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.-/!(%A(8!(.-/&+!&-!(86,(!&'(l3-++!-.!32.(l)&+()5!2%,3682%7!2%,/(+)(8!+()/,'!)%8!/(+,6(!,)4),2&@!
)%8!)!4/(82,&)*3(!82+(O*)/1)&2-%!O(,')%2+O#!

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S#! \$%! &' (!+(, -%8!A((!-!E4/235!\$&)3@!)%8!+6*+(^6(%&&3@!)3+!B)3&)!8(,3)/(8!&')&!%(2&' (!-!&' (2!
/(+4(,&2G(!4-!/&+!, -638!*(!, -%+28(/(8!&-!*(!)!a43),(!-!+).(&@!),, -/82%7!&-!&' (! ;)O*6/7!
<-%G(%&&2-%!-%!B)/2&2O(!C()/,'!)%8!=(+,6(!86(!&-!&' (!<] ^\$! J"N!+2&6)&2-%!)%8!b!2%!&' (!,)+(!-!
B)3&)!J!-G(/+&/(&,'(8!/(, (4&2-%!,)4),2&2(+#!E+!. -/!\$&)3@5!&' 2+)..(, &(8!-%3@!: U]!G(++(3+/(+,62%7!

)%8!2%&(/, (4&2-%+!*@!&' (!Y2*%)%! \leq -)+&!U6)/8!2%1&' (!Y2*%)%!C==5!')+!, -%&/2*6&(8!&-!)!+2&6)&2-%!2%!
A' 2, ' !O-/(!*-) &+!)/(1&/)G(32%7!.6/&' (!./-O!&' (!Y2*%)%!, -)+&!&' 2+!@()/!&')%!3)+&!@()/!2%!-/8(/!&-!
4)++!* (@-%8!&' (!Y2*%)%!C==!)%8!+((1!/(+, 6(!*@!R6/-4())%!), &-/+!-!)/2G(!8/(/, &3@!2%!R6/-4(#F' 2+!
,)%!2%, /()+&' (!3G(3!-!/2+1!/(.67((+) %8!O27/)%&+!)/(.), 2%7!)&+()!-%!&' (+(!3-%7(!?!-6/%(@+5!
8(+42&(1+O6773(/+!)44()/2%7!&-!')G(!7(%(/)33@!/(86, (8!-G(/, /-A82%7!-%!*-) &+!)%8!4/-G28(8!O-/(!
A2&' !+)&(332&(14' -%(!+, -O4)/(8!&-!LM''P#! I (&, &2-%!-!.*-) &+!*@!)(/2)3!+6/G(23)% , (!)%8!2%, /()+&!
,)33+!-!/' (34!./-O!*-) &+!')G(!' (34(8!/(86, (!&' (!%6O*(!-!8) &' +!+!-!)/5!*6&!A2&' !)/-6%8!XM!
4(-43(!6+6)33@!-%!(), ' !2%.3)&*3(!*-)&5!)%@!,)4+2d(!-!18(.3)&2-%!)&+()!./-O!' (34!A-638!+--%!
/(+63&!2%!O)%@!O-/(!8())&' +#!

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"M#!\$%1&' (!R)+&(/%!B(82&(//)%() %5!9: ; <=!')+!), 33(8!-!/!)%!(%8!&-!46+' J*) , 1+!)&+()!)%8!-!/!)+@36OJ
+((1(/+! &-!')G(!) , , (+!&-!)+@36O! 4/-, (86/(+#!' \ ' 23(! &' (! ; (33(%2, !<-)+&! U6)/8!')+!' -A%!
(H, (4&2-%)3!8(82,)&2-%!)%8!, -6/)7(!&-!+G(!, -6%&3(+!/(.67((!)%8!O27/)%&!32G(+!)&+()5!&' (!4/(+%&!
)33(7)&2-%+!7-!7)2%&!U/(, (>+!2%&(/%)&2-%)3!- *37)&2-%+!)%8!),)%(H4-+(14(-43(!&-!7/)G(!8)%7(/#!

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""#! f-+&J82+(O*)/1)&2-%!4/-, (86/(+!)2+(!82../(%&!4/-&(&, &2-%!, -%, (/+%!2%!: -/&' !E./2,)5!4/(+%&2%7!!
+4(, 2.2, 1+(, 6/2&@!/2+1+!+6, ' !)++! -&2%7+5!+' (332%75!)%8!8(&(%&2-%!2%!Y2*%)5!)%8!32O2&(8!) , , (+!&-!
4(/+-%+! 6%8(!' 9: ; <=>! O)%8)&! 2%! 8(&(%&2-%! -!)&! /2+1! -! /(. -63O(%&5!) +! A(3!) +! %)//-A!
4/-&(&, &2-%!+4), (!-!/4(/+-%+!A2&' !82G(/+(!4/- .23(+!2%!E37(/2)!)%8!B)6/2&)%2)!

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"L#!\$%! /(+4-%+(! &-! &' (! 4/-&(&, &2-%! /2+1+! .), (8! *@! 2%82G286)3+! A2&' ! 82..(/(%&!)7(+5! 7(%8(/+!)%8!
*), 17/-6%8+5!2%, 3682%7!&/) .2, 12%75!(H43-2&)&2-%!)%8!G2-3%(), (5!9: ; <=!,)33+!-!/&' (!2O43(O(%&)&2-%!
-! +&(/%7&' (%(8! , --/82%)&2-%! A2&' !),)8(O2, ! 2%+&2&6&2-%+5! 2%, 3682%7! -%! 82+, 3-+6/(!)%8!
28(%&2.2,)&2-%!-!4/-&(&, &2-%!%(8+5!)%8!), , (+2*3(!+(/G2, (+#!

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"Z#!_/-O!0)%6)/@! LM''N! &-! 06%(! LMLM5!) * -6&! Z5ZMM! =-' 2%7@)! (O*)/1(8! -%!)!?!-6/%(@), /-++! &' (!
E%8)O)%!C()!)%8!D)@!-!D(%7)3#!E!+O)33!%6O*(!/-!D)%73)8(+!2!)%8!-&' (!B@%O)/!%)&2-%)3+!
')G(!)3+!-6%8(/&)1(%!&' 2+!?-6/%(@#!E!O2%-/2&@!/(, ' (8!B)3)@+2)5! &' (2! 2%&(8(8(+&2%)&2-%5!
-&' (/+!A(/!2%&(/, (4&(8!)&+()5!&6/%(8!*), 1!)&(/+4(%82%7!+(G(/)3!O-%&' +!&/)%8(8!)&+()5!-!
&' (2!+! 24!A/(, 1(8!-!/A)+ (8!)+' -/(186(!&-!(%72%(!&/-6*3(!-!/*)8!A())&' (/#!

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"Q#!\$%! /(+4-%+(! &-! &' (+(! O-G(O(%&+5!+-O(!, -)+&)3! +&)&(+! ')G(! 2O43(O(%&(8! 2%&(/, (4&2-%!)%8!
46+' *), 1! O() +6/(+5! &-! 4/(G(%&! -%A)/8!?!-6/%(@+!&-A)/8+! &' (2! &(/2&-/@#!\$%! &' (!) *+%, (!-!
)8(`6)&(!+()/, ' J)%8J/(+, 6(! (.../&+5! &' (+(! 4/), &2, (+! ')G(!/(+63&(8! 2%!(.67((+) %8! O27/)%&+!
/(O)2%2%7!+&/)%8(8!)&+()!2%18)%7(/-6+!, 2/, 6O+&)% , (+!-!/+(G(/)3!O-%&' +!) * -)/8!G(++(3+#!

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"[#!E&13()+&! "PM! =-' 2%7@)!/(.67((+')G(!82(8!-!/7-%(!O2++2%7!2%!&' (!E%8)O)%!C()!)%8!&' (!D)@!-!
D(%7)3!+2%, (!0)%6)/@! LMLM5! 2%, 3682%7! "SS! 2%! &' (! ./+&! ')3!-! LMLM#! =(.67((+) &+()!). , (!32.(J
&' /())&(2%7! 82+&/(+++2&6)&2-%+! 86(! &-! 6%+())A-!&' @! G(++(3+5! 6%4/(82, &)*3(!+()!)%8! A())&' (/!
, -%82&2-%+5!+! -/&)7(+!-!.-8!)%8!A)&(/5!)%8!4' @+2,)3!)%8!+(H6)3!) *6+(!*@!+O6773(/+#!

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"S#!C-O(!+&)&(+!8(O-%+&/)&(8!&')&!/+(, 6(!)&+()!)%8!+6*+(`6(%&!82+(O*)/1)&2-%!),)%!*(!O)%7(8!
+). (3@5!2%!(+4(, &-!)8(`6)&(!O() +6/(+!&-!O)%7(!46*32, !' ()3&' !/2+1+#!\$%!&' (!./+&! ')3!-! LMLM5!

Z!¹' &&4+eccAAA#6%' ,/#-/7c%(A+c*/2(.2%7cLMLMcSc[(ZZ)S.Qc6%' ,/J,)33+J7/((, (J2%G(+&27)&(J46+' *), 1+J+()J
3)%8J*-/8(/+J&6/1(@#'

D)%73)8(+ ' 5!B)3)@+2)!%8!\$%8-%(+2)!2O43(O(%&(8!')3&' !+, /((%2%7!)%8!`6)/)%&2%(!)//)%7(O(%&+!
.-/!4(/+-%+!/(+, 6(8!)&!+()#!

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"P#! 9: ; <=! ')+!), &2G(3@! (%7)7(8! A2&' ! C&)&(+!)%8! -&' (/! +&)1(' -38(/+! 2%! &' (! / (72-%! &-! 4/-O-&(!
4/-&(, &2-%!)&!+()!)%8!/(+4-%+2*232&@!+')/2%75!2%, 3682%7!, --/82%)&(8!+()/, ' !)%8!/(+, 6(5!(`62&)*3(!
)%8!4/(82, &)*3(!82+(O*)/1)&2-%!-4&2-%+5!)%8!+, /((%2%7!O(, ')%2+O+#!_!/!2%+&)% , (5!2%!\$%8-%(+2)5!
B)3)@+2)!%8!D)%73)8(+ ' 5!9: ; <=! ')+! (%7)7(8!86/2%7!&' (!/(4-/&2%7!4(/2-8!A2&' !%)&2-%)3!, -)+&!
76)/8!)7(% , 2(+!)%8! , -%86, &(8!,)4), 2&@!*62382%7!2%2&2) &2G(+!&-!4/-O-&(!)%8!+644-!&!4/-&(, &2-%!
+(%+2&2G(!/(+4-%+(!&-!&' (!%((8+!-.!4(/+-%+!/(+, 6(8!)&!+()#!_6/&' (/O-/(5!9: ; <=!)%8!4)/&%(/+!+6, ' !

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LZ#!\$%&' (!, -%&(H&!- !&' (!=(.67((!)%8!B27/)%&+!B63&2JC(, &-/!)%8!&' (!B2H(8!B27/)&2-%!\ -/12%7!U/-645!
9: ; <=!)%8!\$] B!, -%&2%6(!&-!3()8!&' (!' 6O)%2&)/2)%!/(+4-%+(!. -/!O27/)%&+5!)+@36OJ+(1(/+)%)8!
/(.67(+12%!I (O(%5!2%, 3682%7!&' -+(!)/2G2%7!*@!+)#!C644-!&!. -/!/C, (4&2-%5!/(72+&/) &2-%!)%8!/(.67(!
+&)&6+!8(&/O2%)&2-%!2+!4/-G28(8!*@!9: ; <=5!)3-%7!A2&' !' ()3&' !,)/(5!.2%)%, 2)3!)%8!-&' (!/!)+2+&)% , (!
+(/G2, (+#! F' (! E++2+&(8! C4-%&)% (-6+! =(&6/%+! VEC=W! -.! C-O)3! /(.67((+! +644-!/&(8! *@! 9: ; <=!
8(/C)+(8!86/2%7!<] ^\$! ! "N! 4)%8(O2,5! ' -A(G(!, -6%+(32%7! &' /-67' !' (34! 8(+1+!, -%&2%6(8!2%!
E8(%#!

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