!"#!\$#"%&'()*+(,&-.)/(+012(,&3((.456&70.(8))))

"#\$%&!'(#)*&!'+, *!-. &#/*'0!'*/!'+, *!1+2/*3/!#2&!*'/#45% (!2+), '!6+)!6-/-)*!, **/%27'8!9(#)*&! 5+1#/%+2!+6!#55!\$%&*+'!#2&!, **/%27'!2+/*'!+2!/(*!: *4'%*8!; 55!'/#<*(+5&*)!, **/%27'!6+)!#55!7)+-.'!

/*#1(%27!#2&!5*#)2%278!B(*!.-).+'*'!+6!/(*'*!, **/%27'!#)*!/+!-2&*)'/#2&!: (#/!/(+'*!#)*!'+!: *!

#)*!#55!/)#2'.#)*2/!6+)!#55!/+!'**8!!=>?@'!(#'!#&&*&!#2+/(*)!5#A*)!+6!'/)*''!'*.#)#/*!6)+,!

1#2!% .)+\$*!%8!B(#2<!A+-!6+)!7%\$%27!A+-)!/% *8!C*!)*1*2/5A!'-44*&!#/!D*)%!%2!#!EFG!1+, 4+! 15#''!#6/*)!#2!*, #%!: %(!5#)7*!1#55+-/!+2!H)%&#A8!B(*!)*#'+2!(*!'(#)*&!%!/(#/!: *!<2+:!'+, *!+6! %!%!'/)-1/-)*&!-2&*)!/(*!1-))*2/!, +&*58!!I (*2!: *!1+, *!4#1<!%2!J#2-#)A0!: *!2**&!#!&%6*)*2/! . 5#28!I *!#)*!: +)<\(\alpha\)7!+2!(\(\alpha\)\(\alpha\)78!I *!<2+: !/(#/!: (*2!+-)!'/-&*2/'!&+2\(\begin{align*} 1 \)/! (#\$*!#11*''!/+!'1(++5! /(*)*!#)*!, +)*!.)+45*, '!)*5#/*&!/+!/(*%)!+: 2!: *554*%278!!1 *!(#\$*!4**2!2*7+/\(\mathreal{#}\)%27!#2&!(#\$\%27! 1+2**)'#/%+2'!: %(!=?L; 8!; !5+/!+6!-2<2+: 2'!)*5#/*&!/+!'/% -5-'!#2&!1+-2/A!2-, 4*)'!#6/*)!/(*! $(+5\%4^{\circ}-1)^{\circ}$ $(-5\%4^{\circ}-1)^{\circ}$ $(-5\%4^{\circ}-1$ /+!7%*!*\$*)A+2*!. *#1*!+6!, %2&!#2&!5*/!*\$*)A+2*!<2+: !: *!#)*!7+%27!/+!1+2/%2-*!: (#/!: *!#)*! &+%278!I *!&%&!2+/!7*/!/+!N-*'/%+2'!5#'/!/% *!#2&!4*1#-'*!/(%!%!#2!#&\$%+)A!7)+-.!#2&!: *! $: +-5&!5\%*!*\$*)A+2*!/+!#7)**!/(#/!A+-)!\$+\%*!\%!)*.)*'*2/#/\%*!+6!A+-)!'\%*!+)!7)+-.!'+!4*\27!$ #27)A0!\$*2/\(\alpha 7!+\)!. +5\(\mathreal\) \(\alpha \) \(\alpha 7!/\) \(\mathreal\) \ (*5. !, #<*!&*1% \(\frac{1}{2}\)! \(\frac{1}{4}\)2\\\!\!#2\\!#!7\)+-.!/(\(\frac{4}{1}\): \(\frac{1}{4}\)! \(\frac{1}{4}\): \(\frac{1}{4}\)! \('+-)1*'!+6!)*#5!8#5+7-*!2!8*18*+2!, #<278!!66!: *!1#2!#7)**!/(#/!, <math>+\$27!6+): #)8!/(#/!: *!: %5!-'*!/(%!, **/%27!/+!(#\$*!1+2\$*)'#/%+2'!#2&!4*!'+5-/%+2!6+1-'*&!#2&!#\$+%&%27!1+20*1/-)*8!@!A+-! #)*!-2#45*!/+!&+!'+!/(*2!, #A4*!'*5*1/\(\gamma\)7!\(\psi2+/(*)\)!.*)'+2!6)+, #A+-)!'\(\psi^*\)!/+!\(\gamma\)1/+\(\g B(*!7)+-.!#7)**&8!"#\$%&!'(#)*&!/(%!: %5!4*!6+)!)*'.*1/!#2&!/% *!1+2'%&*)#/%+2!+6!#558!!P#'/!/% *!

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$+5-2/#)A!#2&!. #%&!. **/\27'!6+)!'/)#/*7%'!#/!*#1(!'\%*8!@!: \%5!4*!&\%6*)*2/!#/!*#1(!'\%*!&-*!/+!
6#1%%%*'8!=()%!'(#)*&!, #2A!+6!(%!, *, 4*)'!: #2/!/(#/!4-/!/(*)*!%!% . #1/!%2!/(#/!7)#&*!5*$*5!
#28!1+, -2\%A!1+21*)2'8!
R*1<A!'(#)*&!/(*A!(#$*!&%1-''\hat{2}!#/!(*)!'\hat{4}*!\#!5*#&*)'(\hat{8}!7*/!6**&4#1<!+2!
1+, 6+)/!5*$*59!"#$\&!'(#)*&!/(#/!: (*2!(*!'*2&'!+-/!/(*!2*3/!.#)*2/!#2&!1+, , -2\%A!, *''#7*0!
(*!: %5!-'*!/(*!5#27-#7*!+6!. %+/!#2&!7)#&-#58!L$*)A/(%27!: *!(#$*!4**2!&+%27!%!7)#&-#5!#2&!
'#6*8!
ļ
W%|<!#'<*&!#4+-/!/(*!=>?@'!5*#$*!/(#/!*2&!+2!EGXYEXGZ!: %5!/(*)*!4*!'+, */(%27!%2!.5#1*!6+)!
/(\#/8!!=()\%!)^*' + 2\&^*\&!/(\#/!^*\$^*)A + 2^*!\%! + ./\% \%/\%!/(\#/!: (\#/*\$^*)!2^*: !. \#1<\#7^*!1+, *'!: \%5!(\#\$^*!)
/(*'*!4*2*6\%'8!!6!2+/0!/(*2!:+)<*)'1.1+, ...*2'#/2!:+-5&!4*!-'*&!6+)!2+:!-2/5!2*:!)*5%'6!
. #1<#7*!1+, *'!+-/8!' #$%!' (#)*&!(*!%!2+/!1+21*)2*&!#4+-/!/(*!, +2%'!2+/!1+, %270!%K'!0-'/!#!
, #//*)!+6!: (*2!#2&!(+: !, -1(!#2&!: %5!4*!)*/)+#1/%$*8!
D#&% +2!: %5!4*!#45*!/+!-'*!/(*!)*1!1*2/*)!#'!/(+'*!#)*!1%A!.)+.*)/%'8!B(*!+25A!5% %#/%+2'!#)*!
/(#/!'/-&*2/'!(#$*!/+!4*!%2!#!4-%&%27!/(#/!#)*!"9;!#..)+$*&!'+!: *!1#2K/!0-'/!7+!#2A: (*)*!
4*1#-'*!: *!2**&!/+!, **/!'#6*/A!'/#2&#)&'!6+)!'1(++58!
Q#)*2!D\%'(*: !'(#)*&!/(#/!*$*)A+2*K'!/(+-7(/'!#2&!6**5\\27!/()+-7(!/(*!. #2\&*, \\10!(#\$*!4**2!)
$*)A!&\(\mathbb{6}\)*2/!\(\mathbb{2}\)!-'!/+!4*!,\(\mathbb{1}\)*'.\(\mathbb{1}\)6-5!+6!&\(\mathbb{6}\)6*)*2/!\(\mathbb{2}\)!-'!/+!4*!,\(\mathbb{1}\)*'.\(\mathbb{1}\)6-5!+6!&\(\mathbb{6}\)6*)*2/!\(\mathbb{1}\).\(\mathbb{2}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/\(\mathbb{1}\)1-'!/+!4*!\(\mathbb{1}\)1-'!/\(\mathbb{1}\)
P%#!#'<*&!%!#2A!. +''%4%%A!/+!&+!'+, */(%27!: %(!D+2&#A'!/+!#55+: !6+)!. 5#22%27!/% *8!=()%!
'(#)*&!/(%!: #'!#!/+.%!+6!&%1-''%+2!/+&#A8!W+/!#!'%.5*!#2': *)!#2&!: %5!1+2/%2-*!/+!&%1-''!/+!
'**!%!. +''%45*8!
?\%/+)\%!! (*2!/(*!5+1<&+: 2!4*7#2!/(*!/*#1(*)'!)*#55A!4*2*6\%/*&!6)+, !/(*!&\%/)\%/!
1)*#/%27!/(*!.5#A5%/'8!C*)!9PT!7)+-.!(#&!#'<*&!6+)!'/% *2&!/+!&*$*5+.!, #/*)%#5'!4-/!: *)*!
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