;DGB ,+(F I67A: D; 8DCI:CIH

	GRXV
GRce 0* =Z_R_TZR] 0_W`c^ReZ`_	
$@eV^ -* = Z_R_TZR] JeReV^V_ed$	
: `_d`]ZUReVU JeReV^V_ed`W FaVcReZ`_d W`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(.,., R_U .,-5 %f_RfUZeVU&	
: `_d`]ZUReVU JeReV^V_ed`W : `^acVYV_dZgV@_T`^V %C`dd& W`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(.,., R_U .,-5 %f_RfUZeVU&	/
: `_d`]ZUReVU 9R]R_TV JYVVed Rd `W JVaeV^SVc /,(.,., %f_RfUZeVU& R_U Af_V /,(.,., %RfUZeVU&	0
: `_d`]ZUReVU JeReV^V_ed `W : RdY =]` h d W`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc / ,(. , . , R_U . , -5 %f_RfUZeVU&	1
E`eVd e` eYV L_RfUZeVU : `_d`]ZUReVU =Z_R_TZR] JeReV^V_ed	2
XV	

E6GI >

>I:B,);>C6C8>6AHI6I:B:CIH

C: LH 8DGEDG6 I>DC

8DCHDA>961:9 H161:B:CIHD; DE:G61>DCH

 $L_RfUZeVU7 ^2]]Z^d(ViTVae~aVc~dYRcV~R^^ f_ed\&$

		;_b dXU dXbUU HU`dU]	
	C_dUc	-+-+	-+,4
IVgV_fVd6			
: ZcTf]ReZ`_ R_U dfSdTcZaeZ`_		! -(,,.	! 551
8 UgVceZdZ_X		//.	2,4
: `_df ^ Vc		00-	/43
I VR] VdeReV		./1	4
FeYVc		-,3	-/.
$K^eR] IVgV_fVd$.(3	.(/0,
FaVcReZ_X ViaV_dVd		%-(-20&	%-(//4&
JV]]Z_X(XV_VcR] R_U RU^Z_ZdecReZgV		%241&	%34-&
; VacVTZReZ`_ R_U R^`ceZkReZ`_		% - 20 &	%-2.&
@ ^ aRZc ^ V_e R_U cVdecfTefcZ_X TYRcXVd	/	%O,&	%.53å
 bfZej]`ddVd`W RWWZ]ZReVd	0	% – &	%.&
@_eVcVde %ViaV_dV& Z_T`^V(_Ve		%4&	0
FeYVc(_Ve		-3	0
@_T` ^ V %]` dd& SVW`cV Z_T` ^ V eRi %ViaV_dV& SV_VWZe		3.	%./.&
@_T`^V eRi %ViaV_dV& SV_VWZe	-,	%.1&	
EVe Z_T` ^ V %]`dd&		03	%&
CVdd6 EVe Z_T` ^V ReecZS feRS]V e` _`_T`_ec`]]Z_X Z_eVcVded		% - /&	% - 2&
$EVe\ Z_T`^V\ \%]`dd\&\ ReecZS\ feRS]V\ e`\ EV\ h\ d\ : `ca`cReZ`_\ de`T\ Y`]UVcd$! /0	! %3&
$EVe\ Z_T`^V\ \%]`dd\&\ ReecZS\ feRS]V\ e`\ EV\ h\ d\ : `ca`cReZ`_\ de`T\ Y`]UVcd\ aVc\ dYRcV6$	4		
9RdZT R_U UZ]feVU		! ,*,2	! %,*/5&

 $KYV\ RTT` ^aR_jZ_X _`eVd\ RcV\ R_Z_eVXcR]\ aRce\ `W\ eYVdV\ f_RfUZeVU\ T`_d`] \\ ZUReVU\ WZ_R_TZR]\ deReV ^V_ed*$

	;_b dXU dXbUU]_^dXc U^TU HU`dU] RUb .+'			
	-+	-+		+,4
EVe Z_T` ^ V %]`dd&	!	03	!	%&
FeYVc T` ^ acVYV_dZgV Z_T` ^ V %]`dd&6				
= \cVZX_TfccV_Tj ecR_d]ReZ \cV_ed		-,3		%-41&
EVe TYR_XV Z_ eYV WRZc gR]fV `W TRdY W]` h YVUXVd\R\		%.&		% - O &
9V_VWZe a]R_ RU[fde^V_ed(_Ve ^{USA}		4		
FeYVc T`^acVYV_dZgV Z_T`^V %]`dd&		/		%-44&
: ` ^ acVYV_dZgV Z_T` ^ V %] ` dd&		-2,		%/55&
CVdd6 EVe Z_T` ^ V ReecZS feRS]V e` _`_T`_ec`]]Z_X Z_eVcVded		%-/&		%-2&
CVdd6 FeYVc T` ^ acVYV_dZgV %Z_T` ^ V&]`dd ReecZS feRS]V e` _ `_T`_ec`]]Z_X Z_eVcVded		%-3&		01
: ` ^ acVYV_dZgV Z_T` ^ V %] ` dd& ReecZS feRS]V e` EV h d : ` ca ` cReZ` _ de` T \ Y`]UVcd	!	-/,	!	%/3,&

EVe `W Z_T` ^ V eRi SV_VWZe `W _Z] R_U ! / ^Z]]Z`_ W`c eYV eYcVV ^`_eYd V_UVU JVaeV ^SVc /,(., ., R_U ., -5(cVdaVTeZgV]j*

KYV RTT` ^ aR_jZ_X _ `eVd RcV R_ Z_eVXcR] aRce `W eYVdV f_RfUZeVU T`_d`]ZUReVU WZ_R_TZR] deReV ^ V_ed*

^{*}S& EVe `W Z_T` ^V eRi ViaV_dV `W !/ ^Z]]Z`_ W`c S`eY eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(., ., R_U ., -5*

8DCHDA>96I:9HI6I:B:CIHD;86H=;ADLH

C: LH 8DGEDG6I>DC CDI:HIDI=: JC6J9>I:9 8DCHDA>96I:9;>C6C8>6A HI6I:B:CIH

CDI: ,) 9:H8G>EI>DCD; 7JH>C:HH 6C9 76H>HD; EG:H:CI6I>DC

 $EV hd: `ca`cReZ`_ \%e`XVeYVc hZeY Zed dfSdZUZRcZVd(qEV hd: `ca`cReZ`_ (r qEV hd: `ca(r eYV q: `^aR_j (r qhVr`c qfdr& Zd R X]`SR] UZgVcdZ\\ZVU ^VUZR R_U Z_\\cap c^ReZ`_ dVcgZTVd T`^aR_j T`^acZdVU `\wSfdZ_VddVd RTc`dd R cR_XV `\w^VUZR (Z_T]fUZ_X6 UZXZeR] cVR] VdeReV dVcgZTVd (dfSdTcZaeZ`_ gZUV` dVcgZTVd Z_ 8 fdecR]ZR(_V hd R_U Z_\\cap c^ReZ`_ dVcgZTVd R_U S``\ afS]ZdYZ_X*$

; fcZ_X eYV W` fceY bfRceVc `W WZdTR] . , . , (Z_T`__VTeZ`_ hZeY eYV : `^aR_j \ddR]V `W Zed EV hd 8 ^VcZTR DRc\VeZ_X cVa`ceZ_X f_Ze R_U Zed R__fR] cVgZV h `W Zed cVa`ceRS]V dVX ^V_ed(eYV : `^aR_j UVeVc^Z_VU e` UZdRXXcVXReV Zed ; `h A`_Vd`aVcReZ_X dVX ^V_e Rd R dVaRcReV cVa`ceRS]V dVX ^V_e Z_RTT`cUR_TV hZeY 8 TT` f_eZ_X JeR_URcU : `UZWZTReZ`_ \mathbb{q} 8 J : r\mathbb{k} . 4 , (qJVX ^V_e I Va`ceZ_X\mathbb{r} CeZ_X\mathbb{r} CeZ_X\mathbb{r} CeZ_X\mathbb{r} CeYUZ^* fd]j(eYV WZ_R_TZR] Z_W`c^ReZ`_ \mathbb{w}`c eYZd`aVcReZ_X dVX ^V_e hRd RXXcVXReVU hZeY eYV SfdZ_VddVd hZeYZ_eYV EV hd DVUZR `aVcReZ_X dVX ^V_e R_U(e`XVeYVc(\mathbb{w}`c^VU eYV EV hd R_U \mathbb{e}_W`c^ReZ`_ JVcgZTVd cVa`ceRS]V dVX ^V_e\mathbb{r} = `]]`hZ_X eYV dR]V`\mathbb{w} Zed EV hd 8 ^VcZTR DRc\VeZ_X SfdZ_Vdd Z_eYV \mathbb{w}`fceY bfRceVc`\mathbb{w} \mathbb{w} \mathbb{r} CeYU \mathbb{r} CAZ_VU eYRe RXXcVXReZ`_ hRd_`]`_XVc Raac`acZReV Rd TVceRZ_`\mathbb{w} eYV : `^aR_j sd R__fR] SfUXVeZ_X ac`TVdd(eYV : `^aR_j UVeVc^Z_VU eYRe RXXcVXReZ`_ hRd_`]`_XVc Raac`acZReV Rd TVceRZ_`\mathbb{w} eYV cV^RZ_Z_X SfdZ_VddVd_`]`_XVc dYRcVU dZ^Z]Rc VT`_`^AZT TYRcRTeVcZdeZTd\mathbb{w} 8 R cVdf]e(eYV : `^aR_j YRd cVgZdVU Zed YZde`cZTR] UZdT]`dfcVd \mathbb{w}`c eYV acZ`c aVcZ`U e`cV\mathbb{w} Vd R U EVhd DVUZR cVa`ceRS]V dVX^V ed\mathbb{w}

+; LCL H@ 6K?L?GN; MCHG

 $KYV\ RTT^{a}_{aR_{j}Z_{X}}f_{RfUZeVU\ T^{d}_{z}ZUReVU\ WZ_{R_{z}Z_{R}}deReV^{ed}^{w}eYV: ^{a}_{aR_{j}(hYZTY\ RcV\ cVWVccVU\ e^{YVcVZ_{Rd\ eYV}}q: ^{a}_{z}X\ f_{RfUZeVU\ T^{d}_{z}Z_{R}}JeReV^{ed}^{w}Z_{R_{z}Z_{R}}deReV^{ed}^{w}eYV: ^{a}_{z}Z_{R_{z}Z_{R}}JeReV^{e}_{z}Z_{R_{z}Z_{R}}JeReV^{e}_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}^{w}Z_{z}Z_{z}^{w}Z_{z}^$

@_eVcT`^aR_j ecR_dRTeZ`_d R_U SR]R_TVd YRgV SVV_ V]Z^Z_ReVU* <bfZej Z_gVde^V_ed Z_ h YZTY eYV : `^aR_j ViVcTZdVd dZX_ZWZTR_e Z_W]fV_TV Sfe U`Vd_`e ViVcTZdV T`_ec`] R_U Zd_`e eYV acZ^Rcj SV_VWZTZRcj RcV RTT`f_eVU W`c fdZ_X eYV VbfZej ^veY`U*

@_gVde^V_ed Z_ h YZTY eYV : `^aR_j Zd_`e RS]V e` ViVcTZdV dZX_ZWZTR_e Z_W]fV_TV `gVc eYV Z_gVdeVV RcV ^VRdfcVU Re WRZc gR]fV Zd
eYV WRZc gR]fV Zd cVRUZ]j UVeVc^Z_RS]V*@W R_ Z_gVde^V_esd WRZc gR]fV Zd_`e cVRUZ]j UVeVc^Z_RS]V(eYV : `^aR_j hZ]] ^VRdfcV eYV

Z_gVde^V_e Re T`de(]Vdd R_j Z^aRZc^V_e(a]fd`c^Z_fd TYR_XVd cVdf]eZ_X Wc`^ `SdVcgRS]V acZTV TYR_XVd Z_`cUVc]j ecR_dRTeZ`_d
W`c R_ZUV eZTR]`c dZ^Z]Rc Z_gVde^V e`W eYV dR^V ZddfVc*

 $KYV\ T^{d}\ [ZUReVU\ deReV^V_ed^W^aVcReZ^d\ RcV\ cVWVccVU\ e^YVcVZ_Rd\ eYV\ qJeReV^V_ed^W\ FaVcReZ^d^*r\ KYV\ T^d^]ZUReVU\ SR]R_TV\ dYVVed\ RcV\ cVWVccVU\ e^YVcVZ_Rd\ eYV\ q9R]R_TV\ JYVVed^*r\ KYV\ T^d^]ZUReVU\ deReV^V_ed^W\ TRdY\ W]^hd\ RcV\ cVWVccVU\ e^YVcVZ_Rd\ eYV\ qJeReV^V\ ed^W\ : RdY=]^hd^*r$

 $KYV RTT^{aR_jZ_X : _d^{2}UReVU = Z_R_TZR] \ JeReV^{ed} \ R_U_{eVd} \ eYVcVe^{dY^{f}U} \ SV \ cVRU \ Z_T^{f}_{f_TeZ^{h}} \ hZeY \ eYV \ R \ fUZeVU \\ T^{d}_{JUReVU} \ WZ_R_TZR] \ deReV^{V}_{ed} \ R_U_{eVd} \ eYVcVe^{Z}_{T} \ fUVU \ Z_{eYV} : ^{aR_jsd} \ 8_fR] \ I \ Va^{ce}_{=c^{-},B} \ W^{c}_{c} \ eYV \ WZdTR] \ j \ VRC \\ V_UVU \ Af_V /, (.,, Rd \ WZ]VU \ hZeY \ eYV \ J \ VT \ fcZeZVd \ R_U < i \ TYR_XV : ^^ZddZ^{weYV} \ qJ < : r\&^{2} \ 8 \ fXfde^{--(.,, \&eYV} \ q.,., e^{-c^{-},B} \ R^{e}_{V}) \ R_U \ eYV \ q.,., e^{-c^{-},B} \ R^{e}_{V} \ eYV \ q.,., e^{-c^{-},B} \ eYV \ q.,., e^{-c^{-},B} \ R^{e}_{V} \ eYV \ q.,., e^{-c^{-},B} \ e$

: VceRZ_ cVT]RddZWZTReZ`_d YRgV SVV_ ^RUV e` eYV acZ`c aVcZ`U T`_d`]ZUReVU WZ_R_TZR] deReV^V_ed e` T`_W`c^e` eYV TfccV_e jVRc acVdV_eReZ`_* JaVTZWZTR]]j(eYV : `^aR_j cVT]RddZWZVU TVceRZ_ T`ded Re eYV FeYVc dVX^V_e eYRe hVcV acVgZ`fd]j Z_T]fUVU hZeYZ_JV]]Z_X(XV_VcR] R_U RU^Z_ZdecReZgV e` FaVcReZ_X ViaV_dVd* = `c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc / ,(. , -5(eYVdV cVT]RddZWZTReZ` d Z TcVRdVU FaVcReZ X ViaV dVd Sj! - ^Z]Z` *

 $KYV : `^aR_j sd \ \mathbb{Z} dTR] \ j \ VRc \ V_Ud \ `_eYV \ J \ f_URj \ T] \ dVde \ e ` Af_V \ / \ * = \mathbb{Z} dTR] \ . , . - R_U \ \mathbb{Z} dTR] \ . , . , \ Z_T] \ fUV \ 1 . \ h \ VV \ d^* \ 8 \]] \ cV \ VVV \ TVde \ e ` eYV \ eYCVV \ ^ `_eYd \ V_UVU \ JVaeV \ SVc \ .3(. , . , R_U \ JVaeV \ SVc \ .5(. , -5(cVdaVTeZgV]j^* = `c T `_gV_ZV_TV \ a \ fca ` dVd(eYV : `^aR_j \ T `_eZ_fVd \ e ` UReV \ Zed : `_d `]ZUReVU = \mathbb{Z}_R_TZR] \ JeReV \ ^V_ed \ Rd \ `W \ JVaeV \ SVc \ / \ ^*$

7?=?GWER OLLN?> *==HNGWCGA 6KHGHNG=?F?GWL

- HSTXIH

DdXUb bUfU^eU TYcS\ cebUc

 $KYV: `^aR_j \ ej \ aZTR]]j \ Vi \ aV_dVd \ dR]Vd \ T`^^ZddZ`_d \ Z_TfccVU \ e``SeRZ_R \ Tfde`^Vc \ T`_ecRTe \ Rd \ eY`dV \ R^^f_ed \ RcV \ Z_TfccVU \ Rd \ eYV \ R^^ceZkReZ`_aVcZ`U \ Zd - . ^^_eYd `c]Vdd^* \ KYVdV \ T`ded \ RcV \ cVT`cUVU \ hZeYZ_JV]]Z_X(XV_VcR] \ R_U \ RU^Z_ZdecReZgV \ Z_eYV \ JeReV^V_ed `W FaVcReZ`_d^* \ KYV : ^aR_j \ R]d` U`Vd_`e \ TRaZeR]ZkV \ dZX_ZWZTR_e \ WZ_R_TZ_X \ T`^a`_V_ed \ hYV_eYV \ ecR_dWVc `W \ eYV \ X``U`c \ dVcgZTV \ Zd \ aRZU \ hZeYZ_- . ^`_eYd`c]Vdd(`c \ eYV \ cVTVZae`W \ T`_dZUVcReZ`_Zd \ cVTVZgVU \ hZeYZ_- . ^`_eYd`c]Vdd`W \ eYV \ ecR_dWVc `W \ eYV \ X``U`c \ dVcgZTV^*$

=`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(.,.,(eYV : `^aR_j cVT`X_ZkVU Raac`iZ^ReV]j !53 ^Z]]Z`_ Z_ cVgV_fVd cV]ReVU e` aVcW`c^R_TV `S]ZXReZ`_d eYRe h VcV dReZdWZVU `c aRceZR]]j dReZdWZVU Z_ R acZ`c cVa`ceZ_X aVcZ`U* KYV cV^RZ_Z_X ecR_dRTeZ`_ acZTV cV]ReVU e` f_dReZdWZVU aVcW`c^R_TV `S]ZXReZ`_d Rd `W JVaeV^SVc /,(.,., hRd Raac`iZ^ReV]j !014 ^Z]]Z`_(`W hYZTY Raac`iZ^ReV]j !-31 ^Z]]Z`_ Zd ViaVTeVU e` SV cVT`X_ZkVU `gVc eYV cV^RZ_UVc `W WZdTR] .,.-(Raac`iZ^ReV]j !--5 ^Z]]Z`_ Zd ViaVTeVU e` SV cVT`X_ZkVU Z_ WZdTR] .,... R_U Raac`iZ^ReV]j !01 ^Z]]Z`_ Zd ViaVTeVU e` SV cVT`X_ZkVU Z_ WZdTR] .,... (hZeY eYV cV^RZ_UVc e` SV cVT`X_ZkVU Z_ WZdTR] .,... (hZeY eYV cV^RZ_UVc e` SV cVT`X_ZkVU eYVcVRWeVc* KYVdV R^`f_ed U`_`e Z_T]fUV %Zk T`_ecRTed hZeY R_ ViaVTeVU UfcReZ`_`W`_V jVRc `c]Vdd(%ZZk T`_ecRTed W`c hYZTY gRcZRS]V T`_dZUVcReZ`_ Zd UVeVc^Z_VU SRdVU `_eYV Tfde`^Vcsd dfSdVbfV_e dR]V `c fdRXV R_U %ZZk RS]V T`_dZUVcReZ`_ Zd UVeVc^Z_VU SRdVU `_eYV dVcZVd XfZUR_TV eYRe ^VVed eYV R]]`TReZ`_`S[VTeZgV f UVc 8 J : 2,2(qIVgV fV=c`^: eRTed NZeY : fde`^Vcdr*

CDI: .)G:HIGJ8IJG>C< EGD<G6BH

7?LNKN=NNKCGA

KYV: `^aR_j YRd VbfZej dVTfcZeZVd hZeY bf`eVU acZTVd Z_RTeZgV ^Rc\Ved Rd hV]] Rd VbfZej dVTfcZeZVd hZeY`fe cVRUZ]j

8 d `W JVaeV ^ SVc / ,(. , . ,(eYV = `ieV] ; VSe > c `fa YRU f_UcRh_ T ` ^ ^Ze ^ V_ed `W 8 ! 51 ^Z]]Z `_ f_UVc eYVdV WRTZ]ZeZVd W `ch YZTY ZeaRjd R T ` ^ ^Ze ^ V_e WVV ` W O1 "

CDI: 1):FJ>IN
KYV W`]]`hZ_X eRS]Vd df ^ ^RcZkV TYR_XVd Z_ VbfZej W`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(.,., R_U .,-56

					;_b dXU dXbUU] _^dXc U^TUT HU	`dU] RUb .+' -+-+			
		8_]]_^ L_S[6]_e^d		8_]]_^ L_S[6]_e^d	6TT\\d\'_^Q\ EQ\\T(\'^ 8Q`\\d\\	6SSe]e\QdUT 9U\YS\d \$Y^]Y\\I_^c\	6SSe] e\QdUT	I_dQ\ CUgc 8_b` : ae\di	C_^(S_^db_\\\^W >^dUbUcdc	I_dQ\ : ae\di
9R]R_TV(Af_V /,(.,.,	/45	! 0	.,,	! .	!(-04	! %/(.0-&	! %-(//-&	! 3(14.	! 4,3	! 4(/45
EVe Z_T`^V	p	p	p	p	p	/0	p	/0	-/	03
FeYVc T` ^ acVYV_dZgV Z_T` ^ V	p	p	p	p	p	p	52	52	-3	/
; ZgZUV_Ud	p	p	p	p	%15&	p	p	%15&	%.,&	%35&
FeYVc		p	p	p	% - O &	p	p	% - O &	% . &	%-2&
9R]R_TV(JVaeV^SVc /,(/5-	! 0		! .	!(.31	! %/(3&	! %-(./1&	! 3(2/5	! 4-1	

9UbYfQdYfU >^cdbe]U^dc

KYV: `^aR_j Zd UZcVTe]j R_U Z_UZcVTe]j RWWVTeVU Sj cZd\d Rdd`TZReVU h ZeY TYR_XVd Z_ TVceRZ_ ^Rc\Ve T`_UZeZ`_d* N YV_ UVV^VU Raac`acZReV(eYV: `^aR_j fdVd UVcZgReZgV Z_decf^V_ed e` ^ZeZXReV eYV a`eV_eZR] Z^aRTe`W eYVdV ^Rc\Ve cZd\d* KYV acZ^Rcj ^Rc\Ve cZd\d ^R RXVU Sj eYV: `^aR j eYc`fXY eYV fdV`W UVcZgReZgV Z_decf^V ed Z_T]fUV6

- m $Z_eVcVde cReV cZd 6 RcZdZ_X Wc^^ WZiVU R_U W]^ReZ_X cReV = ieV] ; VSe > c^fa S^cc^hZ_Xd^*$

KYV: `^aR_j W`c^R]j UVdZX_ReVd bfR]ZWjZ_X UVcZgReZgVd Rd YVUXV cV]ReZ`_dYZad %qYVUXVdr& R_U Raa]ZVd YVUXV RTT`f_eZ_X h YV_
T`_dZUVcVU Raac`acZReV* = `c VT`_`^ZT YVUXVd h YVcV_` YVUXV cV]ReZ`_dYZa YRd SVV_ UVdZX_ReVU(TYR_XVd Z_ WRZc gR]fV RcV
Z_T]fUVU Rd R T`^a`_V_e `W_Ve Z_T`^V Z_ VRTY cVa`ceZ_X aVcZ`U hZeYZ_ FeYVc(_Ve Z_ eYV JeReV^V_ed `W FaVcReZ`_d* KYV
: `^aR_j U`V\$_fV eed^dV UVcZgReZgV WZ_R%AZR] Z_dR%6%6_ed W`c ecRRZRXXX & RdVZYfRReZ&XxdX* a'dVd* bZ^BfXM&XVCd fccZ

? VUXVd RcV T]RddZWZVU Rd TfccV_e `c _`_)TfccV_e Z_ eYV 9R]R_TV JYVVed SRdVU `_ eYVZc ^RefcZej UReVd* I VWVc e` eYV eRS]V SV]`h W`c WfceYVc UVeRZ]d6

:`ca`cReZ`_ %e`XVeYVc(eYV qE 8 D GRceZVdr& R]]VXZ_X gZ`]ReZ`_d `W WVUVcR] R_U deReV R_eZecfde]Rhd R_U T`^^`_]Rh SfdZ_Vdd e`ced* KYV T`^a]RZ_e dVV\d ecVS]V UR^RXVd(Z_[f_TeZgV cV]ZVW R_U Ree`c_Vjds WVVd R_U T`ded* F_ 8 fXfde -O(., -5(eYV E 8 D GRceZVd R_dh VcVU eYV T`^a]RZ_e R_U RddVceVU R T`f_eVcT]RZ^RXRZ_de @_dZX_ZR W`c ScVRTY`W T`_ecRTe(R]]VXZ_X eYRe @_dZX_ZR gZ`]ReVU R acZ`c dVee]V^V_e RXcVV^V_e SVeh VV_E 8 D @_)Je`cV R_U @_dZX_ZR* F_ Af]j -,(., .,(VRTY`W eYV E 8 D GRceZVd R_U @_dZX_ZR WZ]VU R^eZ`_W`c df^^Rcj [fUX^V_e`_eYV T`f_eVcT]RZ^* N YZ]V Ze Zd_`e a`ddZS]V Re eYZd eZ^V e` acVUZTe hZeY R_j UVXcVV`W TVceRZ_ej eYV f]eZ^ReV`feT`^V`W eYZd RTeZ`_(eYV E 8 D GRceZVd SV]ZVgV eYVj YRgV SVV_T`^a]ZR_e hZeY Raa]ZTRS]V]Rhd R_U Z_eV_U e` UVWV_U eYV^dV]gVd gZX`c`fd]j*

BEPEWWMW / SOOYRMGEXMSRW# 5RG%

 $F_E `gV \land SVc \ 4(\ .\,, -/(\ MR]RddZd \ WZ]VU \ R \ T` \land a]RZ_e \ Z_eYV \ L^*J^* \ ; ZdecZTe : `fce \ W`c eYV < RdeVc_ ; ZdecZTe `W DZTYZXR_ %eYV q ; ZdecZTe : `fcer \ RXRZ_de eYV E 8 D GRceZVd R_U EV hd 8 ^VcZTR @_T`ca`cReVU %e`XVeYVc(eYV qE 8 D >c`far \ R]]VXZ_X gZ`]ReZ`_d`W WVUVcR] R_U deReV R_eZec fde]R hd R_U T` ^ ^ `_]R h SfdZ_Vdd e`ced(Z_T]fUZ_X f_WRZc T` ^aVeZeZ`_* KYV T` ^a]RZ_e dVV\d ecVS]V UR ^RXVd(Z_[f_TeZgV cV]ZVW R_U Ree`c_V j ds WVVd R_U T`ded* E 8 D @_) Je`cV R_U E 8 D = J@ RddVceVU R T` f_eVcT]RZ ^ RXRZ_de MR]RddZd W`c f_WRZc T` ^aVeZeZ`_(R]]VXZ_X eYRe MR]RddZd YRd V_XRXVU Z_eYV dR ^V acRTeZTVd eYRe Ze R]]VXVd e` SV f_WRZc* @_E`gV^SVc . , -5(eYV aRceZVd RXcVVU e` UZdT`_eZ_fV eYV f_WRZc T` ^aVeZeZ`_T]RZ ^ R_U T` f_eVcT]RZ ^*$

 $F_; VTV \land SVc -5(.,-/(eYV E 8 D > c) fa wZ]VU R \land eY -e) UZd \land Zdd eYV T \land a]RZ_e R_U \char`DRcTY /, (.,-2(eYV ; ZdecZTe : `fce UZd \land ZddVU MR]RddZdsd Sf_U]Z_X R_U ej Z_X T]RZ \land d^* F_JVaeV \land SVc .1(.,-3(eYV ; ZdecZTe : `fce XcR_eVU MR]RddZdsd \land `eZ`_e `ecR_dWVc eYV TRdV e` eYV L*J*; ZdecZTe : `fce W`c eYV J`feYVc_; ZdecZTe `W EVh P`c\ WeYV qE*P*; ZdecZTe : `fce R^* F_8 acZ] -/(.,-4(eYV E 8 D > c) fa wZ]VU R \land `eZ`_ W`c df \land ^Rcj [fUX \land V_e UZd \land ZddZ_X eYV TRdV h YZTY hRd XcR_eVU Z_aRce R_U UV_ZVU Z_aRce Sj eYV E*P*; ZdecZTe : `fce \`fce \`eX\ fe \`W TVceRZ_ `eYV E*P*; ZdecZTe : `fce R_U UV_ZVU Z_aRce Sj eYV E*P*; ZdecZTe : `fce \`fce \`eX\ fe \`W TVceRZ_ `eYV R]]VXVU T `_ecRTeZ_X acRTeZTVd h VcV [Rh \ f] Sfe UV_ZVU Zed \ `eZ`_ hZeY cVdaVTe e TJRZ \ d RcZdZ_X \ `fe \ W TVceRZ_ `eYV CR]]VXVU T `_ecRTeZ_X acRTeZTVd* \ e_RUUZeZ `_(eYV E*P*; ZdecZTe : `fce R] \ UZd \ ZddVU MR]RddZdsd TJRZ \ d cVJReZ_X e \ WcVV)deR_UZ_X Z_dVce ac `UfTed* F_; VTV \ SVc .,(.,-5(eYV E*P*; ZdecZTe : `fce XcR_eVU eYV E 8 D > c) fasd \ `eZ`_ e \ ViT]fUV eYV eVdeZ \ `_j \ `W MR]RddZdsd d \)]V UR \ RXVd V i aVce (Sfe dfSdVbfV_e]j TJRcZWZVU eYRe MR]RddZd T `f]U dVV\ eYV T `fcesd aVc \ ZddZ = a c) gV UR \ RXVd eYc \ fXY \ `eYVc VgZUV_TV* MR]RddZd WZ]VU R \ `eZ`_ e \ dfaa]V \ V_e R_U R \ V_U Zed Vi aVce R_U acV)ecZR] UR \ RXVd UZdT] \ dfcVd(h YZTY eYV E*P*; ZdecZTe : `fce XcR_eVU \ _8 acZ] .0(.,., *F_DRj 4(.,., (eYV E 8 D > c) fa wZ]VU R \ `eZ`_ e \ c'VT_ dZUVc eYV E*P*; ZdecZTe : `fcesd 8 acZ] .0(.,., UVTZdZ \ (h YZTY eYV T fce UV_ZVU \ _FTe`SVc ./(.,., *8 ecZR] UReV YRd \ `e SVV_ dVe Sj eYV T `fce* N YZ]V Ze Zd \ `e a`ddZS]V Re eYZd eZ \ V e` acVUZTe hZeY R_j UVXcVV \ W TVceRZ_ej eYV f]eZ \ ReV \ `feT \ ^V \ W eYZd RTeZ \ _(eYV E 8 D > c) fa SV]ZVgVd Ze YRd SVV_ T \ ^a]ZR_e hZeY Raa]ZTRS]V]Rhd R_U Z_eV_U de \ UVWV_U ZedV]W gZX \ c`fd]j*$

A%7%:I[WTETIV 9EXXIVW]

 $: ZgZ] \ T]RZ \land d \ YRgV \ SVV_Sc `fXYe \ RXRZ_de \ eYV : ` \land aR_j \ h ZeY \ cVdaVTe \ e`(R \land `_X ` eYVc \ eYZ_Xd(g `ZTV \land RZ] \ Z_eVcTVaeZ _ R_U Z_Raac` acZReV \ aRj ` V_ed \ e` afS]ZT ` ` \w\ZTZR]d \ Re \ eYV : ` \land aR_j \ sd \ w` c ^ Vc \ afS]ZTReZ`_(@LI : I[W SJ XLI \ CSVPH(R_U \ Re @LI ?YR(R_U \ cV]ReVU ^ ReeVcd \ \ eYV \ qL*B* EV \ h \ daRaVc \ D \ ReeVcdr\ \ k* KYV : ` \ \ aR_j \ YRd \ RU ^ ZeeVU]ZRSZ]Zej \ Z_ ^ R_j \ TZgZ] \ TRdVd \ R_U \ YRd \ dVee]VU \ R_f ^ SVc ` \ W \ TRdVd* \ KYV : ` ^ aR_j \ R]d` \ dVee]VU \ R_f ^ SVc ` \ W \ T]RZ ^ d \ eYc` \ fXY \ R \ acZgReV \ T` ^ aV_dReZ`_ \ dTYV ^ V \ h \ YZTY \ h \ Rd \ T]` \ dVU \ e` \ _Vh \ T]RZ ^ d \ R\ weVc \ 8 \ acZ] \ 4(. , -/*$

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cVTVZgRS]V Z_ FeYVc TfccV_e RddVed `_ eYV 9R]R_TV JYVVe Rd `W JVaeV ^SVc /,(.,., * @e Zd _`e a`ddZS]V e` VdeZ ^ReV eYV]ZRSZ]Zej `c T`ccVda`_UZ_X cVTVZgRS]V W`c R_j RUUZeZ`_R] T]RZ ^d eYRe ^Rj SV WZ]VU XZgV_ eYV Z_W`c ^ReZ`_ eYRe Zd TfccV_e]j RgRZ]RS]V e` eYV : `^aR_j*@W ^`cV T]RZ ^d RcV WZ]VU R_U RUUZeZ`_R] Z_W`c ^ReZ`_ SVT` ^Vd RgRZ]RS]V(eYV : `^aR_j hZ]] faUReV eYV]ZRSZ]Zej ac`gZdZ`_ R_U T`ccVda`_UZ_X cVTVZgRS]V W`c dfTY ^ReeVcd*

KYV: `^aR_j Zd_`e RS]V e` acVUZTe eYV f]eZ^ReV `feT`^V `c T`de `W eYV TZgZ] T]RZ^d* @e Zd a`ddZS]V eYRe eYVdV ac`TVVUZ_Xd R_U R_j RUgVcdV cVd`]feZ`_ eYVcV`W T`f]U UR^RXV Zed cVa feReZ`_(Z^aRZc Zed RSZ]Zej e` T`_UfTe Zed SfdZ_Vdd R_U RUgVcdV]j RWWVTe Zed cVdf]ed `W`aVcReZ` d R U WZ R TZR] T` UZeZ` *

; XLIV

KYV: `^aR_jsd eRi cVefc_d RcV dfS[VTe e` `_)X`Z_X cVgZVh R_U ViR^Z_ReZ`_ Sj gRcZ`fd eRi RfeY`cZeZVd* KRi RfeY`cZeZVd ^Rj _`e RXcVV hZeY eYV ecVRe^V_e `W ZeV^d cVa`ceVU Z_eYV: `^aR_jsd eRi cVefc_d(R_U eYVcVW`cV eYV `feT`^V `W eRi cVgZVhd R_U ViR^Z_ReZ`_d TR_SV f_acVUZTeRS]V*

KYV: `^aR_j SV]ZVgVd Ze YRd Raac`acZReV]j RTTcfVU W`c eYV ViaVTeVU `feT`^V`W f_TVceRZ_eRi ^ReeVcd R_U SV]ZVgVd dfTY

|ZRSZ]ZeZVd cVacVdV_e R cVRd`_RS]V ac`gZdZ`_ W`c eRiVd f]eZ^ReV]j ViaVTeVU e` SV aRZU7 Y`hVgVc(eYVdV |ZRSZ]ZeZVd ^Rj _VVU e` SV

RU[fdeVU Rd _V h Z_W`c^ReZ`_ SVT`^Vd _`h_ R_U Rd eRi ViR^Z_ReZ`_d T`_eZ_fV e` ac`XcVdd(`c Rd dVee]V^V_ed `c]ZeZXReZ`_d

`TTfc*

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8e eYV V_U `W VRTY Z_eVcZ^ aVcZ`U(eYV : `^aR_j VdeZ^ReVd eYV R__fR] VWWVTeZgV eRi cReV R_U Raa]ZVd eYRe cReV e` Zed `cUZ_Rcj bfRceVc]j VRc_Z_Xd* KYV eRi ViaV_dV `c SV_VWZe cV]ReVU e` dZX_ZWZTR_e(f_fdfR] `c ViecR`cUZ_Rcj ZeV^d eYRe hZ]] SV dVaRcReV]j cVa`ceVU `c cVa`ceVU _Ve `W eYVZc cV]ReVU eRi VWWVTe RcV Z_UZgZUfR]]j T`^afeVU R_U cVT`X_ZkVU Z_ eYV Z_eVcZ^ aVcZ`U Z_ hYZTY eY`dV ZeV^d `TTfc*@_RUUZeZ`_(eYV VWWVTed `W TYR_XVd Z_ V_RTeVU eRi]Rhd `c cReVd `c eRi deRefd RcV cVT`X_ZkVU Z_ eYV Z_eVcZ^ aVcZ`U Z_ hYZTY eYV TYR_XV `TTfcd* KYV TYR_XZ_X R_U g`]ReZ]V ^RTc`)VT`_^^ZT T`_UZeZ^ d T`__VTeVU hZeY : FM@;)-5 ^Rj TRfdV \| TffReZ^ d Z_ W`cVTRdeVU VRc_Z_Xd SVW`cV Z_T`^V eRiVd* 8d dfTY(eYV : `^aR_jsd VWWVTeZgV eRi cReV T`f]U SV dfS[VTe e` g`]ReZ]Zej Rd W`cVTRdeVU VRc_Z_Xd SVW`cV Z_T`^V eRiVd RcV Z^aRTeVU Sj VgV_ed hYZTY RcV YZXY]j f_TVceRZ_R_U TR__`e SV acvUZTeVU*

KYV: `^aR_jsd eRi cVefc_d RcV dfS[VTe e` `_)X`Z_X cVgZVh R_U ViR^Z_ReZ`_Sj gRcZ`fd eRi RfeY`cZeZVd* KRi RfeY`cZeZVd ^Rj _`e RXcVV hZeY evVecVRe^V_e `W ZeV^d cVa`ceVU Z_ eYV: `^aR_jsd eRi cVefc_d(R_U eYVcvW`cv eYV `feT`^V `W eRi cVgZVhd R_U ViR^Z_ReZ`_d TR_SV f_acvUZTeRS]V* KYV: `^aR_j Zd TfccV_e]j f_UVcX`Z_X eRi ViR^Z_ReZ`_d Z_ gRcZ`fd L*J* deReV R_U W`cVZX_ [fcZdUZTeZ`_d*; fcZ_X eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /, (.,.,(eYV: `^aR_j cVRTYVU R WZ_R] dVee]V^V_e hZeY eYV @_eVc_R] I VgV_fV JVcgZTV W`c eYV WZdTR]j VRc V_UVU Af_V /, (.,-O Rd eYV deRefeV `W]Z^ZeReZ`_d ViaZcVU W`c eYRe j VRc* KYVcV hRd _` TYR_XV Wc`^eYV cVdf]ed eYRe eYV: `^aR_j cVT`cUVU Rd `W Af_V /, (.,., W`c eYZd ViaZcReZ`_` `W deRefeV* KYV: `^aR_j SV]ZVgVd Ze YRd Raac`acZReV]j RTTcfVU W`c eYV ViaVTeVU `feT`^V `W f_TVceRZ_eRi ^ReeVcd R_U SV]ZVgVd dfTY]ZRSZ]ZeZVd cVacVdV_e R cVRd`_RS]V ac`gZdZ`_W`c eRiVd f]eZ^ReV]j ViaVTeVU e` SV aRZU*? `hVgVc(eYV: `^aR_j ^Rj _VVU e` RTTcfV RUUZeZ`_R] Z_T`^V eRi ViaV_dV R_U Zed]ZRSZ]Zej ^Rj _VVU e` SV RU[fdeVU Rd _Vh Z_W`c^ReZ`_SVT`^Vd _`h_R_U Rd eYVdV eRi ViR^Z_ReZ`_d T`_eZ_fV e` ac`XcVdd(`c Rd dVee]V^V_ed `c]ZeZXReZ`_d `TTfc*

 $KYV: ``^aR_j \ aRZU \ Xc`dd \ Z_T`^V \ eRiVd`W \ !./\ ^Z]]Z`_R_U \ !.3\ ^Z]]Z`_UfcZ_X \ eYV \ eYcVV \ ^`_eYd \ V_UVU \ JVaeV^SVc \ /, (\ .,., \ R_U \ .,-5$

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è`dd*ILLa` T`^alVe` (I! R %%% a^W%%% lcV ecR d %%% eZ eV <1Rc R\d<> ` f a "

>I:B-)B6C6<:B:CIkH9>H8JHH>DC6C96C6ANH>HD;;>C6C8>6A8DC9>I>DC6C9G:HJAIHD; DE:G6I>DCH

@LMW HSGYOIRX# MRGPYHNRK XLI JSPPS [MRK HNWGYWWNSR ERH EREP]WMW# GSRXENRW WXEXIOIRXW XLEX GSRWXMXYXI JSV [EVH\$PSSONRK WXEXIQIRXW` [MXLMR XLI QIERWRK SJ ?IGXMSR (' 1 SJ XLI ?IGYVMXMIW 1\GLERKI - GX SJ ',) *# EW EQIRHIH !XLI _1\GLERKI - GX`"# ERH ?IGXNSR (+- SJXLI ?IGYVNXNIW -GX SJ ',))# EW EQIRHIHN -PP WXEXIQIRXW XLEX EVI RSX WXEXIQIRXW SJ LNWXSVNGEP JEGX EVI JSV [EVH\$ PSSONRK WXEXIQIRXWW @LI [SVHW_I\TIGX#`_IWXNQEXI#`_ERXNGNTEXI#`_TVIHNGX#`_FIPNIZI`ERH WNQNPEV I\TVIWWNSRW ERH ZEVNEXNSRW XLIVISJ EVI MRXIRHIH XS MHIRXMJ] JSV [EVH\$PSSOMRK WXEXIQIRXWW @LIWI WXEXIQIRXW ETTIEV MR E RYQFIV SJ TPEGIW MR XLMW HMWGYWWMSR ERH EREP JWWW ERH MRGPYHI WXEXIOIRXW VIKEVHMRK XLI MRXIRX# FIPMIJ SV GYVVIRX I\TIGXEXMSRW SJ XLI /SOTER J# MXW HMVIGXSVW SV MXW SJJNGIVW [MXL VIWTIGX XS# EQSRK SXLIV XLMRKW# XVIRHW EJJIGXNRK XLI /SQTER]aW JMRERGMEP GSRHMXMSR SV VIWYPXW SJ STIVEXMSRW# MRGPYHNRK I\TIGXIH MQTEGXW JVSQ XLI SRKSNRK RSZIP GSVSREZNVYW !_/; B50\$', `" TERHIQNG ERH VIPEXIH TYFPNG LIEPXL QIEWYVIW# XLI /SQTER]aW WXVEXIK] ERH WXVEXIKMG MRMXMEXMZIW ERH XLI SYXGSQI SJ GSRXMRKIRGMIW WYGL EW PMXMKEXMSR ERH MRZIWXMKEXMSRWM >IEHIVW EVI GEYXMSRIH XLEX ER] JSV [EVH\$PSSOMRK WXEXIQIRXW EVI RSX KYEVERXIIW SJ JYXYVI TIVJSVQERGI ERH MRZSPZI VMWOW ERH YRGIVXENRXNIW# MRGPYHNRK XLSWI VIPEXIH XS /; B50\$', % 9 SVI MRJSVQEXNSR VIKEVHNRK XLIWI VNWOW ERH YRGIVXEMRXNIW! 'QER] SJ [LMGL OE] FI EOTPMANIH F] /; B50\$', "ERH SXLIV MOTSVXERX JEGXSVW XLEX GSYPH GEYWI EGXYEP VIWYPXW XS HMJJIV OEXIVMEPP] JVSO XLSWI MR XLI JSV [EVH\$PSSONRK WXEXIQIRXW MW WIX JSVXL YRHIV XLI LIEHNRK _>NWO 2 EGXSVW` MR <EVX 5# 5XIQ ' - M MR : I [W / SVTSVEXMSRaW - RRYEP >ITSVX SR 2SVQ '&\$7 JSV XLI JNWGEP | IEV IRHIH 6YRI) &# (&(&# EW JNPIH | NXL XLI ?IGYYNXNIW ERH 1 \GLERKI / SQQNWWNSR !XLI _?1/`" SR - YKYWX ''# (&(&!XLI _(&(& 2SVQ '&\$7`"# ERH EW QE] FI YTHEXIH NR XLNW ERH SXLIV WYFWIUYIRX = YEVXIVP] > ITSVXW SR 2SVQ '&\$=\\@LI /SQTER] HSIW RSX SVHMREVNP] QEOI TVSNIGXNSRW SJ MXW JYXYVI STIVEXNRK VIWYPXW ERH YRHIVXEOIW RS SFPMKEXNSR !ERH I\TVIWWP] HUWGPENOW ER] SFPUKEXUSR" XS TYFPUGP] YTHEXI SV VIZUWI ER] JSV [EVH\$PSSOMRK WXEXIOIRXW# [LIXLIV EW E VIWYPX SJ RI [NRJSVQEXNSR# JYXYVI IZIRXW SV SXLIV [NWI# I\GITX EW VIUYNVIH F] PE [% > IEHIVW WLSYPH GEVIJYPP] VIZNI [XLMW HSGYQIRX ERH XLI SXLIV HSGYQIRXW JMPIH F] XLI /SQTER] [NXL XLI ? 1 /N @LMW WIGXMSR WLSYPH FI VIEH XSKIXLIV [NXL XLI YREYHMXIH GSRWSPMHEXIH JMRERGNEP WXEXIQIRXW SJ : I [W / SVTSVEXNSR ERH VIPEXIH RSXIW WIX JSVXL IPWI [LIVI LIVINR ERH XLI EYHNXIH GSRWSPNHEXIH JMRERGNEP WXEXIQIRXW SJ: I [W / SVTSVEXMSR ERH VIPEXIH RSXIW WIX JSVXL MR XLI (&(& 2SVQ '&\$7\mathbb{N}

>CIGD9J8I>DC

 $EV hd : `ca`cReZ`_ we` XVeYVc hZeY Zed df SdZUZRcZVd(qEV hd : `ca`cReZ`_(rqEV hd : `ca(reYVq:`^aR_j(rqhV(r`cqfdr&ZdRX)`SR) UZgVcdZWZVU ^VUZR R_U Z_W`c^ReZ`_ dVcgZTVd T`^aR_j T`^acZdVU`W SfdZ_VddVd RTc`dd R cR_XV`W^VUZR (Z_T]fUZ_X6 UZXZeR] cVR] VdeReV dVcgZTVd(df SdTcZaeZ`_ gZUV` dVcgZTVd Z_ 8 fdecR]ZR(_Vhd R_U Z_W`c^ReZ`_ dVcgZTVd R_U S``\ af S]ZdYZ_X*$

; fcZ_X eYV W` fceY bfRceVc `W WZdTR] . , . , (Z_T`__VTeZ`_ hZeY eYV : `^aR_j &dR]V `W Zed EV hd 8 ^VcZTR DRc\VeZ_X cVa`ceZ_X f_Ze R_U Zed R__fR] cVgZV h `W Zed cVa`ceRS]V dVX ^V_ed(eYV : `^aR_j UVeVc^Z_VU e` UZdRXXcVXReV Zed ; `h A`_Vd`aVcReZ_X dVX ^V_e Rd R dVaRcReV cVa`ceRS]V dVX ^V_e Z_RTT`cUR_TV hZeY 8 TT` f_eZ_X JeR_URcU : `UZWZTReZ`_ \(\pa_8 \] : r\(\pa_4 \), (qJVX ^V_e I Va`ceZ_X dVX ^V_e Rd R dVaRcReV cVa`ceRS]V dVX ^V_e Z_RTZR] Z_W`c^ReZ`_ \(\pa_6 \) ceYZd `aVcReZ_X dVX ^V_e hRd RXXcVXReVU hZeY eYV SfdZ_VddVd hZeYZ_eYV EV hd DVUZR `aVcReZ_X dVX ^V_e R_U(e`XVeYVc(W`c^VU eYV EV hd R_U \(\hat{0} \) W`c^ReZ`_ JVcgZTVd cVa`ceRS]V dVX ^V_e* = `]]` hZ_X eYV dR]V `\W Zed EV hd 8 ^VcZTR DRc\VeZ_X SfdZ_Vdd Z_eYV \(\hat{0} \) fceY bfRceVc `\W \(\hat{0} \) W\(\hat{0} \) T\(\hat{0} \) [f_TeZ`_ hZeY eYV : `^aR_j sd R__fR] SfUXVeZ_X ac`TVdd(eYV : `^aR_j UVeVc^Z_VU eYRe RXXcVXReZ`_ hRd _`]`_XVc Raac`acZReV Rd TVceRZ_`\ \\ eYV cV^RZ_Z_X SfdZ_VddVd _`]`_XVc dYRcVU dZ^Z]Rc VT`_`^AT TYRcRTeVcZdeZTd* 8 d R cVdf]e(eYV : `^aR_j YRd cVgZdVU Zed YZde`cZTR] UZdT]`dfcVd \(\hat{0} \) c eYV acZ`c aVcZ`U e` cVW|VTe eYV Vh ; `h A` Vd R U EVhd DVUZR cVa`ceRS]V dVX^V ed*

: VceRZ_ cVT]RddZWZTReZ`_d YRgV SVV_ ^RUV e` eYV acZ`c aVcZ`U T`_d`]ZUReVU WZ_R_TZR] deReV^V_ed e` T`_W`c^ e` eYV TfccV_e jVRc acVdV_eReZ`_* JaVTZWZTR]]j(eYV : `^aR_j cVT]RddZWZVU TVceRZ_ T`ded Re eYV FeYVc dVX^V_e eYRe hVcV acVgZ`fd]j Z_T]fUVU hZeYZ_ JV]]Z_X(XV_VcR] R_U RU^Z_ZdecReZgV e` FaVcReZ_X ViaV_dVd* =`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(., -5(eYVdV cVT]RddZWZTReZ`_d Z_TcVRdVU FaVcReZ_X ViaV_dVd Sj !- ^Z]]Z`_*

 $KYV \ f_RfUZeVU\ T^_d^]ZUReVU\ WZ_R_TZR] \ deReV^V_ed\ RcV\ cVWVccVU\ e^YVcVZ_Rd\ eYV\ q: `_d^]ZUReVU\ =Z_R_TZR] \ JeReV^V_ed^r\ KYV \ T^_d^]ZUReVU\ deReV^V_ed^W \ aVcReZ^_d\ RcV\ cVWVccVU\ e^YVcVZ_Rd\ eYV\ qJeReV^V_ed^W \ FaVcReZ^_d^r\ KYV\ T^_d^]ZUReVU\ SR]R_TV\ dYVVed^r\ KYV\ T^_d^]ZUReVU\ deReV^V_ed^W \ TRdY\ W]^hd\ RcV\ cVWVccVU\ e^YVcVZ_Rd\ eYV\ qJeReV^V_ed^W: RdY=]^hd^r\ KYV: ^_d^]ZUReVU\ =Z_R_TZR]\ JeReV^V_ed\ W: RdY=]^hd^r\ KYV: ^_d^]ZUReVU\ =Z_R_TZR]\ JeReV^V_ed\ YRgV\ SVV_acVaRcVU\ Z_RTT^cUR_TV\ hZeY\ XV_VcR]]j\ RTTVaeVU\ RTT^f_eZ_X\ acZ_TZa]Vd\ Z_eYV\ L_ZeVU\ JeReVd^W \ 8^VcZTR\ Mq>8\ Gr\&^*$

- 7?LNEML H@ 51?K; MCHGL p KYZd dVTeZ`_ ac`gZUVd R_ R_R]jdZd `WeYV : `^aR_jsd cVdf]ed `W`aVcReZ`_d W`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(.,., R_U ., -5* KYZd R_R]jdZd Zd acVdV_eVU`_ S`eY R T`_d`]ZUReVU SRdZd R_U R dVX^V_e SRdZd* J faa]V^V_eR] cVgV_fV Z_W`c^ReZ`_ Zd R]d` Z_T]fUVU W`c cVa`ceZ_X f_Zed h ZeYZ_TVceRZ_dVX^V_ed R_U Zd acVdV_eVU`_ R Xc`dd SRdZd(SVW`cV V]Z^Z_ReZ`_d Z_T`_d`]ZUReZ`_* @_RUUZeZ`_(R ScZVW UVdTcZaeZ`_ Zd ac`gZUVU`W dZX_ZWZTR_e ecR_dRTeZ`_d R_U VgV_ed eYRe Z^aRTe eYV T`^aRcRSZ]Zej`WeYV cVdf]ed SVZ_X R_R]jkVU*
- T 2CJNC>CMR;G>,;ICM;E 7?LHNK=?L p KYZd dVTeZ`_ ac`gZUVd R_ R_R]jdZd`W eYV : `^aR_jsd TRdY W]`hd W`c eYV eYcVV
 ^`_eYd V_UVU JVaeV^SVc /,(.,., R_U .,-5(Rd hV]] Rd R UZdTfddZ`_ `W eYV : `^aR_jsd WZ_R_TZR] RccR_XV^V_ed R_U
 `fedeR_UZ_X T`^^Ze^V_ed(S`eY WZc^R_U T`_eZ_XV_e(eYRe ViZdeVU Rd`W JVaeV^SVc /,(.,.,*

DK:GK>: L D; I=: 8DBE6CNkH7JH>C:HH:H

 $KYV : `^aR_j ^R_RXVd R_U cVa`ced Zed SfdZ_VddVd Z_eYV W`]]`hZ_X dZi dVX^V_ed6$

m - CACM; E 7?; E. LM; M? 8?KOC=?L p KYV ; ZXZeR] I VR] < deReV J VcgZTVd dVX ^ V_e T `_dZded `W eYV : `^aR_j sd 2-*2 " Z_eVcVde Z_ I < 8 >c`fa R_U 4, " Z_eVcVde Z_ D`gV* KYV cV ^ RZ_Z_X ., " Z_eVcVde Z_ D`gV Zd YV]U Sj I < 8 >c`fa* I < 8 >c`fa Zd R ^ Rc \ Ve)]VRUZ_X UZXZeR] ^ VUZR SfdZ_Vdd da VTZR]ZkZ_X Z_ ac`a Vcej R_U Zd]ZdeVU `_ eYV 8 fdecR]ZR_ J VT fcZeZVd

. E;K;

 $_Vh\,daRaVcd\,Z_\,\,8\,fdecR]ZR^*\,\,KYV\,\,Z^{\,\,}aRTe\,\,`W\,\,W^{\,\,}cVZX_\,\,TfccV_Tj\,\,W]fTe\,fReZ^{\,\,}_d\,\,`W\,\,eYV\,\,L^*J^*\,\,U^{\,\,}]]Rc\,\,RXRZ_de\,\,]^{\,\,}TR]\,\,TfccV_TZVd\,\,cVd\,f]eVU\,\,Z_\,\,R_de\,\,A$

8?AF?GN *G; ERLCL

 $JVX ^V_e < 90K ; 8 Zd UVWZ_VU Rd cVgV_fVd]Vdd ^aVcReZ_X ViaV_dVd R_U dV]]Z_X(XV_VcR] R_U RU ^Z_ZdecReZgV ViaV_dV^* JVX ^V_e < 90K ; 8 U^Vd_^e Z_T] fUV6 UVacVTZReZ^_R_U R^^ceZkReZ^_(Z^aRZc^V_e R_U cVdecfTefcZ_X TYRcXVd(VbfZej]^ddVd^W RWWZ]ZReVd(Z_eVcVde %ViaV_dV&Z_T^^V(Ue(^eYVc(_Ve R_U Z_T^^V eRi %ViaV_dV&SV_VWZe^* JVX^V_e < 90K ; 8 ^Rj_^e SV T^^aRcRS]V e^*$

$ KYV \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$							

8N<L=KCINCHG: C>?H 8?KOC=?L %./" R_U .." `W eYV : `^aR_j sd T`_d`]ZUReVU cVgV_fVd Z_eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(.,., R_U .,-5(cVdaVTeZgV]j&

	;_b dXU dXbUU]_^dXc U^TUT HU`dU] RUb .+'			
	-+-+	-+,4	8XQ^WU	" 8XQ^WU
%Z_ ^Z]]Z`_d(ViTVae " &	_		7 UddUb*	\$ L _bcU%
IVgV_fVd6				
: ZcTf]ReZ`_ R_U dfSdTcZaeZ`_	! 0/3	! 01-	! %-O&	%/&"
8 UgVceZdZ_X	1,	1-	% – &	%.&"
FeYVc	5		%/&	%.1&"
I_dQ\ GUfU^eUc	/41	0,/	\$,3%	\$/%"
FaVcReZ_X ViaV_dVd	%///&	%/OO&		/ "
JV]]Z_X(XV_VcR] R_U RU^Z_ZdecReZgV	%41&	%45&	0	0 "
HUW] U^d: 7>I 96	! 23	! 3,	! \$.%	\$/%"

 $= \c eYV \ eYcVV \ ^ = \c eYV \ J \ eVCVV \ ^ = \c eYV \ J \ eVCVV \ ^ = \c eYV \ J \ eVCVVV \ ^ = \c eYV \ J \ eVCVVV \ ^ = \c eYV \ J \ eVCVVV \ ^ = \c eVV \ J \ eVCVVV \ - \c eVV \$

=`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(.,.,(JVX^V_e < 9@K; 8 UVTcVRdVU !/ ^Z]]Z`_(`c O "(Rd T` ^aRcVU e` eYV T`ccVda`_UZ_X aVcZ`U `W WZdTR].,.,* KYV JVX^V_e < 9@K; 8 UVTcVRdV hRd acZ^RcZ]j UfV e` eYV]`hVc cVgV_fVd UZdTfddVU RS`gV(aRceZR]]j `\WdVe Sj T`de dRgZ_Xd acZ^RcZ]j UfV e`]`hVc V_eVceRZ_^V_e ac` fTed(acZF

- K`eR] R_U GRZU = `ieV] E`h dfSdTcZSVcd Rd `W JVaeV ^SVc /,(. , . , R_U . , -5* GRZU = `ieV] E`h dfSdTcZSVcd ViT]fUVd Tfde` ^Vcd cVTVZgZ X dVcgZTV W`c ` TYRcXV f UVc TVceRZ Vh dfSdTcZSVc ac` ^ eZ` d*
- K`eR] R_U GRZU BRj` dfSdTcZSVcd Rd`W JVaeV^SVc /,(.,., R_U.,-5* GRZU BRj` dfSdTcZSVcd ViT]fUVd Tfde`^Vcd cVTVZgZ_X dVcgZTV W`c_` TYRcXV f_UVc TVceRZ__Vh dfSdTcZSVc ac`^`eZ`_d*
- K`eR] R_U GRZU 9Z_XV dfSdTcZSVcd Rd`W JVaeV^SVc /,(. , . ,* 9Z_XV hRd]Rf_TYVU`_ DRj .1(. , . ,* GRZU 9Z_XV dfSdTcZSVcd ViT]fUVd Tfde`^Vcd cVTVZgZ_X dVcgZTV W`c _` TYRcXV f_UVc TVceRZ__Vh dfSdTcZSVc ac`^`eZ`_d*
- 8 gVcRXV ^`_eY]j Sc`RUTRde cVdZUV_eZR] dfSdTcZaeZ`_ cVgV_fV aVc fdVc %ViT]fUZ_X Faefd& %9c`RUTRde 8 IGL& W`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(..., R_U ., -5*
- 9c RUTRde cVdZUV_eZR] dfSdTcZSVc TYfc_ cReV %ViT]fUZ_X Faefd& %9c RUTRde JfSdTcZSVc : Yfc_& W`c eYV eYcVV ^`_eYd V_UVU JVaeV ^SVc /,(.,., R_U .,-5* 9c RUTRde dfSdTcZSVc TYfc_ cVacVdV_ed eYV _f ^SVc `W TRS]V R_U dReV]]ZeV cVdZUV_eZR] dfSdTcZSVcd h Y`dV dVcgZTV Zd UZdT` __VTeVU(Vi acVddVU Rd R aVcTV_eRXV `W eYV RgVcRXV e`eR] _f ^SVc `W TRS]V R_U dReV]]ZeV cVdZUV_eZR] dfSdTcZSVcd(acVdV_eVU `_ R_ R_ fR] SRdZd*

- HP 1HG?L %-4 " R_U -2 " `W eYV : ` ^ aR_j sd T`_d`]ZUReVU cVgV_fVd Z_ eYV eYcVV ^ `_eYd V_UVU JVaeV ^ SVc / ,(. , . , R_U . , -5(cVdaVTeZgV]j &

	;_b dXU d	;_b dXU dXbUU]_^dXc U^TUT HU`dU] RUb .+'			
	-+-+	-+,4	8 XQ^WU	'' 8XQ^WU	
%Z_ ^Z]]Z`_d(ViTVae " &			7UddUb*	\$ L _bcU%	
IVgV_fVd6					
: ZcTf]ReZ`_ R_U dfSdTcZaeZ`_	! /	! .45	!	4 "	
8 UgVceZdZ_X	3,	40	% - O &	%-3& "	
FeYVc	1_	5	%O&	%OO& ''	
I_dQ\ GUfU^eUc	.31	.3-	1	, "	
FaVcReZ_X ViaV_dVd	%-41&	%-43&	•	- "	
JV]]Z_X(XV_VcR] R_U RU^Z_ZdecReZgV	%5&	%-02&	-3	"	
HUW] U^d: 7>196	! 2-	! /4	!	/2 "	

 $= \c eYV \ eYcVV \ ^ = \c eYV \ eV_UVU \ JVaeV \ SVc \ /, (\c, ..., (\cVgV_fVd \ Re \ eYV \ ; \ h \ A^_Vd \ dVX \ ^V = \c Z_TcVRdVU \ !O \ ^Z]]Z \ _(\c - " (\Rd \ T^ \ aRcVU \ e^ eYV \ T^ ccVda \ _UZ_X \ aVcZ^ U \ ^W \ WZdTR] \ ., ., UcZgV_S j Xc \ heY Z_TzcTf]ReZ \ _R_U \ dfSdTcZaeZ \ _cVgV_fVd \ (aRceZR]]j \ ^WWdve S j R UVT]Z_V Z_ acZ_e RUgVceZdZ_X cVgV_fVd* ; ZXZeR] cVgV_fVd Re eYV ; \ h \ A^_Vd \ dVX \ ^V_e \ cVacVdV_eVU 3/ " \ ^W \ e^ eR] cVgV_fVd \ W^ c \ eYV \ eYcVV \ ^-eYd \ V_UVU \ JVaeV \ ^SVc \ /, (\c, ..., (Rd \ T^ \ ^aRcVU \ e^ Z1 " \ Z_eYV \ T^ ccVda \ _UZ_X \ aVcZ^ U \ ^W \ WZdTR] \ ., ., * KYV Z^ aRTe \ ^W \ ^CVZX_U \ YUVU \ JVaeV \ ^SVc \ /, (\c, ..., Rd \ T^ \ ^aRcVU \ e^ eYV \ T^ ccVda \ _UZ_X \ aVcZ^ U \ ^W \ WZdTR] \ ., ., *$

/MVGYPEXMSR ERH WYFWGVMTXMSR VIZIRYIW

	;_b dXU dXbUU]_^dXc U^TUT HU`dU] RUb .+'			
	-+-+	-+,4	8XQ^WU	'' 8XQ^WU
%Z_ ^Z]]Z`_d(ViTVae " &			7 UddUb*	\$ L _bcU%
: ZcTf]ReZ`_ R_U dfSdTcZaeZ`_ cVgV_fVd6				
: ZcTf]ReZ`_ R_U `eYVc	! -54	! -34	! .,	"
Gc`WVddZ`_R] Z_W`c^ReZ`_ SfdZ_Vdd	/			. "
I_dQ\ SYbSe\QdY_^ Q^T ceRcSbY`dY_^ bUfU^eUc	! .,,	! -34	!	3 "

: ZcTf]ReZ`_ R_U dfSdTcZaeZ`_ cVgV_fVd Z_TcVRdVU ! . . ^Z]]Z`_(`c 4 " (UfcZ_X eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(, , , Rd T`^aRcVU e` eYV T`ccVda`_UZ_X aVcZ`U `W WZdTR] . , , ,* : ZcTf]ReZ`_ R_U `eYVc cVgV_fVd Z_TcVRdVU ! . , ^Z]]Z`_(`c -- " (acZ^RcZ]j UcZgV_ Sj Xc`heY Z_UZXZeR])`_]j dfSdTcZaeZ`_d Re @LI CEPP ?XVIIX 6SYVREP R_U R !3 ^Z]]Z`_ Z_TcVRdV Z_T`_eV_e]ZTV_dZ_X cVgV_fVd(aRceZR]]j `\WdVe Sj acZ_e g`]f^V UVT]Z_Vd*; fcZ_X eYV eYcVV ^`_eYd V_UVU

+HHD 6N<ECLBCGA %.. " R_U -3 " `W eYV : ` ^aR_j sd T`_d`]ZUReVU cVgV_fVd Z_ eYV eYcVV ^ `_eYd V_UVU JVaeV^SVc /,(.,., R_U I .,-5(cVdaVTeZgV]j &

	;_b dXU	;_b dXU dXbUU]_^dXc U^TUT HU`dU] RUb .+'			
	-+-+	-+,4	8XQ^WU	'' 8XQ^WU	
%Z_ ^Z]]Z`_d(Vi TVae '' &			7 UddUb*	L_bcU%	
IVgV_fVd6					
: `_df ^ Vc	! 00-	! /43	! 10	-0 "	
FeYVc		-4	% - &	%2& "	
I_dQ\ GUfU^eUc	/03	/+0	0.	,. "	
FaVcReZ_X ViaV_dVd	%/,0&	%.35&	%.1&	%5& ''	
JV]]Z_X(XV_VcR] R_U RU^Z_ZdecReZgV	% 4 _/ &	Y H %33&	%2&	%4& ''	
HUW] U^d: 7>I96	! 2,	! /4	!	/0 ''	

Z^aRTe `W W`cVZX_ TfccV_Tj W]fTefReZ`_d `W eYV L*J* U`]]Rc RXRZ_de]`TR] TfccV_TZVd cVdf]eVU Z_ R cVgV_fV Z_TcVRdV `W !-5 ^Z]]Z`_(
`c . "(W`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(.,., Rd T`^aRcVU e` eYV T`ccVda`_UZ_X aVcZ`U `W WZdTR] .,.,*

JVX^V_e < 9 @K; 8 Re eYV EV hd DVUZR dVX^V_e UVT]Z_VU ! .5 ^Z]]Z`_ W`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /, (. , . , Rd T` ^aRcVU e` eYV T`ccVda`_UZ_X aVcZ`U `W WZdTR] . , . , * KYV UVTcVRdV hRd UfV e` eYV _Ve ! - . ^Z]]Z`_ Z^aRTe Wc` ^ eYV dR]Vd`W EV hd 8 ^VcZTR DRc\VeZ_X R_U L_cf]j Z_ WZdTR] . , . , R_U e`]` hVc T`_ecZSfeZ`_d Wc` ^ EV hd : `ca 8 fdecR]ZR R_U EV hd LB `W ! - / ^Z]]Z`_ R_U !5 ^Z]]Z`_ (cVdaVTeZgV]j(acZ^RcZ]j UcZgV_Sj]` hVc cVgV_fVd(aRceZR]]j `\WWdVe Sj T`de dRgZ_Xd Z_ZeZReZgVd*

: I [W / SVT - YWXVEPNE

Tf^SVcd`^V UfV e`]`TR] cVXf]ReZ`_d(W`cVZX_ ViTYR_XV T`_ec`]d R_U eRiVd* 8 UUZeZ`_R]]j(eYV ecR_dWVc `W Wf_Ud Wc`^ W`cVZX_ [fcZdUZTeZ` d ^Rj cVdf]e Z YZXYVc VWWVTeZgV eRi cReVd R U YZXYVc TRdY aRZU W`c Z T`^V eRiVd W`c eYV : `^aR j*

 $KYV \ acZ_TZaR] \ fdVd ``W \ TRdY \ eYRe \ RWWVTe \ eYV : ``aR_j \ sd \]Zb \ fZUZej \ a`dZeZ`_Z_T]fUV \ eYV \ W`]]`hZ_X6`aVcReZ`_R] \ Vi \ aV_UZefcVd \\ Z_T]fUZ_X \ V`a]`jVV \ T`ded \ R_U \ aRaVc \ afcTYRdVd7 \ TRaZeR] \ Vi \ aV_UZefcVd7 \ Z_T``^V \ eRi \ aRj `V_ed7 \ Z_gVde^V_ed \ Z_Rdd`TZReVU \ V_eZeZVd7 \\ RTb \ fZdZeZ`_d7 \ R_U \ eYV \ cVaRj ^V_e ``W UVSe \ R_U \ cV]ReVU \ Z_eVcVde* @_RUUZeZ`_e` eYV \ RTb \ fZdZeZ`_d \ R_U \ UZda`dZeZ`_d \ UZdT]` dVU \ V]dV \ h \ YVcV(eYV : ``aR_j \ YRd \ VgR] \ fReVU \ R_U \ Vi \ aVTed \ e` \ VgR] \ fReV(a`ddZS]V \ WfefcV \ RTb \ fZdZeZ`_d \ R_U \ UZda`dZeZ`_d` \ W \ TVceRZ_SfdZ_VddVd* \ J \ fTY \ ecR_dRTeZ`_d ^Rj \ SV ^ReVcZR] \ R_U \ ^Rj \ Z_g`]gV \ TRdY(eYV \ Zdd \ fR_TV ``W \ eYV : ``aR_j \ sd \ dVTfcZeZVd`c \ eYV \ Rdd \ f`aeZ`_`` \ XZ_UVSeVU_Vdd*$

OLLN?K 6NK=B;L?L H@ . JNCNR 8?=NKCNC?L

KYV : ` ^ aR_j UZU _ `e afcTYRdV R_j `W Zed :]Rdd 8 : ` ^ ^ ` _ Je ` T \ `c :]Rdd 9 : ` ^ ^ ` _ Je ` T \ UfcZ_X eYV eYcVV ^ `_eYd V_UVU JVaeV ^ SVc / , (, , , , R U . , -5*

- (OC>?G>L

@_ 8 fXfde .,.,(eYV : `^aR_jsd 9`RcU`W ; ZcVTe`cd %qeYV 9`RcU`W ; ZcVTe`cdr& UVT]RcVU R dV^Z)R__fR] TRdY UZgZUV_U`W !,*-, aVc dYRcV W`c :]Rdd 8 : `^^^_ Je`T\ R_U :]Rdd 9 : `^^^_ Je`T* KYZd UZgZUV_U hRd aRZU`_ FTe`SVc -O(.,., e`de`T\Y`]UVcd `W cVT`cU Rd`W JVaeV^SVc -2(.,.,* KYV eZ^Z_X(UVT]RcReZ`_(R^`f_e R_U aRj^V_e `W WfefcV UZgZUV_Ud e`de`T\Y`]UVcd(ZW R_j(Zd hZeYZ_eYV UZdTcVeZ`_ `W eYV 9`RcU`W ; ZcVTe`cd* KYV 9`RcU`W ; ZcVTe`cds UVTZdZ`_d cVXRcUZ_X eYV aRj^V_e `W WfefcV UZgZUV_Ud hZ]] UVaV_U`_ ^R_j WRTe`cd(Z_T]fUZ_X eYV : `^aR_jsd WZ_R_TZR] T`_UZeZ`_(VRc_Z_Xd(TRaZeR] cVbfZcV^V_ed R_U UVSe WRTZ]Zej T`gV_R_ed(`eYVc T`_ecRTefR] cVdecZTeZ`_d(Rd hV]] Rd]VXR] cVbfZcV^V_ed(cVXf]Re`cj T`_decRZ_ed(Z_Ufdecj acRTeZTV(^Rc\Veg`]ReZ]Zej R_U`eYVc WRTe`cd eYRe eYV 9`RcU`W ; ZcVTe`cd UVV^d cV]VgR_e*

;_b dXU dXbUU]_^dXc U^TUT HU`dU] RUb .+' -+-,4

EVe TRdY ac`gZUVU S j`aVcReZ_X RTeZgZeZVd ! -11 ! .3

EVe TRdY ac`gZUVU Sj`aVcReZ_X RTeZgZeZVd Z_TcVRdVU Sj !- .4 ^Z]]Z`_ W`c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(.,., Rd T` ^aRcVU e` eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(.,-5* KYV Z_TcVRdV hRd acZ^RcZ]j UfV e` YZXYVc K`eR] JVX^V_e < 9@K; 8 R U]`hVc h`c\Z X TRaZeR]*

EVe TRdY fdVU Z_ Z_gVdeZ_X RTeZgZeZVd W`c eYV eYcVV ^`_eYd V_UVU JVaeV ^ SVc / ,(. , . , R_U . , -5 hRd Rd W`]]`hd %Z_ ^Z]]Z`_d&6

;_b dXU dXbUU]_^dXc U^TUT HU`dU] RUb .+' -+-,4

EVe TRdY fdVU Z_ Z_gVdeZ_X RTeZgZeZVd ! %52&! %--4&

EVe TRdY fdVU Z_ Z_gVdeZ_X RTeZgZeZVd UVTcVRdVU Sj !.. ^Z]]Z`_ \(\tilde{\text{W}}\) c eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(., ., (Rd T` ^aRcVU e` eYV eYcVV ^`_eYd V_UVU JVaeV ^SVc /,(., ., ., (eYV : ` ^aR_j fdVU !5/ ^Z]]Z`_ \(\tilde{\text{W}}\) TRdY \(\text{W}\) c TRaZeR] Vi aV_UZefcVd(\(\text{W}\) h YZTY !1- ^Z]|Z`_ cV|ReVU e` = `ieV|*

; fcZ_X eYV eYcVV ^`_eYd V_UVU JVaeV ^SVc / ,(. , -5(eYV : ` ^aR_j fdVU !--3 ^Z]]Z`_ `W TRdY W`c TRaZeR] Vi aV_UZefcVd(`W h YZTY !22 ^Z]]Z`_ cV]ReVU e` = `i eV]*

EVe TRdY fdVU Z_ WZ_R_TZ_X RTeZgZeZVd W`c eYV eYcVV ^`_eYd V_UVU JVaeV ^ SVc / ,(. , . , R_U . , -5 hRd Rd W`]]`hd %Z_ ^Z]]Z`_d&6

; fcZ_X eYV eYcVV ^`_eYd V_UVU JVaeV^SVc /,(., -5(eYV : `^aR_j cVaRZU !.5, ^Z]]Z`_ `W S`cc` hZ_Xd cV]ReVU e` = `ieV] R_U
^RUV UZgZUV_U aRj ^V_ed `W !.. ^Z]]Z`_ e` I < 8 > c` fa ^Z_`cZej de`T\Y`]UVcd* KYV _Ve TRdY fdVU Z_ WZ_R_TZ_X RTeZgZeZVd W`c eYV
eYcVV ^`_eYd V_UVU JVaeV^SVc /,(., -5 hRd aRceZR]]j `WWdVe Sj _Vh S`cc` hZ_Xd cV]ReVU e` = `ieV] `W !-55 ^Z]]Z`_ R_U eYV _Ve
dVee]V ^V_e `W YYUXVd `W !13 ^Z]]Z`_*

7?=HG=CEC; MCHG H@ /K?? , ;LB /EHP *0;CE; <E? MH 4?PL , HKIHK; MCHG

		;_b dXU dXbUU]_^dXc U^TUT HU`dU] RUb .+'			
		-+-+			
		\$Y^] Y\\Y_^c%			
EVe TRdY ac`gZUVU Sj `aVcReZ_X RTeZgZeZVd	!	-11	!	.3	
CVdd6 : RaZeR] ViaV_UZefcVd		%5/&		%3&	
		2.		%5,&	
CVdd6 $I < 8 > c$ fa WcVV TRdY W] h		%.5&		%.4&	
G]fd6 : RdY UZgZUV_Ud cVTVZgVU Wc`^ I $<$ 8 $>$ c`fa		/.		/1	
=cVV TRdY ₩]`h RgRZ]RS]V e` EVhd : `ca`cReZ`_	!	21	!	%4/&	

=cVV TRdY W]`h RgRZ]RS]V e` EVhd : `ca`cReZ`_ Z_TcVRdVU Sj !-O4 ^Z]]Z`_ Z_ eYV eYcVV

 $I < 8 > c`fa YRd RTTVdd e`R_8!., ^Z]]Z`_`gVcUcRWe WRTZ]Zej \%eYV q.,., FgVcUcRWe = RTZ]Zej Zd R_f_T`^^ZeeVU WRTZ]Zej eYRe hZ]] SV cVgZV hVU R__fR]]j Sj eYV]V_UVc R_U SVRcd Z_eVcVde Re R cReV SRdVU `_ eYV]V_UVcsd SV_TY^Rc\S`cc`hZ_X cReV]Vdd R UZdT`f_e`W O*.."* KYV .,., FgVcUcRWe = RTZ]Zej TRccZVd R_R_fR] WRTZ]Zej WVV `W ,*-1" `W eYV 8!., ^Z]]Z`_$

IQR\U V 8 ^dU^dc

>I:B /) 8DCIGDAH 6C9 EGD8:9JG:H

\$Q\\ 9\\\c\$_cebU 8_^db_\c Q^T Eb_\$UTebUc

 $KYV: `^aR_j sd ^R_RXV^V_e (hZeY eYV aRceZTZaReZ^-_`W eYV: ^aR_j sd : YZVW < iVTfeZgV FWWZTVc R_U: YZVW = Z_R_TZR] FWWZTVc (YRd VgR]fReVU eYV VWWVTeZgV_Vdd `W eYV: ^aR_j sd UZdT]`dfcV T`_ec`]d R_U ac`TVUfcVd %Rd dfTY eVc^Zd UVWZ_VU Z_I f]Vd -/R)-1%V& R_U -1%U&)-1%V& f_UVc eYV JVTfcZeZVd < iTYR_XV 8 Te`W -5/0(Rd R^V_UVU %eYV q< iTYR_XV 8 Ter&& Rd`W eYV V_U`W eYV aVcZ`U T`gVcVU Sj eYZd bfRceVc]j cVa`ce* 9 RdVU`_dfTY VgR]fReZ`_(eYV: ^aR_j sd : YZVW < iVTfeZgV FWWZTVc R_U: YZVW = Z_R_TZR] FWWZTVc YRgV T`_T]fUVU eYRe(Rd`W eYV V_U`W dfTY aVcZ`U(eYV: ^aR_j sd UZdT]`dfcV T`_ec`]d R_U ac`TVUfcVd hVcV VWWVTeZgV Z_cVT`cUZ_X(ac`TVddZ_X(df^^RcZkZ_X R_U cVa`ceZ_X(`_R eZ^V]j SRdZd(Z_W`c^ReZ`_cVbfZcVU e` SV UZdT]`dVU Sj eYV: ^aR_j Z_eYV cVa`ced eYRe Ze WZ]Vd`c dfS^Zed f_UVc eYV < iTYR_XV 8 Te R_U hVcV VWWVTeZgV Z_V_dfcZ_X eYRe Z_W`c^ReZ`_cVbfZcVU e` SV UZdT]`dVU Sj eYV: ^aR_j Z_eYV cVa`ced Ze WZ]Vd`c dfS^Zed f_UVc eYV < iTYR_XV 8 Te Zd RTTf^f]ReVU R_U T`^^fZTReVU e` eYV : ^aR_j sd ^R_RXV^V_e(Z_T]fUZ_X eYV: ^aR_j sd : YZVW < iVTfeZgV FWWZTVc R_U: YZVW = Z_R_TZR] FWWZTVc(Rd Raac`acZReV e` R]]`h eZ^V]j UVTZdZ`_d cVXRcUZ_X cVbfZcVU UZdT]`dfcV*$

$R\% >^dUb^Q\ 8_^db_\ DfUb; Y^Q^SYQ\ GU^_bdY^W$

 $KYVcV\ YRd\ SVV_\ `TYR_XV\ Z_eYV\ : \ `aR_j\ sd\ Z_eVc_R]\ T`_ec`\]\ `gVc\ WZ_R_TZR]\ cVa\ `ceZ_X\ \%Rd\ dfTY\ eVc\ ^Zd\ UVWZ_VU\ Z_I\ f]Vd\ -/R)-1\%W\&\ R_U\ -1\%U\&)-1\%W\&\ f_UVc\ eYV\ < iTYR_XV\ 8\ Te\&\ UfcZ_X\ eYV\ : \ `aR_j\ sd\ WZcde\ bfRceVc\ `W\ WZdTR]\ .\ , .\ -\ eYRe\ YRd\ ^ReVcZR]\ j\ RWWVTeVU(\ `c\ Zd\ cVRd\ `_RS]\ j\ Z_V]\ j\ e\ `\ ^ReVcZR]\ j\ RWWVTe(\ eYV\ : \ `aR_j\ sd\ Z_eVc_R]\ T`_ec\]\ gVc\ WZ_R_TZR]\ cVa\ `ceZ_X*$

E6GI >>

>I:B, A:<6AEGD8::9>C<H

JVV E`eV 5 p: `^^Ze^V_ed R_U: `_eZ_XV_TZVd Z_ eYV RTT`^aR_jZ_X: `_d`]ZUReVU =Z_R_TZR] JeReV^V_ed*

>I:B,6)G>H@;68IDGH

KYVcV YRgV SVV__` ^ReVcZR] TYR_XVd e` eYV cZd\ WRTe`cd UVdTcZSVU Z_eYV : `^aR_jsd . , . , =`c^ - ,)B(ViTVae Rd dVe W`ceY SV]`h6

/ IVXENR 2 / / >YPIW ERH > IKYPEXNSRW ERH XLI ?ITEVEXNSR ERH OMWXVNFYXNSR - KVIIQIRX 9 E] > IWXVNGX XLI / SQTER] 2VSQ - GUYNVNRK SV ; [RNRK / IVXENR @ | ITIW SJ - WWIXW MR XLI A % 2%

KYV =VUVcR] : ` ^ ^ f_ZTReZ`_d : ` ^ ^ZddZ`_ %q=: r % YRd ac ^ f]XReVU TVceRZ_cf]Vd R_U cVXf]ReZ`_d eYRe]Z ^Ze eYV T` ^ ^ ` h_VcdYZa `W cRUZ` R_U eV]VgZdZ`_ Sc`RUTRde deReZ`_d R_U eYV T` ^ ^ ` h_VcdYZa `W Sc`RUTRde deReZ`_d R_U _VhdaRaVcd %eYV q9c`RUTRde F h_VcdYZa I f]Vdr& R_U a]RTV T` ^ ^ VcTZR] cVdecZTeZ`_d `_ R TRS]V_Veh`c\ ac`XcR ^ ^Vc Z_h YZTY R TRS]V eV]VgZdZ`_ `aVcRe`c Y`]Ud R_ ` h_VcdYZa Z_eVcVde %eYV qGc`XcR ^ 8 TTVdd I f]Vdr& @_ E`gV^SVc ., -3(eYV =: g`eVU e` V]Z^Z_ReV eYV 9c`RUTRde F h_VcdYZa I f]Vd(R_U eYV `cUVc SVTR^V VWWVTeZgV Z_=VScfRcj ., -4* ?`hVgVc(Z_JVaeV^SVc ., -5(R aR_V] `W eYV L*J* : `fce `W 8 aaVR]d W`c eYV KYZcU : ZcTfZe %eYV qKYZcU : ZcTfZer& ZddfVU R_FcUVc gRTReZ_X eYV =: sd`cUVc R_U cVZ_deReZ_X eYV 9c`RUTRde F h_VcdYZa I f]Vd* KYV =: sd aVeZeZ`_W`c V_SR_T cVgZVh hRd UV_ZVU Z_E`gV^SVc ., -5(W`]]`hZ_X hYZTY R ^R_UReV cVZ_deReZ_X eYV 9c`RUTRde F h_VcdYZa I f]Vd hRd ZddfVU* KYV =: : R_U TVceRZ_`eYVc aRceZVd WZ]VU GVeZeZ`_d W`c NcZe`W : VceZ`cRcZ hZeY eYV L*J* J facV^V : `fce RaaVR]Z_X eYV KYZcU : ZcTfZesd UVTZdZ`_ hYZTY hVcV XcR_eVU Z_FTe`SVc ., ., *

L UVc eYV = : : sd cf]Vd W`c UVeVc^Z Z X `h VcdYZa `W eYV ^VUZR RddVed UVdTcZSVU RS`gV(eYV D fcU`TY =R^Z]j Kcfdesd `h VcdYZa Z_eVcVde Z_ S`eY eYV : `^aR_j R_U =FO h`f]U XV_VcR]]j cVdf]e Z_ VRTY T`^aR_jsd SfdZ_VddVd R_U RddVed SVZ_X ReecZSfeRS]V e` eYV DfcU`TY =R^Z]j Kcfde W`c afca`dVd`W UVeVc^Z_Z_X T`^a]ZR_TV hZeY eYV 9c`RUTRde Fh_VcdYZa I f]Vd R_U eYV Gc`XcR^ 8TTVdd I f]Vd*: `_dVbfV_e]j(eYV: `^aR_j ^Rj SV cVdecZTeVU Wc`^ eR\Z_X RUgR_eRXV`W TVceRZ_RTbfZdZeZ`_ `c Z_gVde^V_e `aa`cef_ZeZVd($Z_T]fUZ_X(W^cViR^a]V(eYVRTbfZdZeZ^-WR_VhdaRaVcZ_eYVdR^V]^TR]^RcVeZ_hYZTY=FO^h_d^c^aVcReVdReV]VgZdZ^$ deReZ`_* @_ RUUZeZ`_(eYV : `^aR_j RXcVVU Z_ eYV JVaRcReZ`_ R_U ; ZdecZSfeZ`_ 8 XcVV^V_e(Rd R^V_UVU(eYRe ZW Ze RTbfZcVd _VhdaRaVcd(cRUZ` `c eV]VgZdZ`_ Sc`RUTRde deReZ`_d `c eV]VgZdZ`_ Sc`RUTRde _Veh`c\d Z_ eYV L*J* R_U dfTY RTbfZdZeZ`_ h`f]U Z^aVUV `c SV cVRd`_RS]j |Z\V]j e` Z^aVUV = FOsd SfdZ_Vdd f_UVc eYV 9c`RUTRde Fh_VcdYZa I f]Vd `c R_j `eYVc \\VUVcR] deRefeV `c =:: cf]V eYRe]Z^Zed(UZcVTe]j `c Z_UZcVTe]j(eYV `h_VcdYZa `c T`_ec`] `W cRUZ` Sc`RUTRde deReZ`_d(eV]VgZdZ`_ Sc`RUTRde deReZ`_d(_VhdaRaVcd R_U+`c eV|VgZdZ`_ Sc`RUTRde _Veh`c\d(Z_T|fUZ_X =FOsd RSZ|Zej e``h_ R_U `aVcReV Zed eV|VgZdZ`_ deReZ`_d `c `eYVchZdV T` ^a]i hZeY dfTY cf]Vd `c deRefeVd(eYV_ eYV : ` ^aR_i hZ]] SV cVbfZcVU e` eR\V TVceRZ_ RTeZ`_d(Z_T]fUZ_X UZgVdeZ_X RddVed(Z `cUVc e` aVc^Ze = FO e` Y`]U Zed ^VUZR Z eVcVded R U e` T`^a]i hZeY dfTY cf]Vd `c deRefeVd* KYV : `^aR i R]d` RXcVVU _`e e` RTbfZcV R_ Z_eVcVde Z_ R ^ f]eZTYR__V] gZUV` ac`XcR^^Z_X UZdecZS fe`c(Z_T]fUZ_X R TRS]V eV]VgZdZ`_ `aVcRe`c(ZW dfTY RTbfZdZeZ` h`f]U dfS[VTe = FO e`eYV Gc`XcR^ 8TTVdd I f]Vd e` hYZTY Ze Zd `e eYV dfS[VTe* KYZd RXcVV^V e VWWVTeZgV] j |Z^Zed eYV RTeZgZeZVd `c decReVXZT SfdZ_Vdd R]eVc_ReZgVd RgRZ]RS]V e` eYV : `^aR_j ZW dfTY RTeZgZeZVd `c decReVXZT SfdZ_Vdd R]eVc_ReZgVd Z^a]ZTReV eYV 9c`RUTRde Fh_VcdYZa If]Vd`c Gc`XcR^ 8TTVdd If]Vd`c R_j `eYVc WVUVcR] deRefeV `c = : cf]V eYRe]Z^Zed(UZcVTe]j `c Z_UZcVTe]j(eYV`h_vcdYZa`cT`_ec`]`W cRUZ`Sc`RUTRde deReZ`_d(eV]VgZdZ`_Sc`RUTRde deReZ`_d(_VhdaRaVcdR_U+`ceV]VgZdZ`_ Sc`RUTRde _Veh`c\d(R_U h`f]U Z^aVUV `c $SV cVRd^RS$] | Z^VUV | $Z^aVUV = FOsd SfdZ_Vdd^*$

>I:B-) JCG: <>HI:G:9 H6A:H D;:FJ>IN H:8 JG>I>:H 6C9 JH:D; EGD8::9H E`V*

>I:B.) 9:;6JAIH JEDC H:C>DG H:8JG>I>:H

E`e Raa]ZTRS]V*

>I:B /) B>C: H6;:IN 9>H8ADHJG:H

E`e Raa]ZTRS]V*

 $>I : B \ 0) DI = :G >C ; DGB 6I > DC$

E`e Raa]ZTRS]V*

>I : B 1) : M = >7 > IH

R& < i YZSZed*

-,-

H>< C6IJG:

 $GfcdfR_e\ e^*\ eYV\ cVb\ fZcV^V_ed^*\ W\ eYV\ JVTfcZeZVd < i\ TYR_XV\ 8\ Te^*\ W\ -5/O(\ eYV\ cVXZdecR_e\ YRd\ Uf]j\ TRfdVU\ eYZd\ cVa^*ce\ e^*\ SV\ dZX_VU\ ^_Zed\ SVYR]W\ Sj\ eYV\ f_UVcdZX_VU\ eYVcVf_e^*\ Uf]j\ RfeY^cZkVU^*$

9 j6 +d+ J fdR_ GR_fTTZ`

J fdR_ GR_fTTZ` : YZVW =Z_R_TZR] FWWZTVc

; ReV6 E`gV^SVc 2(.,.,