;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`_		% <b>- 20</b> &	%-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\		%.&		% <b>- O</b> &
9V_VWZe a]R_ RU[fde^V_ed(_Ve <sup>USA</sup>		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\*

<sup>\*</sup>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	% <b>- O</b> &	p	p	% <b>- O</b> &	% . &	%-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]

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

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

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\*

#### CDI: ,+)>C8DB: I6M:H

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\*

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

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

		6 c _V RUb .+' -+-+	6c_V ?e^U .+' -+-+
		\$Y^ ] Y\\Y	_^c%
K`eR] RddVed6			
; ZXZeR] IVR] <derev jvcgztvd<="" td=""><td>!</td><td>.(//1</td><td>! .(/</td></derev>	!	.(//1	! .(/
JfSdTcZaeZ`_ MZUV` JVcgZTVd		/(1-/	/(015
; `h A`_Vd		.(0/1	.(04,
9``\ GfS]ZdYZ_X		.(.//	.(
EVhd DVUZR		.(,31	-(550
FeYVc*R&		-(051	-(053
$@_gVde^V_ed$		/-0	.53
K`eR] RddVed	!	-0(0,,	! -0(.2-

KYV FeYVc dVX ^ V\_e acZ ^ RcZ]j Z\_T]fUVd : RdY R\_U TRdY Vb fZgR]V\_ed\*

	HU`dU	6 c _V ] RUb .+' -+-+	6c_V ?e^U .+' -+-+
		\$Y^ ] Y	\\Y_^c%
>``UhZ]] R_U Z_eR_XZS]V RddVed( _Ve6			
; ZXZeR] IVR] <derev jvcgztvd<="" td=""><td>!</td><td>-(123</td><td>! -(111</td></derev>	!	-(123	! -(111
J fSdTcZaeZ`_ MZUV` JVcgZTVd		-(1/1	-(1-/
; `h A`_Vd		-(3-5	-(3
9``\ GfS]ZdYZ_X		32,	304
EVhd DVUZR		.41	.33
$\label{eq:K-eR} $K^eR] > \U Z_eR_XZSV \ RddVed(\ Ve$	!	1(422	! 1(4-1

## CDI: ,-) 699>I>DC6A;>C6C8>6A>C;DGB6I>DC

### 7?=?00;<E?L# G?N

I VTVZgRS]Vd RcV acVdV\_eVU \_Ve `W R\_ R]] `h R\_TV W`c U` fSeWf] RTT` f\_ed(h YZTY Zd R\_ VdeZ ^ ReV `W R ^ `f\_ed eYRe ^Rj \_ `e SV T`]]VTeZS]V\* KYV R]] `h R\_TV W`c U` fSeWf] RTT` f\_ed Zd VdeZ ^ ReVU SRdVU `\_ YZde` cZTR] Vi aVcZV\_TV( cVTVZgRS]V RXZ\_X( TfccV\_e R\_U WfefcV VT`\_` ^ZT ecV\_Ud R\_U daVTZWZT ZUV\_eZWZTReZ`\_ `W TVceRZ\_ cVTVZgRS]Vd eYRe RcV Re cZd\ `W \_`e SVZ\_X T`]]VTeVU\*

I VTVZgRS]Vd( \_Ve T`\_dZde `\%6

	6c_V _HU`dU]RUb.+'-+-+	6c_V ?e^U .+' -+-+
	\$T^	] Y\\Y_^c%
I VTVZgRS]Vd	! -(/-1	-(.32
8]]`hR_TV W`c U`fSeWf]RTT`f_ed	%31	å %3/å
I VTVZgRS]Vd( _Ve	! -(.0,	! -(.,/

## CDI: ,.) HJ7H: FJ:CI:K:CIH

1 PEVE

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\$', N 9 SVI MRJSVQEXNSR VIKEVHNRK XLIWI VNWOW ERH YRGIVXEMRXNIW! 'QER] SJ [LNGL 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 JMRERGMEP WXEXIQIRXW SJ : I [ W / SVTSVEXMSR ERH VIPEXIH RSXIW WIX JSVXL IPWI [ LIVI LIVIMR ERH XLI EYHMXIH GSRWSPMHEXIH JMRERGMEP 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` cV\W|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	% <b>- O</b> &	%-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 dXbUU ]_^dXc U^TUT HU`dU ] RUb .+'			
	-+-+	-+,4	8 X Q ^ W U	'' 8XQ^WU
%Z_ ^Z]]Z`_d( ViTVae " &			7 UddUl	*\$ L _bcU%
IVgV_fVd6				
: `_df ^ Vc	! 00-	! /43	! 10	-0 "
FeYVc	-3	-4	% - &	%2& "
I_dQ\ GUfU^eUc	/03	/+0	0.	,. "
FaVcReZ_X ViaV_dVd	%/,0	k %.358	%.1&	%5& ''
JV]]Z_X( XV_VcR] R_U RU^Z_ZdecReZgV	%4/	k %338	%2&	%4& ''
HUW] U^d:7>196	! 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\*

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

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

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