





KRSIV `W : `eV\_ed



# JYRcVY`]UVc =VV <iR ^a]V

=f\_U dYRcVY`]UVcd ^Rj z\_Tfc eh` ejaVd `W T`ded5 \$,% ecR\_dRTeZ`\_ T`ded' z\_T]fUZ\_X dR]Vd TYRcXVd  
\$]`RUd%`\_afcTYRdV aRj^V\_ed R\_U cVUV^aeZ`\_\*ViTYR\_XV WVVd6 R\_U \$-%`\_X`z\_X T`ded' z\_T]fUZ\_X  
^R\_RXV^V\_e WVVd6 UZdecZSfeZ`\_R\_U dVcgzTV \$,-S(,% WVVd6 R\_U`eYVc Wf\_U ViaV\_dVd) KYZd ViR^a]V Zd  
z\_eV\_UVU e`YV]a j`f f\_UVcdeR\_U j`fc`\_X`z\_X T`ded \$z\_U`]]Rcd%`W z\_gVdeZ\_X z\_j`fc Wf\_U R\_U e`  
T`^aRcV eYVdV T`ded hZeY eYV`\_X`z\_X T`de`W z\_gVdeZ\_X z`eYVc ^fefR] Wf\_Ud)

KYV ViR^a]V Zd SRdVU`\_R\_z\_gVde^V\_e`W ,'+++ ^RUV Re eYV SVXz`\_z\_X`W eYV aVcz`U R\_U YV]U W`c  
eYV V\_eZcV aVcz`U Wc`^ AR\_fRcj ,'-+-. e` Af\_V .+' -+-.)

5P`aNx 9d\RZ\_R\_

KYV eRS]V ac`gzUVd z\_W`c^ReZ`\_RS`fe RTefR] RTT`f\_e gR]fVd R\_U RTefR] ViaV\_dVd W`c VRTY T]Rdd)  
P`f ^Rj fdV eYV z\_W`c^ReZ`\_e`XVeYVc hZeY eYV R^`f\_e j`f z\_gVdeVU' e`VdeZ^ReV eYV ViaV\_dVd eYRe  
j`f aRzU`gVc eYV aVcz`U) =Zcde`zUV\_eZ]j eYV dYRcV T]Rdd j`f`h\_) KYV\_dz^a]j UZgzUV j`fc RTT`f\_e  
gR]fV Sj ,'+++ \$W`c ViR^a]V' R\_ 3'1++ RTT`f\_e gR]fV UZgzUVU Sj ,'+++ 7 3)1% eYV\_ ^f]eZajj eYV  
cVdf]e Sj eYV\_f^SVc f\_UVc eYV YVRUZ\_X q<iaV\_dVd GRzU ; fcZ\_X GVcz`Ur e`VdeZ^ReV eYV ViaV\_dVd  
j`f aRzU`\_j`fc RTT`f\_e UfcZ\_X eYzId aVcz`U)

<e\ [UR`VPI VZT DR`W

# JTYVUfjV `W @\_gVde^V\_ed

>|B9 -\*& ,\* , - #|B5|8=H98\$

	GUN^R_	JN aR
7CAACB GHC7?G i 31(-		
5R^[_\NPR NZQ 8RSRZ_R i +(3		
>V_VcR] ; j_R^Ttd : `ca)	, +321	-'. .4'42,
?f_eZ_Xe`_@_XR]d @_UfdecZVd' @_T)	/0'-24	, +'. +0'0+, ,-'1'0'/2-
5a`[Y [O WR 7 [Y \ [ZRZ`_ i ,(+		
8aeZg GC : <sup>s,8</sup>	--'1/0/	-'-4-' .-4
9`cXNRc_Vc' @_T)	, / -'1/32	1'414'+.4
:IV >V_VcR]V UVd <eRS]ddV^V_ed D TYV]_ J : 8	, 04'1- /	/'- , '34+ ,. '43.'-03
6NZW_ i .(*		
:RaZe`) =VUVcR] =Z_R_TZR]' @_T)	, +, '434	, '31.'-2-
: `^VcZTR' @_T)	2'110	. - /'134
=Zcde ?RhRZR'_ @_T)	.1, '323	1'0, 2' / - .
Gc`daVcZj 9R_TdYRcVd' @_T)	11'2/0	. '214'203
KcfZde =Z_R_TZR] : `ca)	- /1'.2+	2' /22'. -4
L)J) 9R_T`ca	, . -', /,	/'.10'4.4
NVdeR^VcZTR 9R_ : `ca	0+'1/4-	, '4. '3// -1'-0'-0/
6a Q ZT D^ [QaP`_ i +(-		
:IV UV JRL_e(> `SRZ_	, .3'104	3'//-'//-
7N V`N  AN^WR`_ i 0(1		
9R_ \ `W EVh P`c\ DV]`_ : `ca)	. --'01-	, /'.1+' /1+
:YRc]Vd JTYhRS : `ca)	4/ '0+2	0'.01'102
E`ceYVc_Kcfde : `ca)	-+2'-31	, 0'.13', 3/
K) I `hV GcZTV >c`fa' @_T)	31'2+.	4'2, -' /2+ // '242'22,
7URY PNX_ i +(2		
8\k` E`SV] EM	, , /'1, 3	4'.2+' .3/
8iR]eR : `ReZ_X JjdeV^d CeU) <sup>s,8</sup>	2/ '1/3/	- /' /'. '3-+ ,, '3, /'-+ /
7 [Y YR^P NX GR^b PR_NZQ Ga \ \WR_ i *(/		
I VafS]T JVcgZTVd' @_T)	- , '- /2	. '-0' /' /+.
7 [Y YaZ PN^V [Z_9] aV \ YRZ` i +(3		
=0' @_T) <sup>s,8</sup>	0-' +3/	2'1, 2'3+1
Af_ZaVc EVeh `c\ d' @_T)	, 13'3/ ,	0'-34'233 ,-'4+2'04/
7 [Z `^aP^V [Z NZQ 9ZTVZRR^VZT i +(+		
MZ_TZ J8	1/ '2, ,	2'0, 4', --
7 [Z_aYR^G`N \ \WR_8V_`^Oa^V [Z ! FR`N X i -(1		
; `]]Rc KcVv' @_T) <sup>s,8</sup>	21' /0+	, + '42+'020
B`_Z_ \ ] [V 8Y`]U ; V]YRZkV EM	.4+'3, 0	, .'. - /' +1, - /'-4' /'1.1
7 [Z `N ZR^_ NZQ DNPWNT ZT i -(.		
8^T `c GC :	3+ .'. 0+	3'+, 2' / . .
GRT VRX_X : `ca) `W 8^VcZTR	30'20,	, ,'. . -'30-
J`_T` Gc`UfTed : `)	0, '1, +	, '+ /1'+-- --'.41'.+2

8\br^\_VSI RQ F9=H\_ i \*(/
NG : RcVj' @\_T) 0.'/0. .'1, '-30
8\br^\_VSI RQ HR\RP [ Y YaZ\PN^V [Z GR^b\PR\_ i \*(,
9 : <' @\_T) .1'0// , '111', 14
9\RP^\_VP I^W^VR\_ i 0\*(
; f\V <\_VcXj : `ca) 42'331 3'23/'-4+
<UId`\_@\_eVc\_ReZ`\_R] -, -'.14 , /'2/4'+-2
<gVcXj' @\_T) 43'.3, 0'2/2'/, 3
<gVcd` fcTV <\_VcXj 13'23- /'323'+-+
Gz\_RT]V NVde : RaZbR] : `ca) 12'3-2 0'0-0', 32
.4'13.'4/-
9\RP^\_VP Nk 9] a\ \ YRZ` i -(-
<^Vcd`\_<]VTecZT : `) , /, '.11 , -'223'+2.
CVXcR\_U J8 -2'.+- -'2+3'/1/
\_MV\_e <]VTecZT GC : , .+ '03, 1'2/2', -+
--'-...102
9\RP^\_ [Z\IP 9] a\ \ YRZ`&=Z\_`a YRZ`\_ NZQ 7 [ Y \ [ZRZ`\_ i +(/
: `c\_l\_X' @\_T) 33'+-2 .' +3'/11
K< : `\_\_VTeZgZej CeU) 0+'./. 2'+01'+20
, +', /+ '0/ ,
9ZR^Te 9] a\ \ YRZ` NZQ GR^b\PR\_ i +(
9R\Vc ? fXYVd : `) -, , '03- 2'. -+'.+2
9Z`R^\_N\Z YRZ` i \*(0
<]VTec`\_T 8ced` @\_T) -4'0.1 .'3. + '3, 4
: [ [ Q D^ [ QaP`\_ i , (3
: `\_RXcR 9cR\_Ud' @\_T) /- /'41, , /'. -4'130
A D J ^ fT\Vc : `) .-', 33 /'20.'-+-
, 4'+3-'332
; N\_ I^W^VR\_ i ,(,
8e^`d <\_VcXj : `ca) , , '.1/ .'1/3'333
JaZcV' @\_T) , 21'103 , , '-+2', 3.
, /'301'+2,
; ^ [ aZQ H^NZ\_ \ [ Y A ^ V 6^NZQ\_&=ZP( - 0& \*1
8 [ `G\
7 \ < G\ V^R&=ZP( 0 0 0 0 0 A
7 ] `\_ 0 ] b\ G\ V^R&=ZP(
7 \ 7 [ ^ \ ( 0 0 0 A

<RNX'U 7N^R F9=H\_ i +(),



	GUN^R_	JN^aR
HRPUZ [X[Te <N^QcN^R& G`[^NTR NZQ DR^V\UR^N^ i +(* ?G' @_T)	-, '1+,	1'/43'-12
H^N^Q^Z^T 7 [Y\NZ^R_NZQ 8\^Oa`[^_ i ,(2 9VRT`_ I`^X J faa]j` @_T)^,^	1+' .4-	0'+, ,'.-3
9f_k] GC:	32', 40	.'.--'3.,
DJ: @_UfdeczR] ; zcVTe : `)_@_T)' :]Rdd 8	, +/'0, 0	4'403', 34 , 3'-4-'./3
HCH5@ 7CAACB GHC7?G \$: `de 031'400'4+2%		0./k*2+k, /2
9L7<5B; 9'HF5898 : IB8G i +(- ]JYRcVd I fddV]] DJU(: Ra MR]fV <K= \$: `de 2'3/' .33%	24'.3/	3'2, 4'0.3
G<CFH'H9FA =BJ9GHA9BHG i +(0 A [ZRe AN^WR` : aZQ_`^m		
JeReV JecVVe @ deefeZ`_R] L)J) > `gVc`^V_e D`_Vj DRc\Ve =f`U' GcV^Zvc :]Rdd	, 2'.//	, 2'.//
FR\ a^PUN_R 5T^RRYZ`_ i +(0 9DF : RaZeR] DRc\Ved : `ca)' \$T`]]ReVcR]kVU Sj gRcZ` fd L)J) KcVRdfcj `S]XReZ`_d`/)-0! (/)0+!'0*, 0*.3 ( , , *, 0*/+` gR]fVU Re , '120'0.3%`_R [ `Z` e ecRUZ`_X RTT` f_e Re 0)+-!' UReVU 1*.+*-.' Ufv 2*. *- . \$; V]gVcj gR]fV , '1..'-0.%		, '1. -'02+
=iVU @_T`^V :]VRcZ`_X : `ca)' \$T`]]ReVcR]kVU Sj gRcZ` fd L)J) KcVRdfcj `S]XReZ`_d`/), -0!' , , *, 0*.-' gR]fVU Re 4'+-4', , /%` Re 0)/+!' UReVU 1*.+*-.' Ufv 2*. *- . \$; V]gVcj gR]fV 3'300'2, 3%		3'30-'+++ , +'/3/'02+
HCH5@ G<CFH'H9FA =BJ9GHA9BHG \$: `de , +0+, '4, /%		+*/+*+3+.
HCH5@ =BJ9GHA9BH G97 I F=H:9G i +**( \$: `de 1+0'-43'-+4%		00. k.-*, k1+*
CH<9F 5GG9HG 5B8 @=56=@=H:9G i #*(,\$		#+k+1+k2*3\$
HCH5@ B9H 5GG9HG i +**(*		00-k+-*k3*+

:CFK5F8 :CF9=: B 7 I FF9B7M 9L7<5B; 9 7CBHF57HG

7a^RZPe Da^PUN_RQ	7a^RZPe G[XQ	7 [aZ`R^N^e	GR`YRZR` 8N`R	I Z^RNWfRQ 5 \ \ ^RPIN`V [Z #8R \ ^RPIN`V [Z\$
LJ; , 0-'34+ : 8;	-+-'-11 > `]U^R_ JRTYd " : `)		4*-4*-.	/
LJ; --, '23+ : 8;	-4/'+/+ > `]U^R_ JRTYd " : `)		4*-4*-.	\$/23%
LJ; 10.', +, : 8;	31/' +0. > `]U^R_ JRTYd " : `)		4*-4*-.	\$3%
LJ; , , '/20'+42 < L I	, +/'03'2/3 9R_ \ ` 8 ^VcZTR E)8)		4*-4*-.	, '1/2
LJ; --'-00'2, 2 < L I	-+'.+.'./2 AGD`cXR` : YRdV 9R_ \ E)8)		4*-4*-.	0'3/0
LJ; , , '/20'4/0 < L I	, +/'03'2/2 D`cXR`_ J@R_ ]Vj		4*-4*-.	, /' /4/
LJ; 0', 22'430 > 9G	/'+2/'4, - 9R_ \ ` 8 ^VcZTR E)8)		4*-4*-.	, '31.
LJ; , 1-' /4 > 9G	, -3' /	ø		
LJ 8 D 10.', +, 7	, -3' /		∅ J ∅ VcZTR E)8)	4*-4*-

BCH9G HC G7<98 I@9 C: -BJ9GHA9BHG

8; I o 8^Vc:TR\_ ;Va`dizRcj I VTVzae

:8; o :R\_RUzR\_ ;`]]Rc

:R

# JeReV^V\_e`W 8ddVed R\_U C[RSZ]ZeVd

>|B9 -\*&,\*, - #|B5|8:H98\$

## 5\_\_R`\_

@_gVde^V_e dVTfcZeVd' Re gR]fV \$T`de `W 1+0' -43' -+4%	11/' .+-'2,+
=`cVZX_TfccV_Tj Y`]Uz_Xd' Re gR]fV \$T`de `W 010'.23%	01/'2.3
I VTV]gRS]V `c`z_gVde^V_ed d`]U	/' .2'013
I VTV]gRS]V `c`TRaZeR] dYRcVd d`]U	-30'0-.
L_cVR]kVU RaacVTzRez`_`_`chRcU `cVZX_TfccV_Tj ViTYR_XV T`_ecRTed	.1'++-
;zdeczSfez`_`WVd aR]RS]V	,'.+4'.01
	<hr/>
	12+'3.0'342
	<hr/>

## @|NOwV`R\_

GRjRS]V `c`z_gVde^V_ed a fCTYRdVU	0'4+-' ./1
GRjRS]V `c`TRaZeR] dYRcVd cVUVV^VU	, '-3.'00+
L_cVR]kVU UVacVTzRez`_`_`chRcU `cVZX_TfccV_Tj ViTYR_XV T`_ecRTed	/' , ,3
8TTcfVU ^R_RXV^V_e ]VVd	/ ,1'03-
;zdeczSfez`_`WVd aR]RS]V	43' /++
	<hr/>
	2'2+/'441
	<hr/>

## BR`5\_\_R`\_

11.' , .+4+ ,

---

---

## BR`5\_\_R`\_7[Z\_V`\_\$4

: RaZeR] \$aRc gR]fV R_U aRzU(z_dfca]fd%	1+ , '340'2. /
;zdeczSfeRS]V VRc_z_Xd \$]`dd%	1, '- .0' ,12
	<hr/>
	11.' , .+4+ ,
	<hr/>

# JeReV^V\_e`W FaVcReZ`\_d

:CF H<9 G=L ACBH<G 9B898 >| B9 -\*& ,\* , - #| B5 | 8-H98\$

=ZbR\_`YRZ`-ZP[YR#@[\_\_\$

=ZP[YR4

;zgUV\_Ud \$ \_Ve `|||`cVIX\_eRiVd hZeYVJU `|| -+1', 3, %

3'4/-'+, -

@\_eVcVde

.++'1,2

JVTfcZeVd ]V\_Uz\_X' \_Ve

2'004

4'-0+',33

9d\|RZ\_R\_4

DR\_RXV^V\_e ||VVd

-'04-'3+0

;ZdecISfeZ`\_||VVd ( :]Rdd @@

1,2'/+|

<iaV\_dVd5



# E`eVd e` =l\_R\_TZR] JeReV^V\_ed

>I B9 -\*&, \*, - #I B5 I 8-H98\$

+(C^TNZVfN^V[Z

8^VcTR : V\_e f c j MRcRSJG`cell`l`d`\_T) \$eYV T`ca`cReZ`\_% Zd cVXZdeVcVU f\_UVc eYV @\_gVde^V\_e : `^aR\_j 8Te  
`W ,4/+` Rd R^V\_UVU \$eYV ,4/+ 8TeM` Rd R`\_av\_(V\_U ^R\_RXV^V\_e l\_gVde^V\_e T` ^aR\_j R\_U Id `cXR\_ikVU Rd R  
DRcJjR\_U T`ca`cReZ`) MG DZU : Ra MR]fV =f\_U \$eYV Wf\_U% Zd `V Wf\_U l\_R dVcZVd ZddfVU Sj eYV T`ca`cReZ`)  
KYV Wf\_Usd l\_gVde^V\_e `SjVTeGv Zd e` dVW\ ]\_X(eVc^ TRaZeR] Xc` heY) @\_T` ^V Id R dVt`\_URc j `SjVTeGv) KYV Wf\_U  
`WVcd : ]Rdd @\_R\_U : ]Rdd @

, (GVTZSjIPNZ` 5PP [aZ`VTZ D[XjPIR\_

KYV W]` hZ\_X Id R df ^aRc] `dZ\_X ZCTR\_e RTT` f\_eZ\_X a`jTZVd T`\_dZdeV\_ej W]` hVU Sj eYV Wf\_U l\_acVaRcReZ`  
`W Zd R\_U TZR] deReV^V\_ed) KYV Wf\_U Id R l\_gVde^V\_e T` ^aR\_j R\_U W]` ]`hd RTT` f\_eZ\_X R\_U cVa`ceZ`\_X X fzUR\_TV  
l\_RTT`\_cUR\_TV hZeY RTT` f\_eZ\_X acZ`Tza]Vd XV\_VcR]j] RTTvaeVU l\_eYV L`ZeVU JeReVd `W 8^VcTR) KYZd `Rj cVbfZcV  
^R\_RXV^V\_e` ^RlV TVcReZ`\_VdeZ`^ReVd R\_U Rddf^aeZ`\_d Re eYV UReV `W eYV W\_R\_TZR] deReV^V\_ed) 8TeFjR] cVdfjed  
T` fJU UZjVc Wc` ^eYVdV VdeZ`^ReVd) DR\_RXV^V\_e VgR]fReVU eYV l`aRTe `W VgV\_ed `c eCR\_dRTeZ`\_d` TTfccZ\_X  
eYc` fXY eYV UReV eYV W\_R\_TZR] deReV^V\_ed hVcV ZddfVU eYRe h` fJU ^VcZe cVT`\_X`ZeZ`\_` c UdT]` dfcV)

=ZbR`\_YRZ` JNkaN^V[Z`\_ i gKYV Wf\_U UVeVc^Z\_Vd eYV WRC` gR]fV `W Zd l\_gVde^V\_ed R\_U T` ^afeVd Zd `Ve RddVe  
gR]fV \$E8M` aVc dYRcV Re eYV T]` dV` W cVXf]Rc ecRUZ`\_X \$f d f R]j] / a) ^) <RdVc`\_eZ`^V%`\_` eYV EVh P`c\ Je` T\  
<iTYR\_XV \$EPJ<`%`\_` VRTY URj eYV EPJ<` Id `av\_) KYV gR]fV `W l\_gVde^V\_ed `W eYV Wf\_U Id UVeVc^Z\_VU Sj  
8^VcTR : V\_e f c j @\_gVde^V\_e DR\_RXV^V\_e` @\_T) \$8 : @D` \$eYV l\_gVde^V\_e RUGid` cM` Rd eYV gR]fReZ`\_ UVdZX\_VV`  
afcd fR\_e e` ZeZ` gR]fReZ`\_ a` jTZVd R\_U ac` TVUfcVd) KYV 9` RcU `W ;ZcVTe` cd `gVcdVdVd eYV gR]fReZ`\_ UVdZX\_VV\_R\_U  
cVgZVhd ZeZ` gR]fReZ`\_ a` jTZVd R\_U ac` TVUfcVd Re ]VRde R`\_ fR]j]

<b fZe j dVT fZeZVd eYRe Rcv ]ZdeVU `c eCRUVU ` \_R\_U` ^VdeZT dVT fZeZVd ViTYR\_XV Rcv gR]fVU Re eYV ]Rde cVa`ceVU  
dR]Vd acZTV `c Re eYV `W W\_TZR] T]` dZ\_X acZTV Rd ac` gZUVU Sj eYV ViTYR\_XV) <b fZe j dVT fZeZVd eCRUVU ` \_W` cVZX`  
dVT fZeZVd ViTYR\_XVd Rcv XV\_VcR]j] gR]fVU Re eYV T]` dZ\_X acZTV `W d fTY dVT fZeZVd ` \_eYV ViTYR\_XV hYVcV  
acZ`^RcZj] eCRUVU `c Re eYV T]` dV` W eYV EPJ<` Zl eYV Re Zd VRc]ZVc) @]`\_ ]Rde dR]Vd acZTV Id cVa`ceVU` `c Zl ]` TR]  
T`\_gV\_eZ`\_` `c cVXf]ReZ`\_d` ac` gZUVd` eYV ^VR`\_ `W eYV ]ReVde SIZU\_R\_U Rd ]VU acZTVd `Rj SV fdVU) JVT fZeZVd  
eCRUVU `gVc(eYV(T`\_f\_eVc Rcv gR]fVU Re eYV ^VR`\_ `W eYV ]ReVde SIZU\_R\_U Rd ]VU acZTVd` eYV ]Rde dR]Vd acZTV` `c eYV  
`W W\_TZR] T]` dZ\_X acZTV) <b fZe j dVT fZeZVd l\_ZeZ]j] Vi acVddVU l`\_ ]` TR] TfccV`\_TVd Rcv eCR\_d]ReVU l`\_e` Lj) U` ]]Rcd Re  
eYV ^VR`\_ `W eYV Raac` acZReV TfccV`\_Tj ViTYR\_XV cReV Re eYV T]` dV` W eYV EPJ<` Rd ac` gZUVU Sj R`\_ l\_UVaV\_UV\_e  
acZTl`\_X dVcgZTV)

FaV\_(V\_U ^R\_RXV^V\_e l\_gVde^V\_e T` ^aR\_ZVd Rcv gR]fVU Re eYV cVa`ceVU E8M aVc dYRcV) I Va f c TYRdV  
RxcVv^V\_ed Rcv gR]fVU Re T` de` hYTYT Raac`\_iZ`^ReVd WRC` gR]fV) =`chRcU W` cVZX`\_TfccV`\_Tj ViTYR\_XV T`\_ecRTed  
Rcv gR]fVU Re eYV ^VR`\_ `W eYV Raac` acZReV W` chRcU ViTYR\_XV cReV Re eYV T]` dV` W eYV EPJ<` Rd ac` gZUVU Sj R`\_  
l\_UVaV\_UV\_e acZTl`\_X dVcgZTV)

@] eYV gR]fReZ`\_ UVdZX\_VV UVeVc^Z\_Vd eYRe eYV ^RcVVe acZTV W` `c R a` cell` ]l` dVT fZeZ` Id ` \_e cVRU]j RgR]RSJ] `c Zd  
SjV]VgVU Sj eYV gR]fReZ`\_ UVdZX\_VV e` SV f\_cV]RSJ]` d fTY dVT fZeZ` Id gR]fVU Re WRC` gR]fV Rd UVeVc^Z\_VU l`\_X` `U  
WRC`eY Sj eYV gR]fReZ`\_ UVdZX\_VV` l`\_ RTT`\_cUR\_TV hZeY ZeZ` a` jTZVd R\_U ac` TVUfcVd) :ZcT`^cdeR`\_TVd eYRe ^Rj TRfdV  
eYV Wf\_U e` UVeVc^Z\_V eYRe ^RcVVe bf`eReZ`\_d Rcv ` \_e RgR]RSJ] `c cV]RSJ] l`\_Tj fUV` Sfe Rcv ` \_e ]Z`ZeVU e` 5 hYV`  
eYVcV Id R dZ\_X ZCTR\_e VgV\_e dfSdVbfV\_e e` eYV ^RcVVe bf`eReZ`\_6 eCRUZ`\_X l`\_R dVT fZeZ` YRd SWV`\_YR]eVU UfcZ`\_X  
eYV eCRUZ`\_X URj 6` eCRUZ`\_X l`\_R dVT fZeZ` Id l`\_df WZTV\_e `c UZU ` \_e eRlV ajRtV UfV e` R T]` d f c V` c Y` ]URj]

KYV gR]fReZ`\_ UVdZX\_VV ` \_e` Ze` cd W` c dZ\_X ZCTR\_e VgV\_ed ` TTfccZ`\_X RleVc eYV T]` dV` W R`\_ l\_gVde^V\_ed acZ`^Rc j  
ViTYR\_XV Sfe SV W` cV eYV Wf\_Usd E8M aVc dYRcV Id UVeVc^Z\_VU) JZ\_X ZCTR\_e VgV\_ed `Rj l`\_Tj fUV` Sfe Rcv ` \_e  
]Z`ZeVU e` 5 T`ca`cReV R`\_` f\_TV^V\_ed R\_U eCR\_dRTeZ`\_d6 cVXf]Re`\_c j `Vhd` X`gVc`^V\_eR] RTeZ`\_` R\_U a` jZeZTR]  
f\_cVde eYRe T` fJU l`^aRTe R daVTZlT l`\_gVde^V\_e` c R`\_ l\_gVde^V\_e dVTe`c6 `c R c`^VU T`\_ ]]ZTed`\_Re f c R] UzdRdeVcd  
R\_U dZ`^Rc VgV\_ed eYRe T` fJU R W VTe l`\_gVde^V\_ed l`\_R daVTZlT T`\_f\_eZ`\_` cVXZ`\_ ) KYV gR]fReZ`\_ UVdZX\_VV Rj d`  
^`\_Ze` cd W` c dZ\_X ZCTR\_e W] fTe fReZ`\_d SVehVV`\_U` ^VdeZT R\_U W` cVZX`\_^RcV`Ved` Rd VgZUV`\_TVU Sj eYV Lj) ^RcVVe  
`c d fTY` eYVc l`\_UZTRe` cd eYRe Ze UVV`^d Raac` acZReV) KYV gR]fReZ`\_ UVdZX\_VV `Rj Raaj] R`^ UV] (UVcZgV WRTe` c e`  
eYV T]` dZ\_X acZTV `W Vb fZe j dVT fZeZVd eCRUVU ` \_W` cVZX`\_dVT fZeZVd ViTYR\_XVd) KYV WRTe` c Zd SRdVU ` \_  
`SdVogRSjV` ^RcVVe URcR Rd ac` gZUVU Sj R`\_ l\_UVaV\_UV\_e acZTl`\_X dVcgZTV)

GRPa^e H^NZ\_NP^V[Z\_ i JVTfcZej ecR\_dRTel`\_d RcV RTT` f\_eVU`c Rd` `eYV ecRUV UReV) EVe cVR]zkVU XRZ\_d R\_U ]`ddVd RcV UVeVc^Z\_VU`\_eYV ZUV\_eZUVU T`de SRdzd' hYZTY Zd R]d` fdVU`c`WUVcR]Z\_T`^V eRi afca`dVd)

=ZbR`YRZ`=ZP[YR i ; ZgzUV\_U Z\_T`^V]Vdd`cVZX\_eRiVd hZeyYV]U' ZR\_j' Zd cVT`cUVU Rd`eYV Vi(UZgzUV\_U UReV) ; ZdecSfel`\_d cVTV]gVU`\_dVTfcZelVd eYRe cVacVdV\_e R cVefc` `TRaZer] `c]`\_X(eVc^ TRaZer] XRZ` RcV cVT`cUVU Rd R cVUfTel`\_ `T`de` `gVde^V\_ed R\_U`c Rd R cVR]zkVU XRZ\_) KYV`f\_U ^Rj Vdel^ReV eYV T`^a`\_V\_ed` `UZdecSfel`\_d cVTV]gVU eYRe ^Rj SV T`\_dZUVcVU`\_eRiRS]V UZdecSfel`\_d`c]`\_X(eVc^ TRaZer] XRZ` UZdecSfel`\_d`c`Z\_T`^V eRi afca`dVd) @\_eVcVde Z\_T`^V Zd cVT`cUVU`\_eYV RTTcfr] SRdzd R\_U Z\_T]fUVd RTTcVeZ`\_ `UZdT`f\_ed R\_U R^`ceZkReZ`\_ `acV^Zf^d) JVTfcZelVd ]V\_UZ\_X Z @\_A c

GRPa<sup>W</sup>VR\_@RZQVZT i JVTfcZeZVd RcV Jv\_e e` bfrj]WZVU W\_R\_TzRj Z\_dZeFeZ`\_d R\_U Sc` \Vcd) JeReV JecVVe 9R\_ \ " Kcdf :`) dVcgVd Rd dVtfcZeZVd Jv\_Uz\_X RXV\_e e` eYV Wf\_U afcdfR\_e e` R JVTfcZeZVd CV\_Uz\_X 8XcVV^V\_e) KYV Jv\_Uz\_X `W dVtfcZeZVd Via` dVd eYV Wf\_U e` cZdVd dfTY Rd5 eYV S`cc` hVcd ^Rj WZj] e` cVefc\_eYV ]`R\_VU dVtfcZeZVd` eYV S`cc` hVcd ^Rj `e SV RSjV e` ac`gUUV RUUZeZ`\_Rj T`]]ReVcRj` eYV Wf\_U ^Rj ViaVcZV\_TV UVjRj d`\_cVt`gVcj `W eYV ]`R\_VU dVtfcZeZVd` c UVjRj d`\_RTTvdd e` T`]]ReVcRj` `c eYV Wf\_U ^Rj ViaVcZV\_TV ]`ddVd cVjReVU e` eYV ]\_gVde^V\_e T`]]ReVcRj) K` ^Z`Z^ZkV TVceRz`\_cZd\`d` ]`R\_T` f\_eVcaRceZVd aJUVXV T`]]ReVcRj]\_eYV W`c^ `W TRdY R\_U` `c dVtfcZeZVd) KYV Jv\_Uz\_X RXV\_e Yrd RXcVVU e` Z\_UV^\_Zj] eYV Wf\_U Z` eYV TRdV `W UVIRfj]e `W R\_j dVtfcZeZVd S`cc` hVU) :RdY T`]]ReVcRj] cVTVgVU Id Z\_gVdeVU ]\_eYV JeReV JecVVe ERGzXRe`c JVTfcZeZVd CV\_Uz\_X >`gVc^\_V\_e D`\_Vj DRcVVe G`ceH` ]`R`^`\_Vj ^ReVVe ^fefRj] Wf\_U cVXZdeVcVU f\_UVc eYV ,4/+ 8Te) KYV ]`R\_d ^Rj Rj d`\_SV dVtfcVU Sj\_L) X`gVc^\_V\_e dVtfcZeZVd ]\_R`\_R`^`\_f\_e Re ]VRde Vbfrj] e` eYV ^RcVVe grjfv `W eYV dVtfcZeZVd ]`R\_VU` aJfd RTTcfVU Z\_eVcVde R` U UgZUV`\_Ud` UVeVc^Z\_VU `R URZj] SRdZd R\_U RUjfdV RTT`cUZ\_Xj] 9j Jv\_Uz\_X dVtfcZeZVd` eYV Wf\_U dVvId e` Z`TcVRdV Zed`\_Ve Z\_gVde^V\_e Z`\_T`^V\_eYc` fXY eYV cVTVZae `W Z\_eVcVde R\_U WVd) J fTY Z`\_T`^V Id cV]VTeU dVaRcReVj] hZeY Z`\_eYV JeReV^V\_e `W FaVcReZ`\_d) KYV grjfv `W ]`R\_VU dVtfcZeZVd R\_U cVjReVU T`]]ReVcRj` fedeR\_Uz\_X Re aVcZ`\_U V\_U`\_Z] R\_j` Rcv dY`h`\_`\_R Xc`dd SRdZd hZeY Z`\_eYV JTYVU fVj `W @\_gVde^V\_ed R\_U JeReV^V\_e `W 8ddVed R\_U CIRSj]ZeZVd)

-( :RR\_NZQ H^Nz\_NP`V[Z`\_cV`U FRIN`RQ DN^`VR\_

:VceRz`\_WZTVcd R\_U UzCvTe`cd `W eYV T`ca`cReZ`\_RcV Rj d`\_WZTVcd R\_U`c UzCvTe`cd `W 8^VcZTR`\_ :V\_efcj :`^aR\_Zvd`\_T) \$8 : :\*) KYV T`ca`cReZ`\_d Z\_gVde^V\_e RUgZid`c` 8 : @D` eYV T`ca`cReZ`\_d UidecSfe`c` 8^VcZTR`\_ :V\_efcj aJ\_gVde^V\_e JVcgTVd`\_T) \$8 : @J` R\_U eYV T`ca`cReZ`\_d ecR\_dIVc RXV\_e` 8^VcZTR`\_ :V\_efcj JVcgTVd` CC :` Rcv hY`]]j `h\_VU` UzCvTej]`c` Z\_UzCvTej]` S`j 8 : :)

ANZNTYRZ` :RR\_ i KYV T`ca`cReZ`\_Yrd V\_eVcVU Z`\_e` R ^R\_R XV^V\_e RXcVV^V\_e hZeY 8 : @D` f\_UVc hYTY 8 : @D` ac`gUUVd eYV Wf\_U hZeY Z`\_gVde^V\_e RUgZid`c`j R\_U ^R\_R XV^V\_e dVcgZTVd Z`\_ViTYR\_XV W`c` R dZ`\_Xj]` f`\_Z]VU ^R\_R XV^V\_e ]VV \$eYV ]VV` aVc TJRdd) KYV RXcVV^V\_e ac`gUUVd eYRe 8 : @D` hZj] aRj Rj] ViaV\_dVd `W ^R\_R XZ`\_X R\_U `aVcReZ`\_X eYV Wf\_U` ViTVae Sc` \VcRXV ViaV\_dVd` eRiVd` Z\_eVcVde` ]VVd R\_U ViaV\_dVd `W eYV Z`\_UvAV\_UV\_e UzCvTe`cd \$Z`\_Tj fUz\_X ]XRX] T`\_f\_dV] ]VVd W` ViecR`\_cUz`\_Rcj ViaV\_dVd` R\_U ViaV\_dVd Z`\_T`\_fCccVU Z`\_T`\_VTeZ`\_` hZeY eYV ac`gZid` `W dYRcVY` ]UVc dVcgZTVd R\_U UidecSfeZ`\_` dVcgZTVd f\_UVc R aJ`\_RU` aeVU afcdfR\_e e` I fJv , -S(, f\_UVc eYV , 4/+ 8Te) KYV ]VV Id T`^afeVU R\_U RTTcfVU URZj] SRdVU ` \_VRTY TJRddid URZj] `Ve RddVed R\_U aRZU `^`\_eYj] Z`\_RccVRcd) KYV UZ]WcV\_TV Z`\_eYV ]VV R`^`\_X eYV TJRddVd Id R cVdfj]e `W eYVc dVaRcReV RccR\_XV^V\_ed W`c`\_`\_ (I fJv , -S(, dYRcVY` ]UVc dVcgZTVd) @e Z`\_d `eYV cVdfj]e `W R\_j UZ]WcV\_TV Z`\_RUgZid`c`j `T`\_fCde` URZj] ]VVd `c` eYVc ViaV\_dVd cVjReVU e` eYV ^R\_R XV^V\_e `W eYV Wf\_U`\_Usd RddVed` hYTY U`\_`\_e gRcj S`j TJRdd)

KYV R\_\_fR] ^R\_R XV^V\_e ]VV W`c` VRTY TJRdd Id Rd W`]]`\_hd5

7XN =	7XN ==
+30!	+20!

8V`^oAaV[Z :RR\_ i KYV 9`RcU` W ;ZcVTe`cd YRd RU` aeVU eYV DRdeVc ;ZdecSfeZ`\_` GjR` \$eYV aJ`R` W`c` : ]Rdd @` aJfdR\_e e` I fJv , -S(, `W eYV , 4/+ 8Te) KYV aJ`R` ac`gUUVd eYRe : ]Rdd @` hZj] aRj 8 : @J` R`\_fR] UidecSfeZ`\_` ]VV Vbfrj] e` +)-O!) KYV ]VV Id T`^afeVU R\_U RTTcfVU URZj] SRdVU ` \_eYV : ]Rdd @` URZj] `Ve RddVed R\_U aRZU `^`\_eYj] Z`\_RccVRcd) KYV UidecSfeZ`\_` ]VV ac`gUUVd T`^av\_dReZ`\_` W`c` ViaV\_dVd Z`\_T`\_fCccVU Z`\_T`\_VTeZ`\_` hZeY UidecSfeZ`\_X dYRcVd W : ]Rdd @` Z`\_Tj fUz\_X` Sfe`\_e` ]`^ZeVU e` aRj ^V\_ed e` Sc` \Vcd` UVRjVcd` R\_U W\_R\_TzRj] Z`\_dZeFeZ`\_` d eYRe YRgV V\_eVcVU Z`\_e` dRjVd RXcVV^V\_ed hZeY cVdaVTe e` dYRcVd `W eYV Wf\_U) =Vvd Z`\_T`\_fCccVU f\_UVc eYV aJ`R` Ufcd`\_X eYV aVcZ`\_U V\_UVU Af`\_V`\_+`\_+`\_` Rcv UVeRj]VU Z`\_eYV JeReV^V\_e `W FaVcReZ`\_d)

8V^RP`[^ :RR\_NZQ 9d`VRz`\_ i KYV 9`RcU` W ;ZcVTe`cd Id cVda`\_dZs]V W`c` gVcdVvZ`\_X eYV Z\_gVde^V\_e RUgZid`c`d ^R\_R XV^V\_e R\_U `aVcReZ`\_d `W eYV Wf\_U) KYV UzCvTe`cd cVTVgV UVeRj]VU Z`\_W`c`ReZ`\_` RS` fe eYV Wf\_U R\_U Zed Z\_gVde^V\_e RUgZid`c` cVXfjRcj] eYc` fXY` fe eYV jVRc` R\_U ^VVe Re ]VRde bfrceVcj] hZeY ^R\_R XV^V\_e `W eYV Z\_gVde^V\_e RUgZid`c` e` cVgZVh cVa`ced RS` fe Wf\_U `aVcReZ`\_d) KYV Wf\_U`id` WZTVcd U`\_`\_e cVTVgV T`^av\_dReZ`\_` W`c` eYV Wf\_U)

=Z`R^SaZQ H^Nz\_NP`V[Z`\_ i KYV Wf\_U ^Rj V\_eVc Z`\_e` dVtfcZej ecR\_dRTeZ`\_d hZeY `eYVc 8^VcZTR`\_ :V\_efcj @\_gVde^V\_ed Wf\_Ud R\_U `eYVc Tj]V\_e RTT`\_f\_ed `W eYV Z\_gVde^V\_e RUgZid`c` Z`\_RTT`\_cUR\_TV hZeY eYV , 4/+ 8Te cf]Vd R\_U ac`TVUfcVd RU` aeVU Sj eYV 9`RcU` W ;ZcVTe`cd) KYV cf]Vd R\_U ac`TVUfcVd cVbZcV` R`^`\_X`\_eYVc eYz`\_Xd` eYRe eYVdV ecR\_dRTeZ`\_d SV ]VVVTeVU Re eYV Z`\_UvAV\_UV\_e TfccV\_e ^RcVVe acZTV `W eYV dVtfcZeZj] ;fcZ`\_X eYV aVcZ`\_U` eYV Z\_eVcllf\_U afcTYRdVd R\_U dRjVd hVcV 1.`-`/, R\_U , .4`3`/, /`cVdaVTe]Gj] KYV ]VVVTe `W Z\_eVcllf\_U ecR\_dRTeZ`\_d ` \_eYV JeReV^V\_e `W FaVcReZ`\_d hRd , , , , / Z`\_Ve cVRj]kVU XRZ`\_s`]`dd W`\_`\_ Z\_gVde^V\_e ecR\_dRTeZ`\_d)



.(=ZbR\_`YRZ` H^NZ\_NP`V[Z\_

GfcTYRdVd\_R\_U dR]Vd `ll\_gVde^V\_e dVTfcieZVd' ViT]fUz\_X dY`ce(eVc^ z\_gVde^V\_ed' ll`c eYV aVcZ`U V\_UVU Af\_V  
.+' -+- . hVcV , .-'011'4.3 R\_U ,0/' +22'+02' cVdaVTe[gVj))

/( 7N\V`NX GUN^R H^NZ\_NP`V[Z\_

KcR\_dRTeZ`\_d z\_dYRcVd `ll eYV llf\_U hVcV Rd ll`]]`hd5

	G/d Y [Z`U_ RZQRQ >aZR -*k , * , -		MRN^ RZQRQ 8RPRYOR^ -+k , * , ,	
	GUN^R_	5 Y [aZ`	GUN^R_	5 Y [aZ`
7XN__=)GUN^R_ 5a`U[^/fRQ	, . +++++'+		, . +++++'+	
J`]U	4, +'/+/'	, 3'.3.'.2,	, '-02'. -3	-2'401'3/0
@ddfVU z_cVz_gVde^V_e `ll UZdecZSfeZ`_d	, '3.'. / -	- , '1/4'/22	, '22'144	-1'.3-'. / ,
I VUVV^VU	\$40, '+. 2%	\$, 3'301'314%	\$, '01.'. , 44%	\$. /'33-', 3-%
	, ' / -'2+4	- , ' , 20'424	32, '3-3	, 4'/02'++/'
7XN__=)GUN^R_ 5a`U[^/fRQ	--0'++++'+		--0'++++'+	
J`]U				

KYV W`]]`hz\_Xld R df ^ ^Rcj `W eYV JVGv] T]RddZ[TReZ`\_d Rd `W aVcz`U V\_U) KYV JTYVUf]V `W@gVde^V\_ed ac`g!UVd  
RUUZeZ`\_R] z\_W`c^ReZ`\_`\_eYV If\_U:d a`ceW`]z`Y`]Uz\_Xd)

@RbR\ + @RbR\ , @RbR\ -

5\_\_R`\_

-ZbR`\_YRZ` GRPa^V`R\_

:`^`^`\_ Je`T\d

8 fe`^`S]V :`^a`\_V\_ed



2( FV\_W : NP` [ ^ \_

KYV gR]fV ` eYV f\_Usd dYRcVd hZ]] X` fa R\_U U` h` d` ^VeZ^Vd cRaZU]] `c f\_acVUZTeRS]] SRdVU ` eYV  
aVcIl`c^R\_TV ` eYV dVTfcZzVd ` h\_VU Sj eYV f\_U\_R\_U ` eYVc WRTe`cd XV\_VcR]]j R]]VTe\_X eYV dVTfcZzVd ^Rc\Ve)  
DRc\Ve cZd\vd` z\_T]fUz\_X a` ]zeTR]` cVXf]Re`cj` VT` ` ^zT R\_U d` TzR] UVgV]` a^V\_ed` TR\_R]]VTe eYV gR]fV ` eYV  
f\_Usd z\_gVde^V\_ed) ERefcR] UzdRdeVcd` afS]zT YVR]eY V^VcXV\_TzVd` hRc` eVcc`cZd^ R\_U ` eYVc f\_`cVdVVR]V  
VgV\_ed ^Rj ]VRU e` z\_TcVRdVU ^Rc\Ve g` ]ReZ]e] R\_U ^Rj YRgV RUGVcdV ]\_X(eVc^ V]]VTe d` \_ h`c]U VT` ` ^zVd  
R\_U ^Rc\Ved XV\_VcR]]j)

KYVcV RcV TVceRz` cZd\vd z\_g` ]gVU z` z\_gVde z\_X z` ]` cVzX` dVTfcZzVd) KYVdV cZd\vd z\_T]fUV eY`dV cVdf]ze\_X Ilc` ^  
a` ]zeTR] VgV\_ed \$dfTY Rd Tzgz] f\_cVde` \_ReZ` \_R] V]VTz` \_d R\_U z^a` dzeZ` ` ]ViTYR\_XV T` \_ec` ]d` d` TzR] R\_U  
VT` ` ^zT VgV\_ed \$dfTY Rd ]Rc`c decz\vd R\_U cZd z\_X z` ]ReZ` ` ]` R\_U \_RefcR] UzdRdeVcd) JVTfcZzVd ` ]]]` cVzX` zddfVcd  
^Rj SV ]Vdd ]]bzfU R\_U ^`cV g` ]ReZ]V) @\_gVde z\_X R dZ\_X z]zTR` \_e a` ceZ` ` ]` RddVed z` \_ V T` f\_ecj` `c vVXz` \_ ^Rj  
RTTV`\_efReV eYVdV cZd\vd)

3( : RQR^N^X HNd =ZS [ ^Y N^V [ Z

KYV S` ` \ (SRdZd TYRcRTeVc ` ] UZdeczSfeZ` \_d ^RUV Ufcz\_X eYV jVRc Ilc` ^ \_Ve z\_gVde^V\_e z\_T` ^V `c \_Ve cVR]kVU  
XRz`\_d ^Rj UZ]]Vc Ilc` ^ eYVc f]ze^ReV TYRcRTeVc]kReZ` \_ ]`c ]VUVcR] z\_T` ^V eRi afca`dVd) KYVdV UZ]]VcV\_TVd cV]]VTe  
eYV UZ]]VcZ`\_X TYRcRTeVc ` ] TVceRz` z\_T` ^V z^V^d R\_U \_Ve cVR]kVU XRz`\_d R\_U ]` ddVd ]`c ]z\_R\_TzR] deReV^V\_e R\_U  
eRi afca`dVd` R\_U ^Rj cVdf]e z\_cVT]Rddz]zTRz` \_ R` ` \_X TVceRz` TRa]zeR] RTT` f\_ed` \_ eYV ]z\_R\_TzR] deReV^V\_ed)

8d ` ] aVcZ` U V\_U' eYV T` ^a` \_V\_ed ` ] z\_gVde^V\_ed ]`c ]VUVcR] z\_T` ^V eRi afca`dVd hVcV Rd ]]]` hd5

=VUVcR] eRi T` de ` ] z_gVde^V_ed	1, /'124'3-,
>c`dd eRi RaacVTzReZ` ` ] z_gVde^V_ed	3, '0-0'-.4
>c`dd eRi UVacVTzReZ` ` ] z_gVde^V_ed	\$. , '4+-'.0+%
EVe eRi RaacVTzReZ` _ \$UVacVTzReZ` ` ] z_gVde^V_ed	/4'1--'334

KYV UZ]]VcV\_TV SVehVV\_ S` ` \ (SRdZd R\_U eRi (SRdZd f\_cVR]kVU RaacVTzReZ` \_ \$UVacVTzReZ` ` ] z ReeczSfeRS]V  
acZ`^RcZ]j e` eYV eRi UV]]VcR] ` ] ]` ddVd ` \_ hRdY dR]Vd)

# =Z\_R\_TZR] ?ZXY]ZXYed

: [^N GUN^R Ca`\_NZQIZT HU^ [aTU [a`UR MRN^\_ 9ZQRQ 8RPRYOR^ -+ #RdPR`N`\_Z[`RQ\$

DR^AGUN^R 8N`N

FN^V[\_ NZQ Ga \ \RYRZ`NX 8N`N

=ZP[YR : ^ [Y =Zbr`\_YRZ` C \ R^N^V [Z\_ %4

8V\_`^VOa^V [Z\_ : ^ [Y4

FN^V [ ` [ 5br^NTR BR` 5\_\_R`\_ [\$4

	BR` 5__R` JN^aR& 6RTVZZVZT [S DR^V [Q	BR` =Zbr`_YRZ` =ZP [YR #@ [__ \$^+ \$	BR` FRN^VfRQ NZQ I Z^R^N^VfRQ ; NIZ # @ [__ \$	H [ `NX : ^ [ Y =Zbr`_YRZ` C \ R^N^V [Z_	BR` =Zbr`_YRZ` =ZP [YR	BR` FRN^VfRQ ; NIZ_	8V_`^VOa^V [Z_	BR` 5__R` JN^aR& 9ZQ [S DR^V [Q	H [ `NX FR`a^Z`^.\$	C \ R^N^VZT 9d \ RZ_R #ORS [^R Rd \ RZ_R c N \ bR^\$	BR` =Zbr`_YRZ` =ZP [YR #@ [__ \$	BR` =Zbr`_YRZ` =ZP [YR #@ [__ \$	D [ ^ \$ [ W [ Ha^Z [ bR^ FN`R	BR` 5__R`_ & 9ZQ [S DR^V [Q #IZ `U [a_NZQ_\$	
7XN =															
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B[<sup>^</sup>R\_<sub>^</sub>[ :VZNPINX <VTUWTU`\_

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,\$% :<sup>^</sup>afeVU fd\_X RgVcRXV dYRcVd` fedR\_Uz\_X eYc`fXY` fe eYV aVcZ`U)

# 8aac`gR] `W DR\_RXV^V\_e 8XcVV^V\_e

8e R ^VVeZ\_X YVJU ` \_Af\_V -3' -+-. ' eYV =f\_Usd 9`RcU `W ;ZcVTe`cd \$eYV 9`RcU % f\_R\_Z^`fd]j  
Raac`gVU eYV cV\_VhR] `W eYV ^R\_RXV^V\_e RXcVV^V\_e afcdfR\_e e` hYZTY 8^VcZTR\_ :V\_etcj  
@\_gVde^V\_e DR\_RXV^V\_e' @\_T) \$eYV q8UgZd`cr% RTed Rd eYV Z\_gVde^V\_e RUgZd`c`c eYV =f\_U) L\_UVc  
eYV @\_gVde^V\_e : `^aR\_j 8Te `W ,4/+ \$eYV q@\_gVde^V\_e : `^aR\_j 8Ter% T`\_ecRTed W`c Z\_gVde^V\_e  
RUgZd`c j dVcgZTVd RcV cVbfZcVU e` SV cVgZVhVU' VgR]fReVU' R\_U Raac`gVU Sj R ^R[ `cZej `W R W f\_Usd  
; ZcVTe`cd `Z\_T]fUZ\_X R ^R[ `cZej `W eYV Z\_UVaV\_UV\_e ; ZcVTe`cd`VRTY jVRc)

GcZ`c e` Zed T`\_dZUVcReZ` `W eYV cV\_VhR] `W eYV ^R\_RXV^V\_e RXcVV^V\_e' eYV ; ZcVTe`cd cVbfVdeVU  
R\_U cVgZVhVU UReR R\_U Z `c^ReZ`\_ T` ^aZ]VU Sj eYV 8UgZd`c R\_U TVceRZ` Z\_UVaV\_UV\_e UReR ac`gZUVcd  
T`\_TVc\_Z\_X eYV =f\_U) KYZd cVgZVh hRd Z`RUUZel`\_ e` eYV `gVcdZXye R\_U VgR]fReZ`\_ f\_UVceRIV\_Sj eYV  
9`RcU R\_U Zed T` ^`ZeeVvd ` \_R T`\_eZ\_fR] SRdZd R\_U eYV Z `c^ReZ`\_ cVTVgVU hRd dfaa]V^\_eR] e`  
eYV Z `c^ReZ`\_ eYRe eYV 9`RcU R\_U Zed T` ^`ZeeVvd cVTVgV R\_U T`\_dZUVc `gVc eZ^V)

@\_T`\_VTel`\_ hZeY Zed T`\_dZUVcReZ` `W eYV cV\_VhR] `W eYV ^R\_RXV^V\_e RXcVV^V\_e' eYV 9`RcU sd  
cVgZVh R\_U VgR]fReZ`\_ `W eYV dVcgZTVd ac`gZUVU Sj eYV 8UgZd`c R\_U Zed R W Z]ReVd Z\_T]fUVU' Sfe hRd  
\_`e ]Z^ZeVU e`

- eYV\_RefcV` VieV\_e' R\_U b fR]ej `W Z\_gVde^V\_e ^R\_RXV^V\_e' dYRcVY`]UVc dVcgZTVd'  
UZdecZSfeZ`\_ dVcgZTVd' R\_U `eYVc dVcgZTVd ac`gZUVU e` eYV =f\_U6
- eYV hZUV cR\_XV `W ac`XcR^d R\_U dVcgZTVd eYV 8UgZd`c R\_U `eYVc dVcgZTV ac`gZUVcd ac`gZUV  
e` eYV =f\_U R\_U Zed dYRcVY`]UVcd ` \_R c` feZ\_V R\_U \_` (c` feZ\_V SRdZd6
- eYV =f\_Usd Z\_gVde^V\_e aVcl`c^R\_TV T` ^aRcVU e` Raac`acZReV SV\_TY^Rc]d R\_U\*`c aVVC  
Xc`fad `W `eYVc ^fefR] Wf\_Ud hZeY dZ^Z]Rc Z\_gVde^V\_e `S[VTeZgVd R\_U decReVXZVd6
- eYV T`de `W `h\_Z\_X eYV =f\_U T` ^aRcVU e` eYV T`de `W `h\_Z\_X dZ^Z]Rc]j (^R\_RXVU Wf\_Ud6
- eYV 8UgZd`csd T` ^a]R\_TV a` ]ZTVd' ac`TVUfcVd' R\_U cVXf]Re`cj ViaaZV\_TV\_R\_U eY`dV `W  
TVceRZ`\_ eYVc dVcgZTV ac`gZUVcd6
- eYV 8UgZd`csd decReVXZT ajR\_d' XV\_VcR]]j' R\_U hZeY cVdaVTe e` RcVRd `W YVZYeV\_VU  
cVXf]Re`cj Z\_eVcVde Z\_eYV ^fefR] Wf\_U Z\_Ufdecj R\_U TVceRZ`\_cVTV\_e XV`a`]ZetR]R\_U `eYVc  
ZddfVd6
- eYV 8UgZd`csd SfdZ\_Vdd T`\_eZ\_fZe j ajR\_d' gV\_U`c ^R\_RXV^V\_e acRTeZTVd' R\_U Z `c^ReZ`\_  
dVTfcZej acRTeZTVd6
- eYV T`de `W dVcgZTVd ac`gZUVU e` eYV =f\_U' eYV ac`WZeRSZ]ej `W eYV =f\_U e` eYV 8UgZd`c' R\_U  
eYV 8UgZd`csd WZ\_R\_TZ] cVdf]jed `W `aVcReZ`\_6
- a`dd[S]V VT`\_`^ZVd @  
jed `W `aVcReZ`\_6 @ VT @ ` e7 @ VXf U @ eY @ @  
@ @ @ @ V @ V  
j Z  
RTe `d S ^ `^

@\_UVTIUZ\_X e`cV\_Vh eYV ^R\_RXV^V\_e RXcVV^V\_e' eYV 9`RcU SRdVU`zed UVTIdz`\_`\_R\_f^SVc`||  
||RTe`cd'z\_T]fUZ\_X hzeY`fe]z^zeReZ`\_eYV||`]]`hz\_X5

a`cell`]z`gR]fRez`\_dVcg:TVd' RfU[ez\_X dVcg:TVd' R\_U]VXR] R\_U`aVcRez`\_R] T`^a]R\_TV RTe]g]e]Vd) KYV





# CzbfzUzej Izd\ DR\_RXV^V\_e Gc`XcR^

KYV =f\_U YRd RU`aeVU R ]zbfzUzej czd\ ^R\_RXV^V\_e ac`XcR^ \$eYV qac`XcR^r%) KYV =f\_Usd 9`RcU `W ;ZcVTe`cd \$eYV 9`RcU % YRd UVdZX\_ReVU 8^VczTR\_ :V\_efcj @\_gVde^V\_e DR\_RXV^V\_e' @\_T) \$q8 :@Dr% Rd eYV RU^z\_zdecRe`c `W eYV ac`XcR^) GVcd`\_\_Vj `W 8 :@D `c Zed RIMZ]ReVd' z\_T]fUz\_X ^V^SVcd `W 8 :@Dsd @\_gVde^V\_e FgVcdZXye : `^ ^ZeeVV hY` RcV ^V^SVcd `W 8 :@Dsd @\_gVde^V\_e DR\_RXV^V\_e R\_U >]`SR] 8\_R]jeZTd UVaRce^V\_ed' T`\_UfTe eYV URj(e` (URj `aVcReZ` \_ `W eYV ac`XcR^ afcdfR\_e e` eYV ac`XcR^)

L\_UVc eYV ac`XcR^' 8 :@D ^R\_RXVd eYV =f\_Usd ]zbfzUzej czd\ hYZTY Zd eYV czd\ eYRe eYV =f\_U T` f]U

# 8UUzē`\_R]@\_W`c^ReZ`\_

D^[de J[`VZT D[X/PVR\_

8 UVdTcZaeZ`\_`W eYV a`j]TzVd eYRe eYV Wf\_U#d Z\_gVde^V\_e RUGzd`c fdVd Z\_ViVcTzdZ\_X eYV g`eZ\_X cZYed Rdd`TzReVU hZēY eYV dVTfcZēZVd afcTYRdVU R\_U\*^c YV]U Sj eYV Wf\_U Zd RgRz]RS]V hZēY`fe TYRcXV' fa`\_cVbfVde' Sj TR]]Z\_X ,(3++(.23(4323) @ē Zd R]d` RgRz]RS]V`\_ 8^VcZTR\_ :V\_e f c j @\_gVde^V\_eds hVSDzēV Re R^VcZTR\_TV\_efc j)T`^\*ac` i j R\_U`\_eYV JVTfcZēZVd R\_U <iTYR\_XV :`^`^ZddZ`\_sd hVSDzēV Re dVT)X`g) @\_W`c^ReZ`\_cVXRcUz\_X Y`h eYV Z\_gVde^V\_e RUGzd`c g`eVU ac`iZVd cV]ReZ\_X e`a`cell`]z` dVTfcZēZVd UfcZ\_X eYV ^`de cVTV\_e ,-(^`\_eY aVcZ`U V\_UVU Af\_V .+ Zd RgRz]RS]V`\_ R^VcZTR\_TV\_efc j)T`^\*ac` i j) @ē Zd R]d` RgRz]RS]V Re dVT)X`g)

EaN^`R^Ye D[^`S[XV[ 8V\_PX[\_a^R

KYV Wf\_U Wz]Vd Zed T`^a]VeV dTYVUf]V `W a`cell`]z` Y`]Uz\_Xd hZēY eYV JVTfcZēZVd R\_U <iTYR\_XV :`^`^ZddZ`\_ \$J< : % W`c eYV Wz cde R\_U eYz cU bfRceVcd `W VRTY Wz dTR] jVRc Rd R\_ViYZSZe e`Zed cVa`ced`\_ =`c^ E(GF I K) KYVdV a`cell`]z` Y`]Uz\_Xd RcV RgRz]RS]V`\_ eYV Wf\_U#d hVSDzēV Re R^VcZTR\_TV\_efc j)T`^ R\_U' fa`\_cVbfVde' Sj TR]]Z\_X ,(3++(.23(4323) KYV Wf\_Usd =`c^ E(GF I K cVa`ced RcV RgRz]RS]V`\_ eYV J< : sd hVSDzēV Re dVT)X`g)

$E \sim Vd$

$E \sim Vd$

$E \sim Vd$





: ` \_eRTe Ld

R^VcZTR\_TV\_efcj)T`^

8 fe`^ReVU @ `c^ReZ`\_Cz\_V , (3++(. /O(3210

@\_gVde^V\_e Gc`WVddz`\_R] JVcgZTV I VacVdV\_eReZgVd , (3++(. /O(1/33

KVJVT`^ ^ f\_ZTReZ`\_d I VJRj JVcgZTV `c eYV ; VR# 2, ,

5 YR^VPNZ 7RZ`a^e JN^NNOXR D [ ^S [W [ \_& =ZP(

=Zbr`\_YRZ` 5Qbv\_ [ ^

8 ^VcZTR` : V\_efcj @\_gVde^V\_e DR\_RXV^V\_e' @\_T)

BR\_dRd : :ej' Didd`fcz

( ) /% . - / ! ! , \$ 1(% 0!1% + % , 10 ) 1 # - , ! ! , 0 ! /% 02" + ) 11%\$ & - / 1(% ' % , % / ! \* ) , & - / + ! ! ) - , - & - 2/ 0 (! /% ( - \* % / 0 ( % /% . - / ! ) 0 , - 1 ! 2! (- /) 5%\$ & - / \$) 01/ " 2! ) - , 1- . / - 0 . % # 1) 3% ) , 3% 01 - / 0 2 , \* % 00 . /% # % \$ % \$ - / ! # # - + . ! , ) % \$ " 4 ! , % & # % # 1) 3% . / - 0 . % # 120

h , \* , - 5 YR^VPNZ 7RZ`a^e D^ [ V^R^N^e < [XQZT\_& =ZP( 5X ^TU`\_ ^R\_R^bRQ( 7@'G5B'3,32- , - \* 2