 im` Bb Q` ; MBx + BQM Bb T` aJ`$
 $2K + i_2; Q` B T /` \ddot{a} 2bX$

$S` [m_2 b_2 + H bbB] [m_2 mK KQ / 2 HQ` [mBi_2 im` H + QKQ T`$
 $/ 2 p_2 i_2 M / 2` Qb + ` Bi\hat{u}` BQb / 2 + H bbB] + i \in HQ; Q / 2 T /` \ddot{a} 2b`$
 $+ ` Bi\hat{u}` BQb 7Q` K / 2} MBx + BQM Bb T` aJ`$
 $/ 2 i_2` KBM / + i_2; Q` B / 2 2bi` mim` Q` ; MBx + BQM HX$

8XRXR A/2MiB} + i \frac{1}{2} Q / Qb T /` \ddot{a} 2b` [mBi_2 im` Bb

$Q` 2 HBx` ` 2pBb \frac{1}{2} Q b Bbi_2 K \in iB + - Qb i` \# H? Qb` 2iQ` M$
 $/ 2 HQb` [mBi_2 im` Bb T` aJ` X 1bi_2 b b \frac{1}{2} Q + M/B/ iQb` T /` \ddot{a} 2b`$
 $KQ / 2 HQb M_2 + 2bbBi K / 2 mK p_2` B} + i \frac{1}{2} Q Tm` / / 2 bm b + ` +$
 $bB} + / Qb + QKQ T /` \ddot{a} 2b` [mBi_2 im` Bb Qm b_2` 2K / 2b + ` i / QbX$
 $+ i \in HQ; Q + QMi_2 M / Q - ; 2MmBM K_2 Mi_2 - T /` \ddot{a} 2b` [mBi_2 im` BbX$

$L b b_2 i \frac{1}{2} Q k X 8 \# Q` / @ b_2 Qb + QM + 2BiQb / 2 T /` \frac{1}{2} Q` [mBi$
 $Q` ; MBx + BQM BbX " b_2 M / Q @ b_2 M_2 bb_2 b + QM + 2BiQb - Qb b_2 ;$
 $T` + H bbB} + i \frac{1}{2} Q / Qb KQ / 2 HQb` [mBi_2 im` Bb B / 2 MiB} + / Qb$
 $2K T /` \frac{1}{2} Q` [mBi_2 im` H Q` ; MBx + BQM H,$

$R X Q / 2 b_2` B / 2 MiB} + / Q - M / 2 b + ` B i \frac{1}{2} Q / Q KQ / 2 HQ - Q i` BT \hat{u} T$

$kXP KQ / 2 HQ \hat{u}` 2T` 2b_2Mi / Q TQ` H; mK / B ;` K X$

$jXP KQ / 2 HQ + Tim` T` \in iB + + QK mK UQm b_2 D - TQbbmB T$
 $+ QM? 2 + B / b_2 - Q K_2 b K Q i_2 K T Q - bQHm i \frac{1}{2} Q M \frac{1}{2} Q \hat{u} ! \# pB V$

$9XP KQ / 2 HQ \# b_2 B @ b_2 2K 2bi` mim` b Q` ; MBx + BQM Bb + QM$

8XRXk *H bbB}+ İ½Q /2 T /`ä2b `[mBi2im` Bb 2K + i2

J HQURNNY€;X eRV +QMbB/2` i` b T`Q+2bbQb 7mM/ K2Mi Bb
aJ ,

Ç Dmbi2 K9imQ,@b2 /Q KQ/Q K Bb bBKTH2b /2 +QQ`/2M İ½Q QM
;2Mi2b +QKT `iBH? K b2mb `2+m`bQb pBb M/Q iBM;B` mK Q;
;2Mi2 i2K +QMi`QH2 T`ûpBQ bQ#`2 Qb Qmi`Qb- 2 iQK / /2 /2
+QMDmMiQX

Ç amT2`pBb½Q QB`Q`i`2 [m M/Q /QBb Qm K Bb ;2Mi2b D€ 2bi #2H2
QM K2MiQ 2K [m2 mK ;2Mi2 i2K H;mK +QMi`QH2 bQ#`2 Qb Q
+QQ`/2M İ½Q- Q bmt2`pBbQ` +QMi`QH Q mbQ /2 `2+m`bQb +Q
H?Q ?mK MQ- i2KTQ 2 /BM?2B`Q /Q T`Q+2bbQ /2 +QKTmi /Q`
i K#ûK TQ/2 T`2b+`2p2` +2`iQb bT2+iQb /2 b2mb +QKTQ`i K2

Ç S /`QMBx İ½Q,`2 [m M/Q Q bmt2`pBbQ` 2bi #2H2+2 T`Q+2/BK2
#Q`/BM /Qb b2`2K b2;mB/Qb 2K p€`B b bBim İä2bX Pb T`Q+
2KT`2b b Qm 2K bQ7ir `2 b½Q 2t2KTHQb /2 +QQ`/2M İ½Q TQ`

SQ` K2BQ /2bb2b T`Q+2bbQb 7mM/ K2Mi Bb /2 +QQ`/2M İ½Q
/2 +QQ`/2M İ½Q K Bb J G F L I R N O P € X ejVX a½Q 2H2b,

Ç J `F2ibJ2`+ /QB,T,Q/2K b2` +QMbB/2` /Qb mK 7Q`K /2 Q`; MBx İ½Q
Dmbi2 K9imQX Pb ;2Mi2b- + / mK /Qb [m Bb +QMi`QH `2+m`
2t2KTHQ- i` # H?Q- K iû`B @T`BK - #2Mb 2 /BM?2B`Q@- +QM
H;mMb /2 b2mb `2bT2+iBpQb `2+m`bQb T` H+ Mİ` Q Q#D2iB
i`Q+ /Qb- +QK Qm b2K +mbiQb 2tTHQ+BiQbX IK p2x [m2 mK +
mK +Q`/Q 2K [m2 Q ó+QKT` /Q`ôb2 iQ`M Q bmt2`pBbQ` /Q 7Q

Ç >B2` `+?fB-2B2` `[mB# bb,2B K@b2 2KT`Q+2bbQb /2 bmt2`pBb½Q /B
;`mTQ TQ/2 b2` /BpB/B/Q 2K bm#;`mTQb b2 K BQ` T `i2 / i` M
İä2b M2+2bb€`B TQ/2 Q+Q``2` 2K bm#;`mTQb 2 b2 bTQm+ b E
TQ/2K b2` i` i / b TQ` bmt2`pBbQ`2bX L2bb2 + bQ- TQ/2@b2 r
?B2` `[mB X Pb bm#;`mTQb TQ/2K b2` +QQ`/2M /Qb TQ` Dmbi
?B2`€`[mB+Q- /2T2M/2M/Q /Q /QKQMBQ /Q THB+ iBpQ 2 / b +

av+ URNM3/2 KQ/Q b2K2H? Mi2`F222B2Mi`+QKQ 2t2KTHQ
/2 Q`; MBx İä2b [m2 b½Q 2tTHQ` / b M HBi2` im` X`B2K@H2K2Mi
` `+?B2b+ URNM3}M2 [m2 2bi 2bi`mim` û 7Q`K / TQ` mK miQ
iQK / /2 /2+Bb½Q 2 +QMi`QH2 +QM+2Mi` / 2K mK 9MB+Q bQHm+

;`mTQ 2bT2+B HBx /QV 2K + / MQp2H / ?B2` `[mB X B Mi2`
p2`iB+ H /Q ;2Mi2 bmT2`BQ` Q bm#Q`/BM /Q 2 pB+2@p2`b c
2t2`İ K +QMi`QH2 bQ#`2 `2+m`bQb 2 iQK / /2 /2+Bbä2bX

L 2bi`mİm`F2iQ +QMi`QH2 û /Bbi`B#mQ/Q Qb ;2Mi2b [m2 -
Qm`2+m`bQb i` pûb /2 H M+2b 2 K2+ MBbKQb [m2 2MpQH p2K -
i` pûb /2 mK p `B€p2H- +QKQ Q +mbiQ- [m2 û m bu/*Q_T-` p H
R N M X

" b2 M/Q@b2 MQb +QM+2BiQb #Q`/ /Qb iû Q KQK2MiQ-
T ` +H bbB}+ ` b 2bi`mim` b Q`; MBx +BQM Bb /Qb T /`ä2b ` `
[m2 b2D K + i HQ; /QbX Pb +`Biû`BQb T ` +H bbB}+ ` mK 2b
>B2` `b½Q,

Ç >€ mK miQ`B/ /2 @ Qm b2D - mK ;2Mi2 Qm mK ;`mTQ /2 ;
iQK / /2 /2+Bb½Q 2 Q +QMi`QH2 /2 `2+m`bQbc

Ç +QKmMB+ İ½Q b2 /€ p2`iB+ HK2Mi2c / miQ`B/ /2 T ` Q b

Ç miQ`B/ /2 TQ/2 T`2b+`2p2` bT2+iQb /Q +QKTQ`i K2MiQ

Pb +`Biû`BQb T ` +H bbB}+ ` mK 2bi`mİm`F2iQ ½Q MBx +BQ

Ç L2M?mK ;2Mi2 TQbbmB +QMi`QH2 bQ#`2 Qb /2K Bbc

Ç .QBb Qm K Bb ;2Mi2b +QKT `iBH? K b2mb `2+m`bQb pBb
KmKc

Ç Pb ;2Mi2b +QKT2i2K TQ` i `27 b Qm`2+m`bQb i` pûb /2 H

Ç iQK / /2 /2+Bbä2b Q+Q``2 Kmim K2Mi2X

8XRXj 1H2K2MiQb T ` /2b+`Bİ½Q /Qb T /`ä2b `[n

b2İ½Q/Bb+mi2 bQ#`2 T /`ä2b /2 T`QD2iQ 2 bm;2`2 Qb 2H
T ` /2b+`2p @HQbX LQ + i€HQ;Q T`QTQbiQ TQ` 2bi2 i` # H?
2H2K2MiQb,

LQK2 /Q T /`MO,K2 /Q T /`½Q 2M+QMi` /Q M HBi2` im` c

_272` M+B2 2` M+B b T ` Qb i` # H?Qb [m2 /2b+`2p2K Q T /`½

* i2;Q`B+,H bbB}+ İ½Q /QJT`F2iQ Bİ` `g?v

S`Q#H2K`Q#H2K 2K [m2 Q T /`½Q #mb+ bQHm+BQM ` - /2b+`

aQHmİBQbi`mİä2b /2b+`2p2M/Q +QKQ Q T`Q#H2K TQ/2 b2` `2bQ
 S`QiQ+QHQB bb2bB2QK2MiQ û QT+BQM HX * bQ Q T /`½Q 2bi2
 2K H;mK TH i 7Q`K +2bbQp2H- Qb T`QiQ+QHQB Qm #B#HB
 `2M+B /Qbc
 JQ/2H ;2KB ;` K b /BbTQMB#BHBx /Qb T2H HBi2` im` `2T`2b2M
 i İ½Q miBHBx / /2p2 b2` T`QT`B / T` aJ +QKQ- TQ` 2t2K
 b2[m M+B UIJGV 2 /B ;` K B X

8Xk h` # H?Q _2H +BQM /Q

.m` Mi2 T2b[mBb T` 7mM/ K2Mi` # b2 i2i`B+ 2 7Q`KmH
 i` # H?Q- T-/2@b2 2M+QMi` `mK i` # H?Q b2K2H? Mi2- Q [m H b2
 CmMBQ UziyHX QTä2 mK +QH2İ½Q /2 T /`ä2b `[mBi2im` Bb T
 /Qb KBMBKBx `T`Q#H2K b /2 +QKmMB+ İ½Q 2 +QQT2` İ½Q 2Mi`
 b2 M 2ti` İ½Q /2 `[mBi2im` b 7`2[m2Mi2K2Mi2 miBHBx / b #2K +
 T /`ä2b T`iB` / 2ti2Mb½Q Qm +QKTQbİ½Q /2 T /`ä2b 2tBbi2Mi
 K2iQ/QHQ;B miBHBx / T` B/2MiB}+ `Qb T /2äm;Q# b2B @
 q2Bbb 2 E2UyyR@ [m2 #Q`/ T2M b T /`ä2b bQ# Q +QMi2tiQ / +QC
 iû+MBT+ii2`M KBMBQ; }K- Qb T /`ä2b 7Q` K ;`mT /Qb 2K +QH2i•M2
 }+ `2K +2bbQp2Bb Qmi`Qb /2b2MpQHp2/Q`2bX
 iû+MBT+ii2`M KBMBQ; b2` `2T`2b2Mi /RTJHLA6B; aİ HX
 kyyX P#b2`p @b2 [m2 Qb T /`ä2b b½Q 2ti` Q/Qb /2 THB+ İä2b #2
 b2;mB/ - TQbb K b2` ;`mT /Qb 2K + i€HQ;Qb /2 KQ/Q bQHm+BC
 Q`B;BM7MKQrQ[rB b2`½Q miBHBx /Qb T` /2b2MpQHp2` THB+ İä

6B;m` Ry 1ti` İ½Q /2 T /`ä2b 2 Q +B+HQ /2 pB/m MBQK 2i /HXQX
 UyyjTmE PaEAJAkyykX

8Xj *QMbB/2` ä2b T `+B Bb

T`QTQbi /2bi2 i` # H?Q û # b2 / M B/2MiB}+ I½Q /2 T
 Q`; MBx +BQM Bb T ` aJ X S ` BbbQ 7QB `2 HBx / mK `2pBb
 2 `2;Bbi` ` /B72`2Mi2b KQ/2HQb `[mBi2im` Bb miBHBx /Qb im
 T /`ä2b `[mBi2im` BbX *QK B/2MiB}+ I½Q /2bi2b T /`ä2b- /r
 i` # H?Q b2`€ +QKTQ` Q + i€HQ;Q +QK 2bi2b BMbmKQbX

e _ 2 b m H i / Q b T ` + B B b

L2bb2 + TQimHQ- b2`½Q T`2b2Mi /Qb Qb T`BM+BT Bb`2
K2MiQ- +QKQ T`QTä2 Q +`QM;` K /2 iBpB/ /2b TH M2D /Q T
b2Mi /Qb Qb`2bmHi /Qb / _a 2 Qb p MİQb`272`2Mi2b Q /2b2
HQ;Q- Qm b2D - `2 HBx İ½Q / T`Qp /2 +QM+2BiQX

eXR _ 2pBb½Q bBbi2K€iB+

L2bi b2İ½Q b½Q`2H i /Qb Qb`2bmHi /Qb Q#iB/Qb /`2p
K2MiQX

eXRXR S`BK2B`Q +B+HQ /2 #mb+

S` Q T`BK2B`Q +B+HQ /2 #mb+ - 7Q` K 2bim/ /Qb Qb`
i K2Mi2 Q Q#D2iQ /2 2bim/QX 1bi2b 2bi½Qk XİBbbBQb Q#Q2T2 Q
b T H p` b@+? p2b 2 bBM-MBKQb [m2 TQi2MbbBHK;#Mi2+2bm
b iBb7 il`B X

bi`BM;bmHi Mi2 /2bi2 Tô Qm+İbbQ27QBa,vbi2Kô L. UóP`; ME
ai`m+im`2ôP_ óP`; MBb iBQM ai`m+im`2ôV X.1Mi`2?BM2QimM b
/m b 7QMi2b /2 T2b[mBb miBHBx / b M½Q 7Öi`B MQEQ2Mi/QQ
/2b+`i / 2`2T2Mb / T` Q T`!tBKQ +B+HQ /2 #mb+ X

eXRXk a2;mM/Q +B+HQ /2 #mb+

P b2;mM/Q +B+HQ /2 #mb+ 7QB 7mM/ K2Mi H T` b2 Q#i2
[mBb 2 /Qb`mKQb [m2 K2bK /2p2`B iQK`X SQbbB#BHBiQi
`[mBi2im` Bb /2b2MpQHpb/Qb T` aJ + M/B/ iQb T /`ä2b`
Q`B - b½Q KQ/2HQb /2b2MpQHpb/Qb T` bBim İä2b 2bT2+Q}+
rQ`Fb?Q@+QKK2Q+Tmi İ½Q 2K Mmp2K 2 BM7` 2bi`mim` X

.2Mi`2 Qb`iB;Qb`2D2Bi /Qb- KmBiQb +QMiBM? K /2b+`Bİ
K2Mi2 Q`B;BM /Qb T` bBim İä2b 2bT2+Q}+ bX SQ`ûK-7Q` K
b2mb +QMi2tiQb 2 M½Q 7 x2` T`i2 /Qb Q#D2iBpQb /2bi2b`iB
p2Bb 2fQm ;2Mû`B+ bX 1K bmK - Qb`2bmHi /Qb Q#iB/Qb T`iE
M h #2M

h #2H e _2bmHi /Qb Q#iB/Mb+BQKH

6QMi2 /2 T2b[mBb	ai`BM2 #mb+	Lp /2 `iB;Qb `2iQ`M /Qb	L9K2`Q /2 `iB;Qb +2BiQb
---------------------	-------------	-------------------------------	-------------------------------

A111tTHQ`2`oJmHiB ;2Mi avbi2Kô Lde	Rk
UóP`; MBx iBQM ai`m+im`2ôP_	
óP`; MBb iBQM ai`m+im`2ôV	

a+B2M+2 .B`2+JmHiB ;2Mi avbi2Kô Ljd	8
UóP`; MBx iBQM ai`m+im`2ôP_	
óP`; MBb iBQM ai`m+im`2ôP_	
óP`; MBx iBQM H ai`m+im`2ôP_	
óP`; MBb iBQM H ai`m+im`2ôV	

Pb `iB;Qb +2BiQb 2 Q#iB/Qb T2A117QMHQ%2QTH2BpmBQb
b2;mB` ,

Ç 1K#2//BM; BMi2HHB;2Mi ;2Mib iQ 2M #H2 T?vbB+ H `Q#QiB-
U haPL-kyyNc

Ç JQ/2HHBM; 1M2`;v M/ h` MbTQ`i AM7` bi`m+im`2b b JmHiB
:2M2`B+ PMUQHtQG Eaw-RyyEc

Ç aim/v QM *QQT2` iBQM J2+? MBbK BSM L; 2Mii -RyyWc

Ç *QHH2+iBp2 ;2Mib M/ *QHH2+iBp2 AMi2MiBQMGA B1cIbBM;
6_1.-kyyWc

Ç *QKTmi iBQM H P`; MBW 1BQMyh2Q`v

Ç *QM~B+i _2bQHmiBQM rBi?BM JmHiB@ ;2Mi uGAbi2KI BQ *QHH
>l-kyyBc

Ç _2b2 `+? QMi?2 "B//BM; AM7Q`K iBQM AMi2;` i2/>1Lbi2K Q7 :2F
sA Pc aP-LkyyBc

Ç JmHiB@ ;2Mi " b2/ SQr2` :`B/. i AMi2;` iBQM cM/ la? `BM; SH
a>AkyyNc

Ç _2b2 `+? QM :`B/@a2`pB+2 " b2/ oB`im H S`Q/m+ib 1tT2`B2M+
iBM; `+?Bi2+im`2 BM 1@+QKUK21-L2kyyWc

Ç lbBM; JmHiB ;2Mi a2H7@Q`; MBx iBQM h2+?MB[m2b iQ AK
BM oB`im H aQ+B HUJQK*Am MB PB2b GGPc C -k P R/c

Ç :2M2`B+ _2+m`bBp2 JmHiB ;2Mi JQ/2H iQ aBKTHB7v G `;
P#b2`p LBQM:c P**1GGPc C J-R y R/c

Ç JmHiB@ ;2Mi avbi2K iQ amTTQ`U*"2AiBp2 q-C y R/c QT

Pb `iB;Qb +2BiQb 2 Q#iB/Qb T2a+ B2QM-i2 b/2 Q +b iBiB/Qb
b2;mB` ,

Ç HQr@H2p2H`2bQm`+2 HHQ+ iBQM BM M ;2MU@#P b2/ *H
2i HkY R/c

Ç *QKT `BbQM Q7 iB;?iHv M/ HQQb2Hv +QmTH2/ /2+BbBQM
iBQM L:c > La> -ky R/c

Ç 1:Aa, ;2Mi Q`B2Mi2/ QU;L M Bb 2B Q H M M 6

Ç 1tT2+i iBQM @Q`B2M A2/EKQ/2d H B M; h a P a c k y l y A c a

Ç JmHiB@ ;2Mi avbi2K .2p2HQTK2Mi " u2/1Q M 1 R` C I M B x Li B Q M
" P h h A k y y e X

1K`2mMB½Q +QK Qb T`Q72bbQ`2b Q`B2Mi /Q`2b /2bi2 i` ;
b2H2+BQM /Qb 7QB /Bb+miB/QX A/2MiB}+Qm@b2 [m2 #Q`/
/B}+mHi M/Q Q T`ltBKQ T bbQ / T2b[mBb , T`Qp /2 +QM+2B
i` # H?Q 7QB B Mi2``QKT B/ 2 Q 2b7Q`İQ pQHi /Q T ` `2 HBx

1bi b2İ½Q T`2b2Mi Qb iQb+QK m MBjK R B P Q 2 B A K 2 M b 2 T ½
[m2 7 +BHBi2 2Mi2M/BK2MiQ /Q T`BK2B`Q T /`½Q `[mBi2im`
Q*QMi` +i u 2 2 İ e X Q X 1bb2 T /`½Q 7QB +QM b B /2` /Q +QKQ mK
T2`K Bi BM /Q +QM /mxB` iBpB/ /2b +`QiB+ b- BM2`2Mi2b " 2bb
TQ/2`B K`2bmHi `2K B M b m +2bbQb- +QKT`QK2i2M/Q T2b[mB

.2Mi`2 2bb b iBpB/ /2b- /2bi + K@b2, BMbi H İä2b /2 TH i
i2+MQHi;B+Qbc +QM};m` İä2b /2 K#B2Mi2c /2b2MpQH pBK2M
H? M/Q /2 7Q`K +QH #Q` iBp 2 T`QiQ+QH / c 2 /2b2MpQH pB
T /`½Q `[mBi2im` H Q`B2Mi M/Q@b2 T2HQ`272`2M+B Hi2i`B
/ /Qb T ` 2K# b K2MiQ 2 BKTH2K2Mi İ½Q /2bb2 T`QD2iQ- `2b

+QM+2BiQ +QM72`2- /2Mi`2 Qmi`Qb / /Qb- K BQ` +`2/B#BHB/ /2 [
H?QX *QKQ D€ +QHQ+ /Q Mi2`BQ`K2Mi2- 2H #Q` İ½Q TH2M /Q
}+ İ½QfKQ/2H ;2KfBKTH2K2Mi İ½Q /Qb /2K Bb T /`ä2b /2 `[mBi2
M T`ltBK 2i T /2bb2 i` # H?Q- +QM7Q`K2 +`QMQ;` K Ub2İ½Q b2

eXkXR 6AS *G

P 6AS @ *G # b2B @b2 2K K2Mb ;2Mb [m2 `2T`2b2Mi K İä2b
KmMB+ iBpQKQMB+ MBpQKQibT`2b2MiR X6B½Q /2}MB/Qb QiQ/Q
mK +QMDmMiQ /2 kk iQb +QKMBH;BMQ/Qb #QHK Bb +QKmK2M
/Qb bBM7Q`K- `2[m2bi- ;`22--M2Q7mM22`ibQ/Q/Fim` K 2bb M+B /
K BQ`B / b 7Q`K b /2 +QKmMB+GIA½QJA½B+* U_1c :_11LqPP.
kyydT€;X RjVX

6B;m` RQKKmMB+ iBpQMBH72KBUy-RT€;X jkV

a2;mM2QH B72KBM2- * B`kyyd2bMMQK b 6AS 2bi #2H2+2K [
mK ;2Mi2 /2p2 b2` + T x /2 `2+Q#K m[MBH[2B2Q KiQMBKQ- `2bTQM/
+QK mK K2MMQ2@mM/2`bQQK2Mb ;2K`2+2#B/ M½Q TQbb b2` T

*QK # b2 M2bi2b iQb +QKmMB+ iBpQb- Q 6AS /2}MBm mK +Q
BMi2` İ½Q- +QMbBbiBM/Q + / mK /2 mK b2[m2M+B /2 iQb +QKn
İä2b KmHiB@K2Mb ;2Mi+QKQİ½QXJT ` Q 2bi #2H2+BK2MiQ /
+Q`/Qb 2 p€`BQb iBTQGAH2BAHä2b*UA_1c :_11kqP€T.€;
R9VX

h #2H d iQb +QKMB+ iBpQb 6AS' 2HH B/72KB/QX-6QM i2,2 :`2
 Uky y-dT€;X RNVX

6AS +QKKM MB+ iBp2 +i	@2b+`Bİ½Q	
+2Ti S`QT	Qb İ½Q / 2 +2Bi `mK T`QTQbi T`2pB K2Mi2 bm#K2iB/ T`	
;`22	İ½Q / 2 +QM+Q` / `2K`2 HBx ` H;mK İ½Q- TQbbBp2HK2	
* M+2H	İ½Q / 2 mK ;2Mi2 BM7Q`K M/Q Qmi`Q ;2Mi2 / 2 [m2 Q T`BK	
* HH 7Q` S`QT	Qb İ½Q / 2 +QMpQ+ İ½Q / 2 T`QTQbi b T` 2t2+mi ` mK / 2i2`K	
*QM}`K	P`2K2i2Mi2 BM7Q`K Q`2+2TiQ` [m2 mK / / T`QTQbBİ½Q ü	
.Bb+QM}`K	P`2K2i2Mi2 BM7Q`K Q`2+2TiQ` / 2 [m2 mK / / T`QTQbBİ½Q ü	
6 BHm`2	İ½Q / 2 /Bx2` Qmi`Q ;2Mi2 [m2 ?Qmp2 i2Mi iBp / 2`2 H	
AM7Q`K	P`2K2i2Mi2 BM7Q`K Q`2+2TiQ` [m2 mK / / T`QTQbBİ½Q ü	
AM7Q`K A7	İK İ½Q K +`Q T` Q ;2Mi2 / İ½Q T` BM7Q`K` Q / 2biBM	
AM7Q`K _27	İK İ½Q K +`Q [m2 T2`KBi2 Q`2K2i2Mi2 BM7Q`K` Q`2+2	
LQi IM/2`biQ	P`2K2i2Mi2 /Q iQ UTQ` BM7Q`K` Q`2+2TiQ` DVTQ` 22t2KTHQ	
S`QT ; i2	P`2K2i2Mi2 i2K BMi2Mİ½Q / 2 [m2 Q`2+2TiQ` i` i2 K2Mb ;	
S`QTQb2	İ½Q / 2 T2` ;mMi ` Qmi`Q ;2Mi2 b2 mK / 2i2`KBM / T`QTQ	
S`Qtv	P`2K2i2Mi2 / 2b2D [m2 Q`2+2TiQ` b2H2+BQM2 ;2Mi2b / 2 /	
Zm2`v A7	İ½Q / 2 bm#K2i2` mK T`QTQbi T` 2t2+mi ` mK / 2i2`K	
Zm2`v _27	İ½Q / 2 T2` ;mMi ` Qmi`Q ;2Mi2 T` Q Q#D2iQ` 272`B/Q T	
_27mb2	İ½Q / 2`2+mb ` 2t2+mİ½Q / 2 mK / 2i2`KBM / İ½Q- 2 2tTH	
_2D2+i S`QT	Qb İ½Q / 2`2D2Bi `mK T`QTQbi / 2`2 HBx İ½Q / 2 H;mK İ½	
_2[m2bi	P`2K2i2Mi2 bQHB+Bi Q`2+2TiQ` [m2 2t2+mi2 H;mK İ½Q	
_2[m2bi q?2	MP`2K2i2Mi2 [m2` [m2 Q`2+2TiQ` 2t2+mi2 H;mK İ½Q [m M	
_2[m2bi q?2 p2`	M2`K2i2Mi2 [m2` [m2 Q`2+2TiQ` 2t2+mi2 H;mK İ½Q bb	
am#b+`B#2	P iQ / 2 bQHB+Bi `mK BMi2Mİ½Q T2`bBbi2Mi2 / 2 MQiB)+`	

eXkXk C'2.1 pBQm`b

p m+?2`k'y [RGLA 61 JAL 1-2 j y W X](#)

Ç aBKTH2"2? pBQm`+H bb2 #€bB+ bm#2biBK / [m2 pQ+ TQ/2
 p€`B b K M2B` b 2 [m2 KmBi b p2x2b + # TQ` b2` K2H?Q` b
 +QKTQ`i K2MiQb T`QKBbbQ`2b b½Q 2M+QMi` /Qb +QK H;mK
 *v+HB+"2?, pBQm`+QKTQ`i K2MiQ T2`K M2+2 iBpQ 2M[m MiQ
 pBpQ 2 b2`€ +? K /Q `2T2iB/ K2Mi2 Tib + / 2p2MiQX JmBiQ
 `2+2Tİ½Q /2 K2Mb hBM5X`R23Nj mBK mQKTQ`i K2MiQ +Q+HB+G
 T2`BQ/B+ K2Mi2 2t2+mi H;mK +i/B;Q /2}MB/Q T2HQ mbm€`B
 PM2a?Qi"2?, [ABDQ](#) 2t2+mi mK p2x 2 KQ``2 XXX L½Q û `2 HK2
 Q /BbT `Q TQ/2 b2` /BbT ` /QqMF2? Q2? p;B[Qm 2t2+mi H;mK
 +i/B;Q /2 mbm€`BQ mK p2x 2K mK [K2+2Bpiz](#) "2bTQ`BQm`Q
 /2b2M+ /2B [m M/Q mK /2i2`KBM /Q iBTQ /2 K2Mb ;2K û `2+2
 HBKBi2 2tTB` VX

*QKTQ`i K2MiQb +QKTQbiQb

S ` HH2H"2? pBQm`, +QMi`QH mK +QMDmMiQ /2 +QKTQ`i K2I
 2KT ` H2HQX P BKTQ`i Mi2 û +QM/Bİ½Q /2 iû`KBMQ, TQ/2KQ
 i2`KBM [m M/Q hP. a b +`B Mİ b 2bi½Q +QM+HmQ/ b- L +`B M
 ZI GZI1_ +`B Mİ 2bi€ +QM+HmQ/ X

a2[m2MiB H"2? pBQm`, 2bi2 +QKTQ`i K2MiQ 2t2+mi b2mb +
 mK Tib Q Qmi`Q 2 i2`KBM [m M/Q Q 9HiBKQ }H?Q i2`KBMQmX

eXkX*jQMi` +i L2i

LQK2 /Q T /`½QMi` +iXL2i

[_272` M +B2 H HB 72 KB M 2 - * B` Uky y-dT E, X Q V H-HB 72 KB Uky 2-i HX](#)
 T€;X jRVX

* i2;Q`BJ,`F2Xb

S`Q#H2kK ;2Mi2 UQ BMBiBQ[Q2m/2b2D i2` H;mK i`27 2t2+m
 TQ` mK Qm K Bb ;2Mi2b UQb_2bTB+M/T`MB1b/Q/2b2D QiBKB@
 x `mK 7mMİ½Q [m2 + ` +i2`Bx i`27 X 1bi 7mMİ½Q û +QK
 2t2KTHQ- +QKQ +mbiQ- i2KTQ iû +QM+Hmb½Q"-1/B@i`B#mBİ
[GA61JAL1c * A_1c :_11 LkyPyX](#)

aQHmİ½Q, mK /2i2`KBM / i`27 - [m H[m2` M9K2`Q /2 T `iB+BT M
 /2` +QK mK T`QTQbi c Qb /2K Bb /2p2K `2+mb `X b M2;Q+B İ

6B;m` Rk JQ/2HQ IJG / ?B2` `[2m?Bp BX-610 M'622; HB72KBM2 2i
UkyYk

Qb S `iB+BT Mi2b [m2 T`QTmb2` KX P AMB+TB QQQbQbB2-B
Qmi`Qb ;2Mi2b i` pûb / 2KBbb½Q /2 mK +QMpBi2`HF`2b2
7Q`S_PSPVa[1ma2 2bT2+B}+ i`27 2 [m Bb[m2` +QM/Biä2b [m
bQ#`2 2t2+mï½Q / i`27 X

Pb T `iB+BT Mi2b [m2`2+2#2K Q +QMpBi2` T`2b2Mi i½Q /
TQi2M+B Bb +QMi` i /Qb 2 b½Q + T XMD / 2bT`QbimKXD.2K226
b½Q Q M9K2`Q /2 T`QTQbi b T ` `2 HBx ` i`27 - 2bT2+B}

T`QTQbi /Q S `iB+BT Mi2 BM+HmB b T`û@+QM/Biä2b [m
T ` i`27 - [m2 TQ/2 b2` Q T`2iQ- Qi2KTQ 2K [m2 i`27 b
iBp K2Mi2- Qb S `iB+BT Mi2b TQ/2K b2`2+mb ` T`QTQ`X
Q AMB+B /Q` p HB Q p HQ` `2+2#B/Q

S`QiQ+QHQB bbQ6-AS / QbQMi` 2i i€L 2ibQ+B /Q 2bi2 T /`½Q 2
`2T`2b2Mi /Q T2HX 6B;m`

P 6AS @*QMi` T+2@KLBi2 [AmBQ B2 Mq`B2*mKH 7Q`S`Q*TCW H
mK +QMDm_MbQT QM/2`HB2 bm b T`QTQbi b 2- TQ` }K- `2 H
+2Bi M/Q mK / b T`QTQbi b Qm iû K2bKQ`2D2BJAM/Q2i iG
HXyYkX

K2Mb ;2K *6S +QMiûK i½Q b2` `2 HBx / 2- b2 M2+2
2t2+mï½Q XbF Q MT Q`/2K `2bTQM/2` +QK b b2;mS`Q2@k2 Mb

6B;m` Rj S`QiQ+QHq /2 AMi2` İ½Q 6AS2@*HGM2KBUQy-2iiXH6QMi2
T€;X jeV

bm T`QTQbi +QKTQbi TQ` T`û@+QM_2B7İrãT2 2 - `+2+mi Q 2@i 2Krt Q
LQi@IM/2`2KQ+QbQ /2 7 H? b /2 +QKmMB+ İ½QX

T!b p HB `iQ/ b b TAQMBQBi Q+BX bm 2b+QH? 2 BM7Q`K [m
`2D2Bi / b 2 [m Bb 7Q` K +2Bi b U+i+2püS/ QKTQMbb H22K bbBK
[m2 +QKTH2i K bm bi `27 b-A`27 QKMB2KH+Q Q /2 bm İ½Q @ +Q
}M HBx / Qr6 BQXmQ2

P AMBiBT Q2 /2+B/B` + M+2H `Q T`QiQ+QHq*2 Mp 2VM2/b mK K2
/ İ½Q i2` bB/Q`2 HBx / 2 9HiBK K2Mb ;2K i2` bB/Q`2+2#B

P 6AS @*QMi` û+B@I2i2K2Mi /Q TQ` /QBb #QMT`Q+ii L22MMQBi B @
iQ`2*QMi` +iL2i_2bXTQM/BK2B`Q- im bQ# Q TQAMBi/B pB`bi /Q
2 +mB/ /Q i2KTQ HBKBi2 /2 2bT2` / b T`QTQbi b dH H#K+F2 T`Qp
T` + / 2bi /Q /Q T`QiQ+QHqX PQ+QK FQL2iK2MTiQ Mb/Q#
Q TQMiQ /2 p2bTQM/2`2bTQMb€p2H T`BM+BT HK2Mi2 TQ`
bQHB+Bi / - 2MpB `T`QTQbi b Qm`2+mb `Q 2MpBQ /2 T`QTQ

JQ/2H ;2K2bi2 T /`½Q TQ/2 b2` `2T`2b2 RIX /Q T2H 6B;m`

R ?iiT,ffd /2XiBH #X+QKf/Q+f TBfD /2ft`QiQf*QMi` +iL2iAMBiB iQ`X?iKH
k ?iiT,ffd /2XiBH #X+QKf/Q+f TBfD /2ft`QiQf*QMi` +iL2i_2bTQM/2`X?iKH

6B;m` R9 S`QiQ+QHq /2 Bmi2` İ½Q 6A"SH*QBMi2K+B M2iX 6BQ M i2
2MrQ Q y-dT€;X kjV

AKTH2K2Mi İ½Q /2 /2KQMbi` ` G6AS` @QQMi` -+ũ @2b2H` BiQ Q 2t2K
TH"QQF h` /BQM M2+B/Q T2H TH iX 7Q / Q bQ b/2i H?2b / BKTH
i İ½Q- +QM};m` İ½Q /2 K#B2Mi2 2 T bbQb T ` 2t2+mİ½Q b
"XR

eXj * i€HQ;Q /2 T /`ä2b `[mBi2im` Bb Q`;

1bi b2İ½Q T`2b2Mi Qb iQb +QKm MBjK RBP Q2B`AKS2 Mb2T`İ½
[m2 7 +BHBi2 2Mi2M/BK2MiQ /Q T`BK2B`Q T /`½Q `[mBi2im`
Q*QMi` +i 72İ½QXX 1bb2 T /`½Q 7QB +QMbB/2` /Q +QKQ mK
T2`KBiBM/Q +QM/mxB` iBpB/ /2b +`QiB+ b- BM2`2Mi2b " 2bb
TQ/2`B K`2bmHi` 2K BMbm+2bbQb- +QKT`QK2i2M/Q T2b[mF

.2Mi`2 2bb b iBpB/ /2b- /2bi + K@b2, BMbi H İä2b /2 TH i
i2+MQHi;B+Qbc +QM};m` İä2b /2 K#B2Mi2c /2b2MpQHpbK2M
H? M/Q /2 7Q`K +QH #Q` iBp 2 T`QiQ+QH / c 2 /2b2MpQHpbH
T /`½Q `[mBi2im` H Q`B2Mi M/Q@b2 T2HQ`272`2M+B Hi2i`B
/ /Qb T ` 2K# b K2MiQ 2 BKTH2K2Mi İ½Q /2bb2 T`QD2iQ- `2b
+QM+2BiQ +QM72`2- /2Mi`2 Qmi`Qb / /Qb- K BQ` +`2/B#BHB/ /

H?QX *QKQ D€ +QHQ+ /Q Mi2`BQ`K2Mi2- 2H #Q` İ½Q TH2M /Q }+ İ½QfKQ/2H ;2KfBKTH2K2Mi İ½Q /Qb /2K Bb T /`ä2b /2 `[mBi2 M T`ltBK 2i T /2bb2 i` # H?Q- +QM7Q`K2 +`QMQ;` K Ub2İ½Q b2

eXjXR 6AS *G

P 6AS @ *G # b2B @b2 2K K2Mb ;2Mb [m2 `2T`2b2Mi K İä2b KmMB+ iBpQK K Q MB+ MBpQK Q i b T`2b2Mi R X 6B ½ Q`/2}MB/Qb Q iQ/Q mK +QMDmMiQ /2 kk iQb +QK 6MK B H;B M Q / Q b # Q H K Bb +QKmK2M /Qb b 6M 7Q`K- `2[m2bi- ;`22- -M2Q 7m M 22`i2iQ Q/Fim` K 2bb M+B / K BQ`B / b 7Q`K b /2 +QKm MB+ G 1 ½ Q J A L B + * U _1 c : _1 1 L q P P . kyydT€;X RjVX

6B;m` R Q K K m MB+ i B p 2 Q M 2 b H B 7 2 K B U y 2 - R T € ; X j k V

a2;mM 2 Q H H B 7 2 K B M 2 - * B ` k y y d 2 b M M Q Q K b 6 A S 2 b i # 2 H 2 + 2 K [m K ; 2 M i 2 / 2 p 2 b 2 ` + T x / 2 ` 2 + Q # K m [M B H [2 B 2 M Q K i Q M B K Q - ` 2 b T Q M / + Q K m K K 2 M M Q 2 Q m M / 2 ` b Q Q K 2 M b ; 2 K ` 2 + 2 # B / M ½ Q T Q b b b 2 ` T

*QK # b2 M2bi2b iQb +QKmMB+ iBpQb- Q 6AS /2}MBm mK +Q BMi2` İ½Q- +QMbBbiBM/Q + / mK /2 mK b2[m2M+B /2 iQb +QKn İä2b KmHiB@K2Mb ;2Km i + Q K Q Q İ ½ Q X J T ` Q 2bi #2H2+BK2MiQ / +Q`/Qb 2 p€`BQb iBT Q 6 G 2 6 2 B A L 1 2 b * U A _1 c : _1 1 k y P P T.€; R9VX

h #2H 3 iQb +QKMB+ iBpQb 6AS' 2HH B/72KB/QX-6QM i2,2 :`2
 Uky y-dT€;X RNVX

6AS +QKKM MB+ iBp2 +i	@2b+`Bİ½Q	
+2Ti S`QT	Qb İ½Q /2 +2Bi` mK T`QTQbi T`2pB K2Mi2 bm#K2iB/ T`	
;`22	İ½Q /2 +QM+Q` /` 2K`2 HBx` H;mK İ½Q- TQbbBp2HK2	
* M+2H	İ½Q /2 mK ;2Mi2 BM7Q`K M/Q Qmi`Q ;2Mi2 /2 [m2 Q T`BK	
* HH 7Q` S`QT	Qb İ½Q /2 +QMpQ+ İ½Q /2 T`QTQbi b T` 2t2+mi` mK /2i2`K	
*QM}`K	P`2K2i2Mi2 BM7Q`K Q`2+2TiQ` [m2 mK / / T`QTQbBİ½Q ü	
.Bb+QM}`K	P`2K2i2Mi2 BM7Q`K Q`2+2TiQ` /2 [m2 mK / / T`QTQbBİ½Q ü	
6 BHm`2	İ½Q /2 /Bx2` Qmi`Q ;2Mi2 [m2 ?Qmp2 i2Mi iBp /2`2 H	
AM7Q`K	P`2K2i2Mi2 BM7Q`K Q`2+2TiQ` [m2 mK / / T`QTQbBİ½Q ü	
AM7Q`K A7	İK İ½Q K +`Q T` Q ;2Mi2 / İ½Q T` BM7Q`K` Q /2biBM	
AM7Q`K _27	İK İ½Q K +`Q [m2 T2`KBi2 Q`2K2i2Mi2 BM7Q`K` Q`2+2	
LQi IM/2`biQ	P`2K2i2Mi2 /Q iQ UTQ` BM7Q`K` Q`2+2TiQ` DVTQ`22t2KTHQ	
S`QT ; i2	P`2K2i2Mi2 i2K BMi2Mİ½Q /2 [m2 Q`2+2TiQ` i` i2 K2Mb ;	
S`QTQb2	İ½Q /2 T2`;mMi` Qmi`Q ;2Mi2 b2 mK /2i2`KBM / T`QTQ	
S`Qtv	P`2K2i2Mi2 /2b2D [m2 Q`2+2TiQ` b2H2+BQM2 ;2Mi2b /2 /	
Zm2`v A7	İ½Q /2 bm#K2i2` mK T`QTQbi T` 2t2+mi` mK /2i2`K	
Zm2`v _27	İ½Q /2 T2`;mMi` Qmi`Q ;2Mi2 T` Q Q#D2iQ` 272`B/Q T	
_27mb2	İ½Q /2`2+mb` 2t2+mİ½Q /2 mK /2i2`KBM / İ½Q- 2 2tTH	
_2D2+i S`QT	Qb İ½Q /2`2D2Bi` mK T`QTQbi /2`2 HBx İ½Q /2 H;mK İ½Q	
_2[m2bi	P`2K2i2Mi2 bQHB+Bi Q`2+2TiQ` [m2 2t2+mi2 H;mK İ½Q	
_2[m2bi q?2	MP`2K2i2Mi2 [m2` [m2 Q`2+2TiQ` 2t2+mi2 H;mK İ½Q [m M	
_2[m2bi q?2 p2`	M2@K2i2Mi2 [m2` [m2 Q`2+2TiQ` 2t2+mi2 H;mK İ½Q bb	
am#b+`B#2	P iQ /2 bQHB+Bi` mK BMi2Mİ½Q T2`bBbi2Mi2 /2 MQiB)+`	

eXjXk C"2? pBQm`b

p m+?2`k'y [GA61JAL1-2jyVX](#)

Ç aBKTH2"2? pBQm`+H bb2 #€bB+ bm#2biBK / [m2 pQ+ TQ/2
 p€`B b K M2B` b 2 [m2 KmBi b p2x2b + # TQ` b2` K2H?Q` b
 +QKTQ`i K2MiQb T`QKBbbQ`2b b½Q 2M+QMi` /Qb +QK H;mK
 *v+HB+"2?, pBQm+QKTQ`i K2MiQ T2`K M2+2 iBpQ 2M[m MiQ
 pBpQ 2 b2`€ +? K /Q `2T2iB/ K2Mi2 Tib + / 2p2MiQX JmBiQ
 `2+2Tİ½Q /2 K2Mb hBM5X`R23NjmbK mQKTQ`i K2MiQ +Q+HB+G
 T2`BQ/B+ K2Mi2 2t2+mi H;mK +i/B;Q /2}MB/Q T2HQ mbm€`B
 PM2a?Qi"2?, [ABDQ](#) 2t2+mi mK p2x 2 KQ``2 XXX L½Q û `2 HK2
 Q /BbT `Q TQ/2 b2` /BbT ` /QqMF2? Q2? p;B[Qm 2t2+mi H;mK
 +i/B;Q /2 mbm€`BQ mK p2x 2K mK [K2+2Bpiz](#) "2bTQ`BQm+Q
 /2b2M+ /2B [m M/Q mK /2i2`KBM /Q iBTQ /2 K2Mb ;2K û `2+2
 HBKBi2 2tTB` VX

*QKTQ`i K2MiQb +QKTQbiQb

S ` HH2H"2? pBQm`, +QMi`QH mK +QMDmMiQ /2 +QKTQ`i K2I
 2K T ` H2HQX P BKTQ`i Mi2 û +QM/Bİ½Q /2 iû`KBMQ, TQ/2KQ
 i2`KBM [m M/Q hP. a b +`B Mİ b 2bi½Q +QM+HmQ/ b- L +`B M
 ZI GZI1_ +`B Mİ 2bi€ +QM+HmQ/ X

a2[m2MiB H"2? pBQm`, 2bi2 +QKTQ`i K2MiQ 2t2+mi b2mb +
 mK Tib Q Qmi`Q 2 i2`KBM [m M/Q Q 9HiBKQ }H?Q i2`KBMQmX

eXjX*QMi` +i L2i

LQK2 /Q T /`½QMi` +iXL2i

[_272` M+B2H HB72KBM2- * B`Uky y-dT E, X QV-HB72KBUky-2i HX](#)
 T€;X jRVX

* i2;Q`BJ,`F2Xb

S`Q#H2Kk ;2Mi2 UQ BMBBiBQ[Q2m/2b2D i2` H;mK i`27 2t2+m
 TQ` mK Qm K Bb ;2Mi2b UQb_2bTB+M/T`MB2b/Q/2b2D QiBKB@
 x `mK 7mMİ½Q [m2 + ` +i2`Bx i`27 X 1bi 7mMİ½Q û +QK
 2t2KTHQ- +QKQ +mbiQ- i2KTQ iû +QM+Hmb½Q"-1/B@i`B#mBİ
[GA61JAL1c * A_1c :_11LkyPyX](#)

aQHmİ½Q, mK /2i2`KBM / i`27 - [m H[m2` M9K2`Q /2 T `iB+BT M
 /2` +QK mK T`QTQbi c Qb /2K Bb /2p2K `2+mb `X b M2;Q+B İ

6B;m` Re JQ/2HQ IJG / ?B2` `[m?Bp BX-Q-610 W122; HB72KBM2 2i
Ukyyk

Qb S `iB+BT Mi2b [m2 T`QTmb2` KX P AMB+TB QQQbQbB2-B
Qmi`Qb ;2Mi2b i` pûb / 2KBbb½Q /2 mK +QMpBi2`HF`2b2
7Q`S_PSPVa[ma2 2bT2+B}+ i`27 2 [m Bb[m2` +QM/Biä2b [m
bQ#`2 2t2+mï½Q / i`27 X

Pb T `iB+BT Mi2b [m2`2+2#2K Q +QMpBi2` T`2b2Mi i½Q /
TQi2M+B Bb +QMi` i /Qb 2 b½Q + T XMD / 2bT`QbimKXD.2K226
b½Q Q M9K2`Q /2 T`QTQbi b T ` `2 HBx ` i`27 - 2bT2+B}

T`QTQbi /Q S `iB+BT Mi2 BM+HmB b T`û@+QM/Biä2b [m
T ` i`27 - [m2 TQ/2 b2` Q T`2iQ- Qi2KTQ 2K [m2 i`27 b
iBp K2Mi2- Qb S `iB+BT Mi2b TQ/2K b2`2+mb ` T`QTQ`X
Q AMB+B /Q` p HB Q p HQ` `2+2#B/Q

S`QiQ+QHQB bbQ6-AS / QbQMi` 2i€L2ibQ+B /Q 2bi2 T /`½Q 2
`2T`2b2Mi /Q T2HX 6B;m`

P 6AS @*QMi` T+2@KLBi2 [AmBQ B2 MQ`B2*mKH 7Q`S`W*TCW H
mK +QMDm_MbQT QM/2` HB2 bm b T`QTQbi b 2- TQ` }K- `2 H
+2Bi M/Q mK / b T`QTQbi b Qm iû K2bKQ`2D2BJAM/Q2i iC
HXyykX

K2Mb ;2K *6S +QMiûK i½Q b2` `2 HBx / 2- b2 M2+2
2t2+mï½Q XbF Q MT Q`/2K `2bTQM/2` +QK b b2;mS`QI2@k2 Mb

6B;m` Rd S`QiQ+QHq /2 AMi2` İ½Q 6A"2 i0+ B7MiK BUK@y22 iHX QMi2
T€;X jeV

bm T`QTQbi +QKTQbi TQ` T`û@ +QM_2B7iãT2 B - `+2+mi Q 2@i 2Krt Q
LQi@IM/2`2KQ+QbQ /2 7 H? b /2 +QKmMB+ İ½QX

Tib p HB `iQ/ b b TAOMTBQB 2i Q+BX bm 2b+QH? 2 BM7Q`K [m
`2D2Bi / b 2 [m Bb 7Q` K +2Bi b U+i+2püS/ QKTQM b H22K bbBK
[m2 +QKTH2i K bm bi `27 b-A`27 QOKM b2KH+Q Q /2 bm İ½Q @ +Q
}M HBx / Qr6 BQXmQ2

P AMBiBT Q2 /2+B/B` + M+2H `Q T`QiQ+QHq*2 Mp 2VM2/b mK K2
/ İ½Q i2` bB/Q`2 HBx / 2 9HiBK K2Mb ;2K i2` bB/Q`2+2#B

P 6AS @*QMi` û+B@ I 2i2K2Mi /Q TQ` /QBb #Q MT`Q+ii L22 MMBi B @
iQ⁹*QMi` +iL2i_2bXTQM/BK2B`Q- im bQ# Q TQAM B i/B pB bi /Q
2 +mB/ /Q i2KTQ HBKBi2 /2 2bT2` / b T`QTQbi b dH H#K+F2 T`Qp
T` + / 2bi /Q /Q T`QiQ+QHqX PQ+MQ K F QL 2iK 2MTiQ Mb/Q #
Q TQMiQ /2 p 2bT QM/ 2` 2bTQM b€p2H T`BM+BT HK2Mi2 TQ`
bQHB+Bi / - 2MpB `T`QTQbi b Qm `2+mb `Q 2MpBQ /2 T`QTQ

JQ/2H ;2K,bi2 T /`½Q TQ/2 b2` `2T`2b2 RIX /Q T2H 6B;m`

⁹ ?iiT,ffd /2XiBH #X+QKf/Q+f TBfD /2fT`QiQf*QMi` +iL2iAMBiB iQ`X?iKH
⁸ ?iiT,ffd /2XiBH #X+QKf/Q+f TBfD /2fT`QiQf*QMi` +iL2i_2bTQM/2`X?iKH

6B;m` R3 S`QiQ+QHq /2 Bmi2` İ½Q 6A"SH*QBMi2K+BM2iX 6Q Mi2
2MrQ Qy-dT€;X kjV

AKTH2K2Mi İ½Q,2 /2KQMbi` `GAS`@QQMi` -+ü @2b2h` BiQ Q 2t2K
TH"QQF h` /BM;M2+B/Q T2H TH^eX nQ/Q bQ b1/2i H?2b / BKTH
i İ½Q- +QM};m` İ½Q /2 K#B2Mi2 2 T bbQb T ` 2t2+mİ½Q b
"XR

_ 272 ` M + B b

_h- *X p MBx iBQM H S`BM+BTH2b 7Q` X(m HXBH);2aMi`BM?
a+B2M+2 "mbBM2bb J2/B - kyy9X *Bi/k/92jRxp2x2b M b T€;BM

SSG1hPL-SXi2`Mb M/ bQ7ir `2, 1bb2MiB H +QM R2NNdXM/ i2
*Bi /Q M T€9BM

_:1Lh1- 1Xc CIGA L- oXc "PhhA- oX JmHiB@ ;2Mi bvbi2K /2p
QM Q`; MBx H2QM QMB+ LQi2b BM h?2Q`2iB +X R QK-TM X2j`- a+XB
88 dR- kyyeX AaaL R8dR@yeeRX S`Q+22/BM;b Q7 i?2 6B`bi
*QQ`/BM iBQM M/ P`; MBb iBQM U*QP`; kyy8VS`Q+22/BM;b
qQ`Fb?QT QM *QQ`/BM iBQM M/ P`; MBb iBQM U*QP`; kyy8V
l?iiT,ffrrrXb+B2M+2/B`2+iX+QKfb+B2M+2f `iBX+H*BiT/BQ Ma R8d
T€;BM

o:1_API- SXc w.lL- IX `+?Bi2+im`H T ii2`Mb `2pBbBi2/ T ii
p2x2b M b T€2BYX b

" CP- CX 2i HX HQr@H2p2H `2bQm`+2 HHQ+ iBQM BM M ;
TH i7QT XHB2/ aQ7i *QKT 3BMX dRe dk3- kyReX AaaL R8e3@
2KJ?iiT,ffrrrXb+B2M+2/B`2+iX+QKfb+B2M+2f `iBX+H*BiT/BQ fa R
M T€;BM

"11.G1- JX 2i HX a+`mK, M 2ti2MbBQM T ii2`M H M;m ;2 7Q`
/2p2HQT 2iM XM G M;m ;2b Q7 S`QX X - T XBe;jM e8R- RNNNX *E
T€;BM

"1GGA61JAL1- 6X 2i HX C /2 T`QC` / X p2` bBXMBk2yX .BbTQM
2KJ?iiT,ffD /2XiBH #X+QKf/Q+fT`QX KKi2/Q; RjB p2X2b7M b T€;
RjjNeyekeje9eee3eN2dX

"1GGA61JAL1- 6X GXc * A_1- :Xc :_12pL2HPTBM; KmHiB@ ;2Mi
rBi? C X1(aXHx), CQ?M qBH2v aQMb- kyydX pX dXR j*FB8 /Q RR
jd-eyeReke8eeede32dX

"APG*>ALA- CX 2i HX avbi2K iB+ `2pB2raBM i2Q 7iM; B M 2/2 BMM2
M/ *QKTmi2` a+B2M+2 .2T `iK2Mi *PSS1fl6 _G-ph2e d M-BM XHy_82
TX 98- kyy8X *Bi /Q j p2x 2b 9M2B X€;BM b

"PLAh aP6h#Qmi "QMBiX (S XMX)- kyReX .BiTQ,MfQpr2H 2K,
#QMBi bQ7iX+QKfT`Q/m+ibOX#QBii @#M M B X B M TK =

"la*>J LL- 6Xc >1LL1u- EXc a*>JAShii2XM @ Q`B2Mi2/ bQ7ir `2
`+?Bi2+im`2- QM T ii2`Mb MX T(aXHM) HCMQ;?M;2BH2v bQMb- h
*Bi /Q k p2x2b M b N2jyXBM b

* A_1- :X C /2 T`Q;` KKBM; imiQ`Bh AG7 Q` #a21; BM yN2Xb XBi /Q 9
p2x2b M b T€j;BM13Bj NX

*> *PL- aXc ah_ l"S "Q XB(aXHx), T`2bb- kyR9X 9YBi /Q M T€;E

*>1L- sX _2b2 `+? QM ;`B/@b2`pB+2 # b2/ pB`im H T`Q/m+ib 2tT;
bmTTQ`iBM; `+?Bi2+im`2 BM 2 @+QkYk`A Mi2`TMH BB-QiB QM`bQMA7M;2
QM 1@"mbBM2bb M/ AM7Q`K KB(QM H a X b b2XMa2)+rkyBNX TX R 8X *
T€;B8X

*>1L- uXc sA P- sXc aPL:- uX _2b2 `+? QM i?2 #B//BM; BM7Q`K iB
Q7 ;2M2` iBQM k`yQb AXMA2MM iBQM H a2KBM `QM "mbBM2bb M/
J M ;2KXM(aXHX, bXMX)- kyy3X pX k- TX k8Xkk3X *Bi /Q M T€;B

. J- EX >X p Mc GIEawP- wX JQ/2HHBM; 2M2`;v M/ i` MbTQ`i BM
KmHiB@ ;2Mi bvbi2K mbBM; ;2M2` B+1QMAI Q H2QM XBAQM H *QM72`2
avbi2Kb- J M M/ *v#2`aXHX, bXMX)- kyyeX pX R- TX 38X 3N8X *B

.1"A LX#Qmi .2#kYReX .BbTQM i Q T p 2 H f2 Kr, X/2# B M X Q`;fXMi`Qf #Qr
*Bi /Q M T€;BM

.1l:P- .Xc q1Aaa- JXc E1L. GG- 1X _2mb #H2 T ii2`Mb 7Q` ;2Mi +
*QQ`/BM iBQM Q7 AM(2`XH2X);;2M`iBM;2`-kyyRX TX j9d8X 3X *Bi /O

1*GASa1 6PIL. hA>2LHT @ 1+HBTb2 SH i 7Q`KkyR?eXBB b1T`QI Q p 2H
2KJ?iiT,ff?2HTX2+HBTb2XQ`XfMBQMQBM/29XBM T=

6AGAS1- CX "X GXc 6_1.- X GXLX *QHH2+iBp2 ;2Mib M/ +QHH2+
2/ KQ/2HkYAMaBti? J2tB+ M AMi2`M iBQM H *QM72`2M+2 QM `iB
aT2+B H a2bbB QMaUKJAX, bXMX)- kyydX TX kRR8XkyX *Bi /Q M T€

6PLa1* - CX CX aX /X J2iQ/QHQ;B / 6TQ`b [H B b ;- H B 2 M 8 Q]8- X
kyykX *Bi /Q M 9X€;BM

: "_A1G- X 2i HX JmHiB@ ;2Mi bvbi2K iQ bmTTkQRi8+R2R iBp2 rQ`F
AMi2`M iBQM H *QM72`2M+2 QM aB;M H@AK ;2 h2+?MQHQ;v AMi
(aXHX, bXMX)- kyR8X TX eNj 8X dX *Bi /Q M T€;BM

: JJ - 1X.2bB;M T ii2`Mb, 2H2K2Mib Q7 `2mb #X2(Q#BX);i@Q`B2M
S2 `bQM 1/m+ iBQM AM/B - RNN8X *BR ;RQ8k-p 22 29X M b T€;BM b

:AG- X *X *QKQ 2H #Q` `T`Q Da2%QbS/2pTQb {T B be R- kyykX *Bi /Q
p2x2b M b T9 2B X b

:AG- X J`XiQ/Qb 2 iû+MB+ b /2 TX2(p`XHBX),bQH B-Hkyy3X pX eX *Bi
T€;B8X

:Ah>l"XBi>X#kyReX .BbTQM i Q T p 2 H f2 K j ? m #X +`BK f/Q M T9X BM

:_11L- aX 2i HX aQ7ir `2 ;2M2`b,`iK2MB Q X *QKTmi2` a+B2M+2- h`
*QHH2;2 .m#HBM- h2+?X _2T R M Na d @ *ã R/Q N W j Q T y e; BM

:_Aaa- JX GX aQ7ir `2 ;2Mib b M2ti;2M2` iB`QNK T Q Mi2 M 2 @+ # K T /Q M
bQ7ir `2 2M;BM 2B b Q M ;@q2bH2v- TX e9R e8d- kyyRX *Bj /Q j p2x2
kd2k X

>P L:- hX hX >Xc P**1GGP- JXc C JPLh- CX SX ;2M2`B+ `2+m`bE
KQ/2H iQ bBKTHB7v H `;2 b+ H2 KmHiB @HyR2A b1bfQ K bf Q #b2`p i
AMi2`M iBQM H *QM72`2M+2b QM q2# AMi2HHB;2M+(2XMX, AMi2HH
bXMX)- kyRRX pX k- TX R88 R 8 X *Bi /Q M T€;BM

C .1X C p ;2Mi /2p2HQTk2Mi 7` K2rQ`FX 7ij R, fXD. B b X QBMHQ#2 H
+ Q K f= *Bi /Q M Tj €; BM

C1LLAL:a- LX _X PM ;2Mi@# b2/ bQ7iB} 2B2 M; BM 221HBH p2M+2
pX RRd- MX k- TX kdd kNe- kyyyX *BiR/jQkX p2x2b M b T€; BM b

C1LLAL:a- LX _Xc qPPG._A.:1- JX CX aQ 7iir2` 2BT2X R db Ky- RNNe
*Bi /Q k p2x2b M bj 2€; BM b

CP>LaPL- _X 2i HX .2bB;M T ii2`Mb, 1H2K2Mib Q7 `2mb #H2
"QbiQM- J bb +?mb2iib, -/RBNQ8X @*d2ib HQ yk XT€; BM

CILAP_- :X "X /X aX 2i HX S /`ä2b `[mBi2im` Bb T ` Q /2b2Mj
KmHiB ;2Mi2X IMBp2`bB/ /2 62/2` H /Q J ` M?½Q- ky yjX *Bi /
kj- k828 X

EAh*>1L> J- "X S`Q+2/m`2b 7Q` T2`7Q`KB 22H2i2E-iB22`H2pB
IMBp2`bX vj- MX kyy9- TX R ke- kyy9X9 X Bi /Q M T€; BM

EPGS- JXc :AP_:ALA- SXc JuGPSPiGPa- CX P`; MBx iBQM H Kr
KQ#BH2`Q#Qi 2t KT 2Q+2M/BM; X Q7 i?2 }`bi Bmi2`M iBQM H
QM miQMqKQmb ;2Mib M/ KmHiB (2MHXyb k2yk XTT Xi R9 N8X
T€; BM

EPGS- JXc :AP_:ALA- SXc JuGPSPiGPa- CX JmHiB@ ;2Mi `+
Q`; MBx iBQM H mi`Qm Qm Qm X ;2Mib M/ JmHiB @ B2M2`a-vpX2Rj
MX R- TX j k8- kyyeX *Bi /Q j p2x2b 2B3X b T€; BM b

EPaEAJA1aS Ei2`M JBMBM; M/ S ii2XMyGyB X2. @ bT-QM2Qp2H 2K,
I?iit,ffrrrX+bXimiX7Bf Q? `faHB/2bkyyXfGrB2MQQk8p2H2yj MX bi
T€; BM j28 X

G h1sX/Q+mK2Mi T`2T ` i X Q MRbvXi Bk TQM Q T2 H f2Kj;2t @ T` Q D2
Q`; fX *Bi /Q M T9€; BM

G1aa1_- oX _X *QQT2` iBp2 KmHiB ;2Mi bvbi2Kb, T2`bQM H
A111 h` Mb +iBQM b QM FMQRH2/;2- M1/11+ p2MRBM 22X BM;TX Rjj
RNNNX *Bi /Q M X T€; BM

GAI- ZXc *IA- sXc >I- sX *QM~B+i`2bQHmiBQM rBi?BM KmHiB
/2bB;M XyAm, AMi2`M iBQM H *QM72`2M+2 QM *QKTmi2` a+B2
1M;BM2X (BMHX, bXMX)- kyy3X pX R- TX 88X 8kjX *Bi /Q M T€

J GPL1- hX qX P`; MBxBM; BM7Q`K iBQM T`Q+2bbBM; bvbi2K
Q`; MBx iBQM b M/ +QK*Qm 2B iBQM 2-K*QK Tmi iBQM MH2QQT2`
LQ`rQQ/- LC- TX 8e 3j- RNNyX 8*Bi /Q M T€; BM

J haPL- 1X hX 1K#2//BM; BMi2HHB;2Mi ;2Mib iQ 2M #H2 T?vb
Q`; MBx iBQM b XA1M,1 AMi2`M iBQM H avKTQbBmK QM *QKTmi
_Q#QiB+b M/ miQK iXQ (MX @ X, *AX MX)- kyyNX TX jyN 8j X *Bi

J* _h>l_- aX .X 2i HX JmHiB@ ;2Mi bvbi2Kb 7Q` TQr2` 2M;BM2
B, *QM+2Tib- TT`Q +?2b- M/ i2A?1M B+ Mb+ ?iB Q 2M; QMXSQR2` b
A111- pX kk- MX 9- TX Rd9j Rd8k- kyydX *Bd2kQ k p2x2b M b T€

J1_*A1_- Xc P**1GGP- JXc C JPLh- CX SX IbBM; KmHiB ;2Mi b2H
i2+?MB[m2b iQ BKT`Qp2 /vM KB+ bFBHH b2 `+?BMk BMypB`im H b
kkM/ A111 AMi2`M iBQM H *QM72`2M+2 QM hQQ(HaX HBKi,?bXiNB X}B H
kyRyX pX R- TX 93R 939X 8Xi /Q M T€;BM

LA*EG1a- JXc _Po haPa- JXc q1Aaa- :X 1tT2+i iBQM@Q`B2Mi2/
1M;BM22`BM; TTHB+ iBQMb Q7 pX ER}3-BM+ BMi2Xi BIR2MN23- kyy8
AaaL yN8k@RNdeX .BbitTQ,MfQp2Hb 2K2 M+2/B`2+iX+QKfb+B2M+2f`
ayN8kRNdey8xyyBIR/Q M T€;BM

S S11_A SXT22`B , QMHBM2 XgklyRse X/BB QT QIM Q T H f2 Kr,X
T T22`B XXQ*Bi=/Q M T€;BM

S _aA6 SX`7Q`K avbi2K iB+ GBiX`kiyR2X_2P B2 QIM Q T H 2K,
fft `bB7X HB+ /Q M T€;BM

S1L:- sX ?X 2i HX aim/v QM +QQT2` iBQM K2+? MByKeBM ;2Mi Q
AMi2`M iBQM H *QM72`2M+2 QM J +?BMX (aX HMB MX MM)-*k#2èM 2T
Nye NRyX *Bi /Q 8X T€;BM

S_P. LPo- *X *Xc 6_1Ah a- J2X QXQ H Q;B /Q h` # H?Q *B2MiQ}+Q, J
hû+MB+ b / S2b[mBb 2 /Q h` # H?QX+(aX HBK)Q @BYQ1/B22Q H2- ky
*Bi /Q k p2x2b M 9j2€9BM b

_A*> _a- JX aQ7ir `2 `+?Bi2+Prö`2 BHiH2`M2R8 X *Bi /Q k p2x2b
M b T€;Bj2kx

_l"AL- EX1aX2MiB H a+`mK, T` +iB+ H ;mB/2 iQ i?XK(Q)HXQ,TmH
//BbQM@q2bH2v- kyRkX 9BX /Q M T€;BM

a*>q "1_- EXc alh>1_G lh.?2Ca+`mK :mB/2 h?2 /2}MBiBp2 ;mB/2 iQ
h?2 `mH2b Q7 i?2 ;Xkz RkX RBVTQIM Q T H f2 Kr,Xb+`mK;mB/2bXQ`;f
/Q+bfB+`mK;mB/2fpkyRefkyRe @ax`hBK @QmB/2€;BM T/7=

a1GE1_- hX *Q +?, i2 +?BM; ;2QIK K?mMB2+`im QXm b-Q7Ji-?2 *J
pX jd- MX d- TX Nk NN- RNN9Xk*Bi /Q M T€;BM

a1__ LP- J2b2MpQHpbK2MiQ AMi2M+BQM H /2 aQ7ir `2 h` MbT`
`;mK2MiXi2b2 U.QmiQ` /QV SI* @ _BQ- kyRRX *BR j2QX p2x2b M

a> q- JX aQK2 T ii2`Mb 7Q` bQ7ir S2ii2+MBH2Mi; m`22bX Q7 T`Q;` K
/2bB;MX k- TX k88 keN- RNNeX *Bi /Q 9j2j2x M b T€;BM b

aAGo - _X JX /X Zm HB/ /2 M KQ/2H ;2K /2 T`Q+2bbQb /2 bQ7ir `2
T€;Bj2x

au* _ - EX SX JmHiB ;2MAkvbix2BpX RN- MX k- TX dN- RNN3X *Bi
p2x2b M b T€;Bj28j

h_1GGaQ#`2 Q X 2BXHX)- kyRdX .BbitTQ,MfQp2Hb 2K2 X X QKfiQm`=
*Bi /Q M T€;BM

hIL: .P- hXc 6 IGEL1_- aXc EPGS- JX P`; MBx iBQM H KmHiB@ ;2M
BM7Q`K iBQM bAb12AbX(X AMHX, bXMX)- kyyjX TX 3N 3N X *Bi /Q M

ILG L.-_X 2i HX 2;Bb, ;2Mi Q`B2Mi2+Qm MMBM; iBQM b2K2Mi
AM7Q`K iBQM h2pXMBQ MQ; B-2TX RjN Rek- RNN8X AaaL yN8N@
I?iit,ffrrrXb+B2M+2/B`2+iX+QKfb+B2M+2f`iX+HBifTQBMyN8N
T€;B8X

oGA1h->X oXc oGAa1Ch7iC X2oXM; BM22`BM; , T`BM+(B XH2b), MB FT2
L2r uQ`F- kyydX pX jX *Bi /Q k p2N2y XM b T€;BM b

q1Aaa- :X *QKTmi iBQM H Q`; MBx iBQM HiB2 Q`MX aMb; 2Kb,
JQ/2`M TT`Q +? iQ .Bbi`B#mi2/ `XBj AB Sf 2Abi-2HyHy X2MX 2NN
Aa"L Nd3ykekk8dR3jX .BbTQ, MiBp22H 2TK, Q`2XB222XQ`;ftTHf`i
`MmK#2`4ekX9eB8=/Q M T8X, BM

qPPG._A.:1- JM BMi`Q/m+iBQM iQ KmXi(B X 2M), bQ Qi2NK b BH2v
kyyNX *Bi /Q 9 p2x2b ky kb R 32, kBM b

qPPG._A.:1- JXc C1LLAL:a- LX _X AMi2HHB; 2Mi ; 2M?2, h?2Q
FMQRH2/; 2 2M; BM22`BM; B/2; pB 2MrBp S`2bb- pX Ry- MX yk- TX R
*Bi /Q M T€;BM

qI- EXc .I L- *Xc a>A- ZX JmHiB@ ; 2Mi # b2/ TQR2` ; `B// i BM
TH i7Q`KXyAMA Mi2`M iBQM H *QM72`2M+2QM `iB}+B H AMi2
AMi2HHB(2XH+2, bXMX)- kyyNX pX 9- TX R83 R33X *Bi /Q M T

sA L:- uXc > La> _- 6X *QKT `BbQM Q7 iB;?iHv M/ HQQb2Hv
T` /B; Kb BM KmHiB ; 2MiMi2T 2/ B BQMM CQm`M H Q7 TT`QtBK
pX 8R- MX 8- TX eyy eRj- kyRyX AaaL y333@eRjsX S:J@kyy
I?iit,ffrrrXb+B2M+2/B`2+iX+QKfb+B2M+2f`iBXH2BTBQMy333
T€;B8X

w J"PL1GGA- 6Xc C1LLAL:a- LX _Xc qPPG._A.:1- JX P`; MBb i
7Q`i?2 M HvbBb M/ /2bB; M Q7 KmHiB@ ; 2M2Miv@ Q`KB2MA2M, a
bQ7ir`2 2M; 2M2X HBM; kyyRX TX kj8 k8RX *Bi k/jQ R 2j 2X 2b M b

T M / B + 2 b

S L.A * 1 S` QiQ + QHQ / 2 a B b i 2 K € i B +

XR h2K

P Q # D 2 i B p Q / 2 b b ` 2 p B b 1/2 Q b B b i 2 K € i B + û B / 2 M i B } + ` K Q
+ B Q M B b T ` b B b i 2 K b K m H i B ; 2 M i 2 b X h B b K Q / 2 H Q b b 1/2 Q p B
` [m B i 2 i m ` B b T ` a J X

Xk S` Q # H 2 K

L 1/2 Q 7 Q ` K 2 M + Q M i ` / Q b 2 K T 2 b [m B b b T ` 2 H B K B M ` 2 b T 2 H
K Q / 2 H Q b ` [m B i 2 i m ` B b T ` a J 2 [m 2 i ` i 2 K Q M Q p 2 H Q ` ; M B x -
M 1/2 Q b 1/2 Q K m B i Q # 2 K + Q M ? 2 + B / b b + ` + i 2 ` Q b i B + b / 2 b i 2 b K

XkXR Zm 2 b i ä 2 b / 2 T 2 b [m B b

a 2 ` 1/2 Q B M p 2 b i B ; / b b ` 2 b T Q b i b T ` b b 2 ; m B M i 2 b [m 2 b i
R X m B b b 1/2 Q Q b K Q / 2 H Q b ` [m B i 2 i m ` B b / 2 M Q p 2 H Q ` ; M B x -
k X m B b b 1/2 Q b + ` + i 2 ` Q b i B + b / Q b K Q / 2 H Q b ` [m B i 2 i m ` B b

XkXk A M i 2 ` p 2 M i 1/2 Q

a 2 ` 1/2 Q Q # b 2 ` p / Q b K Q / 2 H Q b / 2 ` [m B i 2 i m ` / 2 a J [m 2 b 2 2
i m ` b Q ` ; M B x + B Q M B b X

XkXj S Q T m H i 1/2 Q

• ` 2 b / 2 T H B + i 1/2 Q 2 T 2 b [m B b / 2 a J b 2 ` 1/2 Q Q # b 2 ` p / b / m

XkX9 * Q M i ` Q H 2

P + Q M D m M i Q / 2 / / Q b B M B + B B b m i B H B x / Q b b 1/2 Q ` i B ; Q
Q # D 2 i Q / 2 2 b i m / Q - b 1/2 Q 2 H 2 b ,

Ç P` ; MBx iBQM H JmHiB@ ;2Mi `+?Bi2+im` 2u1zQ`PaM7Q`K iB
6 IGEL1_c EP-@SyVc

Ç P` ; MBx iBQM H KmHiB@ ;2Mi `+?Bi2+im` 2FbGS dKQ#Fb_H@ `Q#Q
:ALAc JuGPSP+@PykX

XkX8 _2bmHi /Qb

1bT2` @b2 Q#i2Mİ½Q /2 KQ/2HQb `[mBi2im` Bb Q` ; MBx +
D K TQi2M+B HK2Mi2 +H bbB}+€p2Bb +QKQ T /`ä2b `[mBi2im` B

XkXe THB+ İ½Q

a2`½Q #2M2}+B / b €`2 b /2 THB+ İ½Q /2 aJ c 2bT2+B}+ K2
/2b2MpQHpbK2MiQ /2 bQ7ir `2 miBHBx M/Q +QKQ `[mBi2im` 2bi

XkXd S H p` b@+? p2 2 bBM-MBKQb

6Q` K +QMbB/2` / b +QKQ bBM-MBKQb bób2ñ mIB@2;2 MiH p`
avbi2KôJmHiB ;2Mi @vPb;2M b iBQM 2öPñ+iMBxó iBQM Xi`m+im` ô
b /2K Bb T H p` b +ó?`p2 Bİ2Qim` X ii2`Mô

Xj a2H2İ½Q /2 7QMi2b /2 T2b[mBb

XjXR *`Biû`BQb T ` b2H2İ½Q /2 7QMi2

Pb b2;mBmi2b +`Biû`BQb 7Q` K /Qi /Qb T ` b2H2İ½Q / b 7Q

RX2Mi`2 b €`2 b /2 /QKQMBQ / b 7QMi2b /2 T2b[mBb /2p2`½Q b
*QKTmi İ½Q Qm 1M;2M? `B /2 aQ7ir `2c

kXPb `iB;Qb /2p2`½Q 2bi ` /BbTQMqP2Bb ;` imBi K2Mi2 Qm b 7
MB / b +QK IM"c

jX.2p2 /BbTQMB#BHBx ` Qb `iB;Qb 2H2i`QMB+ K2Mi2c

9X2p2 +QMi2` `iB;Qb 2K BM;H b 2 TQ`im;m bX

XjXk GBbi /2 7QMi2b /2 T2b[mBb

b 7QMi2b /2 T2b[mBb /Qi / b b½Q,

RX111 *QKTmi2` a+B2M+2 R;B;Bi H GB#` `v

R ?iiT,ffB222tTHQ`2XB222XQ`;

kXa+B2M+2^kXB`2+i

X9 a2H2İ½Q /2 i` # H?Qb

X9X Ri` BM2bT 2b[mBb

bi`BM;T2b[mBb 7QB b2;mBMi2,

óJmHiB ;2Mi avbi2Kô L. UóP`; MBx iBQM ai`m+im`2ôP_ óP`;

X9Xk *`Biû`BQb /2 BM+Hmb½Q

a2`½Q /Qi /Qb Qb b2;mBMi2b +`Biû`BQb T ` BM+HmB` `

RXP `iB;Q /2p2 b2` 2b+`BiQ 2K BM;H b Qm TQ`im;m bc

kXP `iB;Q /2p2 2bi` /BbTQMqp2H 2K K2BQ 2H2i`→MB+Qc

jXP `iB;Q /2p2 T`2b2Mi` MQ KQMBKQ mK KQ/2HQ `[mBi2i

aJ /2b+`2p2M/Q bm b + ` +i2`QbiB+ b /2 7Q`K 2tTHQ+Bi c
2tT2`B M+B b +QK i Bb KQ/2HQbc 2fQm +QKT ` ` KQ/2HQb

X9Xj *`Biû`BQb /2 2t+Hmb½Q

a2`½Q /Qi /Qb Qb b2;mBMi2b +`Biû`BQb T ` 2t+HmB` `i

RXP `iB;Q M½Q #Q`/ aJ c

kXP `iB;Q M½Q #Q`/ `[mBi2im` b /2 aJ c

jXP `iB;Q M½Q #Q`/ Q MQp2H Q`; MBx +BQM H / `[mBi2in

9XP `iB;Q M½Q b2 T`QTä2 /2b+`2p2` mK T /`½Q `[mBi2im
aJ c

8XP `iB;Q M½Q T2`i2M+2 Q /QKQMBQ / +QKTmi İ½Q Qm 2M

eXP `iB;Q M½Q 2bi€ /BbTQMqp2H T ` +2bbQ ;` imBiQ TQ`K

^k ?iiT,ffrrrXb+B2M+2/B`2+iX+QKf

X9X9 S`Q+2/BK2MiQ T ` b2H2İ½Q /Qb i` # H?Qb

Pb +`Biû`BQb /2 BM+Hmb½Q 2 2t+Hmb½Q b2`½Q THB+ /Qb 2
`iB;QbX L T`BK2B` 2 b2;mM/ 2i T b- Q `iB;Q TQ/2 b2` b2H2+B
i2`+2B` 2i T - Q `iB;Q TQ/2 b2` /2 /2b+ `i /Q Qm- TQ` }K- +2BiQX
Qb +QMi29/Qb b2`2K HB/Qb 2K + / 2i T ,

RÝ 2i T , iQimHQ- `2bmKQ 2 T H p` b@+? p2c

kÝ 2i T , BMi`Q/mİ½Q 2 +QM+Hmb½Qc

jÝ 2i T , iQ/Q Q +QMi29/QX

X8 *QH2i /2 / /Qb

Pb `iB;Qb `2iQ`M /Qb /2p2`½Q b2` + iSHQ;B/7QbM`B72`M K2Mi
b2İ½Qk X-3 Xk /2 7 +BHBi ` b2H2İ½Q /Qb K2bKQb- M€HBb2 /Q +C
BM7Q`K İä2bX

S L.A * 1 " AKTH2K2Mi i 1/2 Q
` [mBi2im` Bb Q` ; MBx +BQ

"XR *QMi` +i L2i

"XRXR *QMi2tiQ

P 2t2KTHQ b2;mB` # b2B @b2 M p2M/ 2 +QKT` /2 HBp
/Q`2b UBMbi•M+B Q/F a2HBM22 ;2MMi2b +QKT` /Q`2b UBMbi•M+
"QQF"mv2`Vx2Mi

aQ# T2`bT2+iBp /Q ;2Mi2 +QKT` /Q` - 2bi2 `2+2#2 Q iQ
T` /Q +QKQ mK ` ;mK2MiQ 2K HBM? /2 +QK M/Q 2 bQHB+Bi
;2Mi2b p2M/2/Q`2b [m2 Q72`2i K mK Q72`i X bbBK [m2 mK Q
+QKT` /Q` +2Bi 2 2KBi2 mK Q`/2K/2 +QKT` X a2 K Bb /2 mK
mK Q72`i - Q +QKT` /Q` +QKT` Qb T`2iQb 2 `2 HBx +QKT
h2M/Q +QKT` /Q Q HBp`Q- Q ;2Mi2 /Q +QKT` /Q` i2`KBM X

aQ# T2`bT2+iBp /Q ;2Mi2 p2M/2/Q` - 2bi2 TQbbmB mK B
"QQFa2HBM`:[mBH Q mbm€`BQ TQ/2 BMb2`B` MQpQb iQimHQb
Q`2+2#2` bQHB+Bi ä2b T ` 7Q`M2+2` mK T`QTQbi T ` mK
Q iQimHQ bQHB+Bi /Q- TQ/2M/Q`2bTQM/2` +QK Q T`2iQ + bQ
mK T`QTQbi + bQ M1/2Q Q TQbbm X 1K + bQ /2 2MpB ` mK T
`2+2#2` mK Q`/2K/2 +QKT` - Q HBp`Q û p2M/B/Q 2 `2KQpB/Q

"XRXk S`2T ` i 1/2 Q /Q K#B2Mi2

P 2t2KTHQ 7QB `Q/ /Q 2K bBbi2K QT2` +BQM H I#mMim
1+HBTb2 L2QM p2`b 1/2Q 9XeXjX Pbb2;mB Mi2b T bbQb /2p2K b2`

R X 2 HBxQRmH/Q /` [mBp/Q H2KxiBT,ffD /2XiBH #X+QKf/QrMH
2 /2b+QKT +i€@HQ- #2K +QKQ /2b+QKT +i ` b T bi b [m2
K2bKQc

kX1/Bi ` Q `[X#pQ S` BbbQ- 2t2+mi M QM+QX#M/2B +BQM ` b
HBM? b # BtQ Q }M H /Q `[mBpQ 2- TQ` }K- b Hp ` 2/Bi 1/2

R 8HiBKQ +2bbQ DmM?Q kyRd

"XRXj *HQFa2HH2` ;2Mi

S ` +`B ` mK ;2Mi2 C .1- /2}M2@b2- # bB+ K2Mi2- mK bm
D /2X+Q` 2Xm;2BiKTH2K2Mi @b2imTUV /QKTQ`i K2MiQb /Q ;2Mi
SQ` K2BQ / +H bb2 D /2X+Q` 2X ;2Mi- Qb ;2Mi2b TQ/2K`2 HBx`
i 7Q`K +QKQ`2;Bbi`Q- +QM};m` ĩ½Q- 2i`Q+ /2 K2Mi2m-TUVbX i`
mK ;2Mi2`2;Bbi` b2mb b2`pBİQb M b T€;BM b K`2H b 2 /B+BQ

AMB+B HK2Mi2- +`B @b2 mK + i€HQ;Q /2 HBp`Qb 2 B Mi2`7
K2bKQb i` pûb /"HQFa2HH2`:mB

jd Tm#HBH b'QQFa2HH2`2;2M/b;2Mi &
j3 ff h?2+ i HQ;QZ#QQ7Q`b H2K Tb?2iBiH2Q7 #QQiQBibT`B#2
jN T`Bp i2 b?i #H2 + i HQ;m2c
9y ff h?2IA#vK2 MQ7r?B+i??2mb2+ M// #QQBM?2+ i HQ;m2
9R T`Bp i2QQFa2HH2`:mB Kv:mBc
9k
9j ff Smi;2MBMBiB HBx i2Q2Mb
99 T`Qi2+i2QBb2imTUV &
98 ff *`2 i2i?2+ i HQ;m2
9e + i HQ;m2i2> b?i #H2UVc
9d
93 ff *`2 i2 M/b?Qir?2:IA
9N Kv:mBM42r'QQFa2HH2?BMBU
8y Kv:mBXb?Qr:mBUVc

1K b2;mB/ - `2;Bbi` @b2 Q b2`pBİQ /2 p2M/ /2"QBp`@b UmK
b2HMBMBb T€;BM b K`2H b T` [m2 2bi2D /BbTQMqp2HT` Qmi`
b2mb b2`pBİQb- mK ;2Mi2 /2p2 B Mb+B222i`@b 26M+QH;2iMi2`.6;2Mi
.6`2mM2 2 bbQ+B /2b+`Bİä2b /2 b2`pBİQ Qb2Mi2mAb 2M2BMi2`}
/2 KQ/Q [m2 Qb ;2Mi2b pBbBi Mi2b TQbb K +QMi +i€@HQ`T`Q+r
Qb b2`pBİQb /2 [m2 M2+2bbBi KX

P T /`½Q 6AS 2bi #2H2+2 [m2 + / BMbi•M+B /2 ;2Mi2 û B/2
U;2Mi A/2M2B)2`TH i 7Q`K C .1- mK A. û mK B Mb i2X+BX/X+H. bb2
1bi T`Qp Q K;2iiQAQU M2`2iQ`M Q MQK2 ;HQ# H /Q ;2Mi2 M TH
b2;mB Mi2 7Q`K i2nHQ+ H=!IMQK2 @TH i 7Q`K =

P ;2Mi2 /2p2- TQ`i MiQ- 7Q`M2+2` b2m A. 2 mK HBbi /2 b2r
i` pûb /2 mK /2b+`Bİ½Q /2[m / - +QKQ mK BMbi•M+B / +H bb2

k ?iiT,ffD /2XiBH #X+QKf/Q+f TBfD /2f+Q`2f ;2MiX?iKH U9HiBKQ +2bbQ Dm
j ?iiT,ffD /2XiBH #X+QKf/Q+f TBfD /2f/QK BMf6AS ;2MiJ M ;2K2Mif.6 ;2Mi.
iBKQ +2bbQ DmM?Q /2 kyRdV

2- Q }M H- BMpQ+ ` Q K2i; Q bQ22 UME iBb+Q. 6 a`X` pB+2

8k ff _2;Bbi2?2#Q @F2HHBM; pB-BM?2v2HHQr;2b
 8j .6 ;2Mi.2b+`BTiBQM 2/76 42Mi.2b+`BTiBQMUVc
 89 /7/Xb2iL K2U;2i A.UVVc
 88 a2`pB+2.2b+`BTiBQM 2/76 42Mi.2b+`BTiBQMUVc
 8e b/Xb2ihv jF2U@F2HHBMc;
 8d b/Xb2iL K2U@Q@F /BMjVc
 83 /7/X //a2`pB+2bUb/Vc
 8N i`v &
 ey .6a2`pB+2X`2;B Bi2 /U/Vc
 eR '
 ek + i+?U6AS 1t+2TiBQM 72V &
 ej 72XT`BMiai +Fh` +2UVc
 e9 '

SQ` }K- BM/ MQb2ûmTUV /B+BQM /Qb Qb +QKTQ`i K2M
 /2K "b +QMbmHi b /Qb ;2Mi2b +QKT` / Q`22b U [im 2bib2a Q+H2 bb
 +QKTQ`i K2MiQb [m2 i2M/2K "b Q`/2Mb /2 +QKT` /Qb ;2Mi2b
 +H bSrn2`+? b2P`/2 Vba2`p2`

ee ff // i?2#2? pB Qm`pB Mm2`B ZbQ #mv2;2Mib
 ed //"2? pBQM 2/76 42Mi.2b+`BTiBQMUVc
 e3
 eN ff // i?2#2? pB Qm`pB Mm2`+? Q2/2` B`Q #mv2;2Mib
 dy //"2? pBQM 2/76 42Mi.2b+`BTiBQMUVc
 dR '

HûK /Q KûiQ/iQ-TUVH bb2 TQbbmB FQ KûiQmQ û BMpQ+ /Q
 BK2/B i K2Mi2 Mi2b /2 mK ;2Mi2 i2` 2M+2`` /Q b2mb b2`pBïQ
 p€`B b QT2` ä2b /2 HBKT2x X

dj ff Smi;2M+H2 @MTQT2` iBQM b2
 d9 T`Qi2+ipQB/ F2.QrMUV &
 d8 ff .2`2;BbiZ`QK?2v2HHQr;2b
 de i`v &
 dd .6a2`pB+2X/2`2;B BV2` U
 d3 '
 dN + i+?U6AS 1t+2TiBQM 72V &
 3y 72XT`BMiai +Fh` +2UVc
 3R '

9 ?iiT,ffD /2XiBH #X+QKf/Q+f TBfD /2f/QK BMf.6a2`pB+2X?iKH U9HiBKQ

3k ff *HQbi22:IA
 3j Kv:mBX/BbTQb2UVc
 39 ff S`B MiQm/BbK BbK 2bb ;2
 38 avbi2KXQmiXT]B2MiHMUMijY;2i A.UVX;2iL]K2UKVYM iXVlc
 3e '

+H bP22`_2[m2bibBakTpi2`K2Mi mK /Qb +QKTQ`i 'K2MiQb / +H
 QFa2HHX` Q2Mti2M/2` D+H2Kb2`2X#2? pBQm`B-XQv+HB+@? pBQm
 iBQM2UV2i2 @b2 " K2/B2imfBMYQ[m2@QX i` pûb /2bi2 +QKTQ`i K2M
 p2M/2/Q` TQ/2 i2M/2` Qb T2/B/Qb /2 Q72`i `2+2#B/Qb /2 ;2Mi2

IK BMbi•M+B /D+/2Xhb2M;X +HXJ2bTQ2bBKBHBi2 [m2 b K2Mb
 ;2Mb `2+2#B/ b T2HQ ;2Mi2 p2M/2/Q` b2D K }Hi` / bX 1bi +H bb2
 b2`2K mb /Qb Q +? K`2Q2Bxi2mQ/M/Q mK KQ/2HQ û 2bT2+B}+ /Q- G
 `2+2Bp2iQVM T`BK2B` +Q`2bTQM/ M+B / K2Mb ;2K- b2 ?Qmp
 K2Mb ;2Mb M½Q +Q`2bTQM/2Mi2bX

* #2 `2bb Hi` [m2 iQ/ K2Mb ;2K +Q`2bTQM/2 BMbi•M+B b
 b ;2X 1bi +H bb2 BKTH2K2Mi Q T /`½Q 6AS @ *G 2- bbBK- /BbT
 /2 i`B#miQb [m2 2bi½Q /2 +Q`/Q +QK b 2bT2+B}+ İä2b 6AS X

L2bi2 + bQ- 2bT2` @b2 `2+2#2` *TH7QQK SBQ QmSHQ
 ;2Mi2b +QKT` /Q`2b bQHB+Bi K T`QTQbi b Qb ;2Mi2b p2M/2/Q`
 HBp`Q [m2 /2b2D K +QKT` `X a2 Q HBp`Q bQHB+Bi /Q 2biBp2` /B
 ;2Mi2 p2M/2/Q` `2bTQM/2 +QK mPSPKa2MT2;2BK}+ M/Q Q T`2İQX * b
 +QMi`€`BQ- mK K2Mb 1û2KmpB / X

Ry3 T`Bp i2H bB772`_2[m2bib2i2M/bv+HB+"2? pBQm` &
 RyN Tm#HBBQ B/+iBQMUV &
 RRY J2bb ;2h2KTH i2 Ki 4 J2bb ;2h2KTH i2XJ i+?S2`7Q`K iBp2U *GJ
 RRR *GJ2bb ;2 Kb; 4 Kv ;2MiX`2+2Bp2UKiVc
 RRk B7UKb; 5MmVH&
 RRj ff *6SJ2bb ;22+2Bx2S`Q+2Bb
 RR9 ai`BM; iBiH2 4 Kb;X;2i*QMi2MiUVc
 RR8 *GJ2bb ;2 `2THv 4 Kb;X+`2 i2_2THvUVc
 RRe
 RRd AMi2;2` T`B+2 4 UAMi2;2`V + i HQ;m2X;2iUiBiH2Vc
 RR3 B7UT`B+2 5MmVH&
 RRN ff h?2`2[m2bi#QQFb p BH #HQ`b HX2_2THrBi?i?2T`B+2
 Rky `2THvXb2iS2`7Q`K iBp2U *GJ2bb ;2XS_PSPa1Vc

⁸ ?iiT,ffD /2XiBH #X+QKf/Q+f TBfD /2f+Q`2f#2? pBQm`bf*v+HB+"2? pBQm`X
 kyRdV
^e ?iiT,ffD /2XiBH #X+QKf/Q+f TBfD /2fH M;f +HfJ2bb ;2h2KTH i2X?iKH U9Hi
^d ?iiT,ffD /2X+b2HiXBif/Q+f TBfD /2fH M;f +Hf *GJ2bb ;2X?iKH U9HiBKQ +2

RkR `2THvXb2i*QMi2MiUai`BM;Xp Hm2P7UT`B+2XBMio Hm2U
Rkk '
Rkj 2Hb&
Rk9 ff h?2'2[m2bi#QQFbLPhp BH #7Q`b HX
Rk8 `2THvXb2iS2`7Q`K iBp2U *GJ2bb ;2X_16la1Vc
Rke `2THvXb2i*Q M2Mi UBH #Me
Rkd '
Rk3 Kv ;2MiXb2M/U`2THvVc
RkN '
Rjy 2Hb&
RjR #HQ+FUVC
Rjk '
Rjj '
Rj9 ' ff 1M/Q7BMM#H bB772`_2[m2biba2`p2`

.2 KQ/Q b2K2H? MiSm`+H b2P`/2`ib k2`up22bT2+B}+ mK +Q
TQ`i K2MiQ /Q+BTBQ"2?2pB Qm/ Q`2+2#BK2MiQ /2 mK T2`7Q
T2+Q}#*1ShnS_PSPaXGbi u`2+2#B/ [m M/Q Q ;2Mi2 +QKT`
T`QTQbi 2 p2M/ /Q HBp`Q TQ/2- TQ`i MiQ- b2` T`Q+2bb / X
HBp`Q +QKT` /Q /2 b2m + iEHQ;Q 2`2bT QM/P_+JQK rMQiB2Mb ;
Q +QKT` /Q` /2 [m2 +QKT` 7QB +QM+HmQ/ X

R99 T`Bp i2H bSm`+? b2P`/2`b a2i2M/bv+HB+"2? pBQm` &
R98 Tm#HQB/+iBQMUV &
R9e J2bb ;2h2KTH i2 Ki 4
J2bb ;2h2KTH i2XJ i+?S2`7Q`K iBp2U *GJ2bb ;2X **1ShnS
R9d *GJ2bb ;2 Kb; 4 Kv ;2MiX`2+2Bp2UKiVc
R93 B7UKb; 54mVH&
R9N ff **1ShnS_PSPaXG;22+2BxS`Q+2Bb
R8y ai`BM; iBiH2 4 Kb;X;2i*QMi2MiUVc
R8R *GJ2bb ;2`2THv 4 Kb;X+`2 i2_2THvUVc
R8k '
R8j AMi2;2` T`B+2 4 UAMi2;2`V + i HQ;m2X`2KQp2UiBiH2Vc
R89 B7UT`B+2 54mVH&
R88 `2THvXb2iS2`7Q`K iBp2U *GJ2bb ;2XAL6P_JVc
R8e avbi2KXQmiXT`B MiHQB H;2Mi
]YKb;X;2ia2M/2`UVX;2iL K2UVVc
R8d '
R83 2Hb&
R8N ff h?2'2[m2bi#QQF b#22 MQHi/Q MQi?#mv2BM?2
K2 Mr?BXH2
Rey `2THvXb2iS2`7Q`K iBp2U *GJ2bb ;2X6 AGI_1Vc

ReR `2THvXb2i*QjM20iUBH #Mc
 Rek '
 Rej Kv ;2MiXb2M/U`2THvVc
 Re9 '
 Re8 2Hb&
 Ree #HQ+FUVC
 Red '
 Re3 '
 ReN ' ff 1M/Q7BMMzH bB772`_2[m2biba2`p2`
 Rdy '

"XRX9 *HQbF2"mv2` ;2Mi

+H b"QQF"mv2`B;2MH2K2Mi Qb +QKTQ`i K2MiQb`2H +BQM
 /Q HBp`Q /2 Bmi2`2bb2 /Q ;2Mi2 +QKiT/UfXBLQMK @iQ/ QK +QKTQ
 i K2MiQ /QhBTFQ2`"2?3x BQim`+H b2 TQbbB#BHBi [m2 2t2+mi2@b
 +!/B;Q TQ` mK T2`QQ/Q /2 i2KTQ T`û@/2}MBQBTXQSUK2BQ/Q KûiC
 + bQ- 7QB /2}MB/ /m` ĩ½Q /2 mK KBMmiQX

IK BmBi•M+B /a2HpBb2.2b+ûB+TiBQMT` /2}MB` mK b2`pBİQ
 iBT#QQF@b2HHBm2- i` pûb /2 mK BmBi•M+2Mi/.2bH`BF2BQMUV
 b2D K #mb+ /Qb ;2Mi2b p2M/2/Q`2b [m2 TQb,2i"Q2KbSDH+ i€HQ
 }K- Qb A.b/Qb ;2Mi2b [m2 T`2bi K Q b2`pBİQ bQHB+Bi /Q b½Q b H
 b2HH2`X;2Mib

je Tm#HBH b"QQF"mv2` 22iMM/b;2Mi &
 jd ff h?2BiH27i?2#QQiQ #mv
 j3 T`Bp i2i`BM; i` ;2i"QQFhBiH2c
 jN ff h?2HBbQ7FMQb2HH2;2Mib
 9y T`Bp i2A.() b2HH2` ;2Mibc
 9R
 9k ff Smi;2MBMBiB HBx i?2Q2Mb
 9j T`Qi2+i2QBb2imTUV &
 99 ff S`BmiQm2H+QK2bb ;2
 98 avbi2KXQmiXT]BmHMu @;2MjY;2i A.UVX;2iL]K2uY Vc
 9e
 9d ff :2ii?2iBiH27i?2#QQiQ #m vb bi`i@nT`;mK2Mi
 93 P#D2+i() ` ;b 4 ;2i` ;mK2MibUVc

³ ?iiT,ffD /2XiBH #X+QKf/Q+f TBfD /2f+Q`2f#2? pBQm`bfhB+F2`"2? pBQm`X
 kyRdV
 N ?iiT,ffD /2XiBH #X+QKf/Q+f TBfD /2f/QK BMf6AS ;2MiJ M ;2K2Mifa2`pB+2
 U9HiBKQ +2bbQ DmM?Q /2 kyRdV

9N B7U `;b 5MmHH `;bXH2M;i? = yV &
8y i `;2i"QQFhBiH2 4 Uai`BM;V `;b(y)c
8R avbi2KXQmiXTjBm;2HMUQFb]Yi `;2i"QQFhBiH2Vc
8k
8j ff // hB+F2`"2? piBQib+?2/mH2B[m2bQb2HH2;2Mib
2p2`KBMmi2
89 //"2? pBQM2UB+F2`"2? piBQ+èVyyyV &
88 T`Qi2+iBQBMhB+FUV &
8e avbi2KXQmiXTjBmBHMU#mY]Yi `;2i"QQFhBiH2Vc
8d ff IT/ i2i?2HBbQ7b2HH2;2Mib
83 .6 ;2Mi.2b+`BTiBQM i2MTH6i22Mi.2b+`BTiBQMUVc
8N a2`pB+2.2b+`BTiBQM a2/pB+2.2b+`BTiBQMUVc
ey b/Xb2ihv]#2U@F2HH]BMc;
eR i2KTH i2X //a2`pB+2bUb/Vc
ek i`v &
ej .6 ;2Mi.2b+`BTiBQM() `2bmHi 4 .6a2`pB+2Xb2 `+?UKv
i2KTH i2Vc
e9 avbi2KXQmiXTjBmHMU7QH HQ rB2H;H2;2Mi]Vc
e8 b2HH2` ;2MMb 4A.(`2bmHiXH2M;i?)c
ee 7Q`UBMB 4 yc B l `2bmHiXH2M;i?c YYBV &
ed b2HH2` ;2Mib(B) 4 `2bmHi(B)X;2iL K2UVc
e3 avbi2KXQmiXT`BmiHMUb2HH2` ;2Mib(B)X;2iL K2UVV
eN '
dy '
dR + i+?U6AS 1t+2TiBQM 72V &
dk 72XT`BMiai +Fh` +2UVc
dj '

1K b2;mB/ - Q +QKT_Q[im2MSQ` 7Q/ B2BQM /Q Q ;2Mi2 +Q
/Q`X

d8 ff S2`7QîK2`2[m2bi
de Kv ;2MiX //"2? pBQm[m2biS2`7Q`K2`UVVc

* bQ M2M?mK HBp`Q i2M? bB/Q 2bT2+B}+ /Q- Q ;2Mi2 û

3y 2Hb&
3R ff J F2?2 ;2Mi2`KBM i2
3k avbi2KXQmiXTjBmHMU#Q QiBiH2T2+B]Vc/
3j /Q.2H2i2UVc
39 '
38 '

Nk S L.A*1 "X AKTH2K2Mi ĩ½Q /Qb T /`ä2b `[mBi2im` Bb Q`; MBx +

GQ;Q Tib- û /2}MB/_2[mBbb\$2`X\$`B2`B` K2Mi2- û 2MpB / m
K2Mb ;2K *6S T ` iQ/Qb Qb ;2Mi2b p22NH/22QX;2M/bHBbi

N3 T`Bp i2H bb2[m2biS2`7QtK2M/b2? pBQm` &
NN T`Bp i2A. #2bia2HHf2h2;2Mir?QT`QpB/i2?b#2biQ772`
Ryy T`Bp i2M#2biS`Bf2b?#2biQ772`Z/B+2
RyR T`Bp i2Mi2THB2b*Mi f4 ly2+QmMQ7`2THB2bQK2HH2;2Mib
Ryk T`Bp i22bb ;2h2KTH if2 K?2KTH iQ`2+2Bp2THB2b
Ryj T`Bp i2Mbi2T 4 yc
Ry9
Ry8 Tm#HQB/+iBQMUV &
Rye brBi+0bi2TV &
Ryd + b2y,
Ry3 ff a2M/?2+7TtQ HHb2HH2`b
RyN *GJ2bb ;2 +M2r4*GJ2bb ;2U *GJ2bb ;2X*6SVc
RRy 7Q`UBMB 4 yc B l b2HH2` ;2MibXH2M;i?c YYBV &
RRR +7TX //_2+2Bp2`Ub2HH2` ;2Mib(B)Vc
RRk
RRj +7TXb2i*QMi2MiUi `;2i"QQFhBiH2Vc
RR9 +7TXb2i*QMp2`b]#BQM/2UVc
RR8 +7TXb2i_2THv+7BY2Ubi2KX+m`2MihBK2UfBHMbb2Vhc2
RRe Kv ;2MiXb2M/U+7TVc
RRd ff S`2T `i22i2KTH iQ;2iT`QTQb Hb
RR3 Ki 4
J2bb ;2h2KTH i2X M/UJ2bb ;2h2KTH i2XJ]#QOM/2V`b iBQM
RRN J2bb ;2h2KTH i2XJ i+?AM_2THvhQU+7TX;2i_2THvqBi?UVV
Rky bi2T 4 Rc
RkR #`2 2

1K b2;mB/ - iQ/ b b K2Mb ;2Mb `2+2#B/ b b½Q HB/ bX [m2H
+Q`2bTQM/_2PSPa1 K b2m +QMi29/Q HB/Q- Q [m2 +Q`2bTQM/2 Q
GQ;Q Tib- Qb T`2iQb b½Q +QKT ` /Qb iû [m2#222SM/BQ Mi`2 Q K B

Rkk + b2R,
Rkj ff _2+2Bp2HT`QTQb`H2mb H`bQK2HH2;2Mib
Rk9 *GJ2bb ;2 `2THv 4 Kv ;2MiX`2+2Bp2UKiVc
Rk8 B7U`2THv M4VH&
Rke ff _2TH2+2Bp2/
Rkd B7U`2THvX;2iS2`7Q`K iBp2UV 44 *GJ2bb ;2XS_PSPa1V &
Rk3 ff h?BBb MQ772`
RkN BMi`B+2 4 AMi2;2`XT `b2AMiU`2THvX;2i*QMi2MiUVVc
Ryj B7U#2bia2HH2Mm44% T`B+2 l #2biS`B+2V &

RjR ff h?BBbi?2#2biQ772i T`2b2Mi
 Rjk #2biS`B+2 4 T`B+2c
 Rjj #2bia2HH2` 4 `2THvX;2ia2M/2`UVc
 Rj9 '
 Rj8 '
 Rje `2THB2b*MiYYc
 Rjd B7U`2THB2b*Mi =4 b2HH2` ;2MibXH2M;i?V &
 Rj3 ff q2`2+2Bp2HH2THB2b
 RjN bi2T 4 kc
 R9y '
 R9R '
 R9k 2Hb&
 R9j #HQ+FUVC
 R99 '
 R98 #`2 f

1K b2;mB/ - û 2MpB /Q Q T2/B/Q Q p2M/2/Q` [m#27bQ@M2+
 a2HW2i` pûb / T2`7Q*KI \$BpS_PSPaXG

R9e + b2k,
 R9d ff a2Mi?2Tm`+? Q2/2iQi?2b2HH2? iT`QpB/i2/2#2bi
 Q772`
 R93 *GJ2bb ;2 Q`/M2r4*GJ2bb ;2U *GJ2bb ;2X **1ShnS_PSPa G
 R9N Q`/2`X //_2+2Bp2`U#2bia2HH2`Vc
 R8y Q`/2`Xb2i*QMi2MiUi `;2i"QQFhBiH2Vc
 R8R Q`/2`Xb2i*QMp2`b]#BOM/2/c
 R8k Q`/2`Xb2i_2THvqB2?Uavbi2KX+m``2MihBK2JBHHBbUVVc
 R8j Kv ;2MiXb2M/UQ`/2`Vc
 R89 ff S`2T `i22i2KTH iQ;2ii?2Tm`+? Q2/2`2THv
 R88 Ki 4
 J2bb ;2h2KTH i2X M/UJ2bb ;2h2KTH i2XJ]#QOM/2/-b iE
 R8e J2bb ;2h2KTH i2XJ i+?AM_2THvhQUQ`/2`X;2i_2THvqBi
 R8d bi2T 4 jc
 R83 #`2 f

T2`7Q`K ABpP_ bB;MB}+ - M2bi2 + bQ- [m2 +QKT` 7QB
 tBiQX * bQ`2+2# [m H[m2` Qmi` K2Mb ;2K- bB;MB}+ [m2 i

R8N + b2j,
 Rey ff _2+2Bp?2Tm`+? Q2/2`2THv
 ReR `2THv 4 Kv ;2MiX`2+2Bp2UKiVc
 Rek B7U`2THv M4VH&

Rej ff Sm`+? Q2/2`2TH\2+2Bp2/
 Re9 B7U`2THvX;2iS2`7Q`K iBp2UV 44 *GJ2bb ;2XAL6P_JV &
 Re8 ff Sm`+? b2++2bXq2+HM2`KBM i2
 Ree avbi2KXQmiXT`BMiHMUi `;2b"Q-Q-F2hb7T2M+V b2/
 7`QK;2MijY`2THvX;2ia2M/2`UVX;2iL K2UVVc
 Red avbi2KXQmiXT]S`B+H]U#2biS`B+2Vc
 Re3 Kv ;2MiX/Q.2H2i2UVc
 ReN '
 Rdy 2Hb&
 RdR avbi2KXQmiXT]BIMKHMUBH,2/2[m2bi2QQH`2 /v
 bQX/Vc
 Rdk '
 Rdj
 Rd9 bi2T 4 9c
 Rd8 '
 Rde 2Hb&
 Rdd #HQ+FUVC
 Rd3 '
 RdN #`2 6
 R3y '
 R3R '

"XRX8 _2bmHi /Qb / 2t2+mİ½Q

6B;mRNT`2b2Mi BMB+B HBx İ½Q /Q +QMi BM2` 2 /Qb b2`
 C .1X 6B;ky T`2b2Mi TH i 7Q`K C .1 2 2bi`mim` /Q +QMi BM

6B;m` RN a Q/ b /Q +QMbQH2, BMB+B HBx İ½Q / T

6B;m` ky SH i 7Q`K C .1

6B;m`kR T`2b2Mi Q +QKTQ`i K2MiQ +Q+HB+Q /Q ;2Mi2 +
p€`B b i2Mi iBp b /2 +QKT` /Q HBp`Q + / KBMmiQX

