!"#\$%&'%()*+,%

!"#"\$%&'(%)*+,-.+%/#0/(0"\$1%

								%
!	1	!	%					
	''#\$!%#&'#(!)*+(!	, -*.#&'*+	+(!!	!	!	!	/ 01!23456!3447!3854!! !
9	9:0;; ;=! ?	'*-#'	1 1	1	!	!	!	@==*:#1!3A8>!
3	344!B?C';-!	9+&##	#+D !BE&F ;	&'*C#!3!	1	!	!) #<<1!23456!8457G854!
9	% #&'#(!)*+(D!	''%!4	GA55!	!	!	!	!	H7 I E*<1! <u>J<e '="" -="" :="" ?\\#c?<="" j="" k*="" l="" u="">!</e></u>
!	!	1	!	!	!	!	!	<u>%;0-\\<e'k*lnie*<\\:;i< u="">!</e'k*lnie*<\\:;i<></u>
!	1	!	!	!	!	!		

• >%H) OPQH!

1 #\$\$%&%'(%)*"+%(,"'*"'-'./0%-"/*(%(12"345%*/55"'--6/.%(/."7##89:2"#8:9;<2"'5"'"=/*46/." >4&&";6)\$/55)6"%*"(,/"\$%/&.5")\$"'*."6/&'(/."()">%*'*-/2"?'*'@/0/*(2"A/'./65,%B2" CB\{5(/0)\&)@12"DB/6'(\\) *5"E";6)F/-("?'*'@/0/*(2"G\&)3'\&"9(6'(/@1"E":45*/552"94BB\&1"

8, '\\$2"C(,\5"'*."H*(/6*'(\)*'\"?'*'@/0/*(I"

1

/;'+7**S**;:+;&E<!9V#:*E<*WE+*;-D!H*(/6*'(%)*'&"?'*'@/0/*(2"JI"K'1*/"J4%L/*@'"9-,))&")\$""

: 45*/55" ' * . "C*(6/B6/*/465, \B"\\# # 89 : \\2"O)P'"9)4(, / '5(/6*"Q*\P/65\\(12"RSST""

: 45%*/55" '*. "C*(6/B6/*/465, %B"M##89: N2"O)P'"9)4(, / '5(/6*"Q*%P/65%(12"!UUUV

 $X = \frac{1}{233} =$ $; +450(\&()2\langle) = "45'9\rangle)4+,)?\&(7)194\%4\#'''\&('\&\#()@2552-\&+.)A+4\#'3"+')2\langle)B\%433\rangle)$

8)*-/*(6'(%)*\">*'*-/""

C''4#9>)65&5''0)DE ?FGHI)

/) **RSHTP**) **!!OUH**/**RUROP@**''!

1"

#.P\\5)6\\"\X6I\X'P\\."J/0\&/12\C'5(/6*\O/+\"?/Y\\-)\\O*\P/65\\(1\"

 $T > R! X^* - E - :#$

RSST""

(6) = (0)

(**R**'' ^ , **R** ^ **H**9!

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A = 0 (/."\$&4/*-1")*";) &5,"

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- 946P/1"'*."/P'&4'(%)*"6/5/'6-,"(/-,*%Z4/5I" 8) 0B/(/*("%*"H=2" ? H92"CH92"X992"H ? 2" '*. "+/3"B '@/"./5%@*I" H*(/@6'(%P/"'BB6)'-,"()"6/5/'6-,"%*-&4./5"B,%&)5)B,12"B)5%(%P/"(,/)612"'*." 5('(%5(%-'&"0/(,).5I"))
-) #&+*=*#C! ^ &E +! _ &*+#&`!G6' *("H*5(\(4(/2"9(I"_), *c5"Q*\P/65\(12"Od 82"RSSS") 1 Q(%&%L/."9;992"AH ? XC;"'*."C^CO=Q9"5('(%5(%-'&"B6)@6'05I"
- **1 H9HRU**) **B!!2** \ P] **]9**!
- $8)^{-/*(6'(\%))} = P_{\%}'(\%)^{-2} = 4^{-1} \cdot 0^{-1} = 4^{-1} \cdot 0^$
- 8)*-/*(6'(%)*W': '5%-"C&/-(6)*%-5"'*."C&/-(6%-%(1"=,/)61"
- , **N9N!''E.(!>HYH!9:0;;**<!) #&+*=*:E+#D!O#==8"?/OB, %52"? %&&%*@()*2"=O2"!U[T"
- 8)*-/*(6'(%)*\"#P\'(%)*"C&/-(6)*\-52"X\@\('&"(/-,*)&)@12"8)0B4(/65"
- , **N9M!''E.(!RQ!R!9:0;;**<!) #&+*=*:E+#2"O # == 8"? / 0B, %52"? %&&%*@()*2"=O2"!U[a"
- 8)*-/*(6'(%)*W''8) 0B4(/6''9%04&'(%)*2''>&%@,(''9%04&'(%)*'')
- , **N9N!''E.(!OS!R!9:0;;<!)**#&+*=*:**E**+#D!O#==8"?/0B, %52"? %&&%*@()*2"=O2"!U[a"
- **R**[9]) &* **I** * **E**<!%?'+*:#2"9'&P/"`/@**'"Q**P/65*(1"MH#8: CN2"O/+B)6(2"`H2"!U[aV!UbS"
-) #.P\\$5)6\"X6I":/((1"_I"X'4@,/*3'4@,2"Q*\P/65\(1")\$"X/&'+'6/"
- 122%, & +4'&2+)@\$+#'&2+(I)
- $(5)F/-("=, /5\%5W"^{)} &4*(//6)@d(")123J4+0)A, \\ $#4'(2+)(2\%)12334+,)12+'(25)(4+,)$
- 8)*-/*(6'(%)*\"D6@'*\L'(%)*'&"?'*'@/0/*("
- >**!!9!!**>?'*-#''!**RCI***-*'+&E+*;-2"O1'-\"8)&&/@/2"7+%(.",%@,/5(".%5(%*-(%)*<"!UU]V!UU["

0U@XH99P@"R]!**3** a /HUPH")H! !

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5('\$\$*@2"-466\-4&40"./P/&)B0/*(2"'--6/.\('(\)*"54BB)6(I"`/B)6(/.".\6/-(&1"()"(,/";6)P)5("X6I"`)*"`4/@5/@@/62"(,/"^;"=6/'546/6"?6I"X'P\."_/***@52"'*."(,/";6/5\./*("X6I"X'P/"9-,6)/./6I!

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R'';:*E+#!/&;=#'';&!;=!X*-E-:#!E-C!P-+#&-E+*;-E<!>?'*-#''2"RSS!"f"RSSU"" O1'-\"8)&&/@/"9-,))&")\$":45*/552"O1'-\"'*."O/+"d)6\"8\%(12"Od" =/'-,*@"'("(,/"@6'.4'(/"&/P/&"*"'6/'5")\$"\$*'*-/2"*(/6*'(\)*'&"345*/552")B/6'(\)*5"O'*'@/O/*(2"/-)*)O\-52"/V-)OO/6-/2"/*(6/B6/*/465,\B"'*." O'*'@/6\'&"(,)4@,("E"/(,\-'&"\OB&\-'(\)*52"'*."6/5/'6-,"O/(,).5"'*."5('(\\5(\\-5I"

RCJ?-:+!/&;=#'';&D!5bbb73445!

H*"(,/"1/'6"RSS!2"./5%@*/."'*."%OB&/0/*(/.

4.9P"H99!3 a / HUPH") H!

8)*54&(%*@"

8)4*(12"OdI"

\$*(/6*'(\$)*'&&1I"

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 $^{-}-1:6/5$, /*("\$)6">4 = 0/">'-4 (12" #>="A)-'

• J %@, /6"C.4-'(%) *2": 45%*/55"X/P/&) B 0 /*(2"? '*4\$'-(46%*@2"9'&/5e? '6\/(%*@2"

• 8, '6%('3&/". %5(6%34(%)*")\$">)).2"8&)(,%*@2";)6('3&/"9, /&(/62"/(-I";'(/65)*2"O_" • ^%-/";6/5%./*("H*P/5(0/*(52"O)6(,/'5("9/-46%(%/52"H*-I2"#B6%&"!UU]"f"#B6%&"!UUUI" • H*P/5(/."\$)6"J%@,V*/(V+)6(,"-&%/*(52"/5('3&%5,/."'*."6'*"(,/"D6'*@/"8)4*(1" J / . @/">4* . 2''54B/6P(5/. "79/6(5''Ra<")(, /6''36))/(65''(**'6/@))*'4'')

• 8H9"78%(%-)6B"H*P/5(0/*("9/6P%-/5<":6'*-,"36)\/6'@/2"Od:"`/@%)*I""

• 8082">#2"X08"M8)0B4(/6"O40/6%-'&"8)*(6)&2">'-()61"#4()0'(%)*2"X%5(6%34(/." $O40/6\% - \frac{1}{8} = \frac{1}{2} + \frac{1}{$ ()) & * @ * / 6 * @ * / 6 * @ * · 54BB) 6 ("B6), 4 - (5 * * . 5 / 6 P - / 5 *) 6 >) 6 (4 * / 1 SS -) 0 B * * / 5

• ^%-/";6/5%./*("E"O'(%)*'&"9'&/5"'*."C*@%*//6%*@"?'*'@/62"O^#"?'-,%*/"8)0B'*12"

%*(/6*'(%)*'&&1"6/-)@*%L/."4&(6'VB6/-%5%)*"0'*4\$'-(46%*@"\$%605"7>)6(4*/"RSS<I" ? '*'@/."9'&/5"E"C*@%*//6%*@")6@ '*%L'(%)*g";eA"X%6/-("6/5B)*5%3%&%(1g"94BB&1"

1"

• >\%*'*-\%'\&"8)*54&('*(2"?/66\\&&"A1*-,2"_'*4'61"!UU!"f"_'*4'61"!UUaI" • :6'*-,"36)\/6'@/2"K'1*/2"O "'*."ah!""E"h!""Od 8"36'*-,/5I" • :6/5%./*(2"9\1&%*/"8)*54&(%*@"G6)4B2"H*-I2" '*4'61"!Ubb"f" '*4'61"!UU!I"

• 94BB&1"8, '*"E"A)@\5(\-5g">)6/\@*"CY-, '*@/"E"; '10/*(5I" • :6/5%./*(2"? ^"H*(/6*'(%)*'&"A%O%(/.2" '*4'61"!UUSV '*4'61"!UUR"

8, '*2">)6/\@*"CY-, '*@/2" J/.@*@2"G&)3'&"; '10/*(5I" • =/-,*%-'&"9'&/5"e"C*@%*//6%*@2"?'643/*%"#0/6%-'"8)6BI2"_4&1"!Ub!"f"

:6) 0 0 '2"9+/./*2"#B6\&"!Ubh"f" '*4'61"!UbbI"

• 9, \BB*@2"6\@@*@2"*5('&&'(\)*"E"(6'**@"\$)6"0'*4\$'-(46*@"515(/05I"

• 8O82">#2">? 8"%*"4&(6'VB6/-%5%)*"@6%*.%*@2"6)4*.%*@2"54B/6"\$%*%5.%*@"\$)6"

- O 8O"9/*'()6V'(V&'6@/2"RSRa"()";6/5/*("

- •
- ;6/5%./*("7?/03/6<"#6\"`/5/'6-,"8)*54&(%*@2"AA82"X/-/03/6"RSSb"()":6/5/*("
- Q^{*})*"X/&/@'(/2"#>="A)-'&"!bTU2" 4*/"RSRa"()";6/5/*("

- =6/'546/6'' # = A) k'' + bTU2'' + 4*/''RS + b'''RSRa''

• ? / 0 3/62">4&&" : /&&1"=)*%@,("7]S!"7-<7T<"M;COXHOGN"

• H*P/5(0/*("?'*'@/62"8%(%-)6B2"_'*4'61"!UUa"f"#B6%&"!UU]I"

5 P]PORUc!

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^%/(VO'0"C6'"^/(/6'*"7!U[TV!UbS<"J)*)6'3&/"X%5-,'6@/2"Q9"O'P12"!UbS" "

2H), UPO c!)] HRUR") H9!

 $H^{*}(600"l=)B^{9}/-6/(c^{9}/-460(1^{8})^{-6})^{-1}$

- ! K,)c5"K,)"%*"#0/6%-'2"RSS["C.%(%)*!
- ! K,)c5"K,)"%*"C.4-'(%)*2"RSS["C.%(%)*"
- ! K, c5"K, "%*" # 0 / 6% '2"RSS["C. <math>%%)*"
- ! K,)c5"K,)"%*"#0/6%-'2"RSSh"C. %(%)*"
- ! K, $c5^{"}K$, $\frac{1}{5}^{"} = 0/6\% \frac{2^{"}RSSa^{"}C}{5} \cdot \frac{1}{5}\%$
- " K,)c5"K,)"*"#0/6 '2"RSST"C. (%) *""
- >'-4&(1"#BB6/-%'(%)*"#+'6."f"#X8;";6)\$/55)6")\$"(,/"d/'62"RSSR"
 - H*.4-(/."*()"X/&('"?4"X/&('"O'(\)*'&":45*/55"J)*)6"9)-\/(12"TeUU"
 - ? /. '&')\$"^ '&)62"; '55 '%-"8)4*(1":)'6.")\$"8,)5/*">6//,)&. /652"\$)6"5 'P%*@"(+)"""
 - &\$P/5"\$*"\$-/"6/5-4/2" K/5(" ? \$&\$)6."=+BI">\$6/"X/B'6(0/*(2"beUhI"
 - ? /6%()6%)45"Q*%("8)00/*.'(%)*2"O'P'&"K'6"8)&&/@/"
 - Q9"O'P1"G))."8)*.4-("?/.'&"
 - O'(%)*'&"X/\$/*5/" ? / . '&"
 - 8)&."K'6"^/(/6'*"?/.'&"
 - CYB/6("; %5()&"?/.'&"
 - CYB/6("`\\$&/"?/.'&"
 - 79/P/6'&"8)00/*.'(%)*5"'*."#+'6.5"4B)*"`/Z4/5(<I"

- 8 'B%('&"9(64-(46/"'*."`%5\"()"(,/">%60"75//\%*@"-)V'4(,)65<"
- H*(/6*'(%)*'&"8)6B)6'(/"X/3("C\$\$/-("79E;"]SS<"7-466/*(&1".)60'*(<"
- O/+"; '6'. %@05"%*">%*'*-/"'*."8)6B)6'(/"X/3("7B)5("GA:<"7%*"6/5430%55%)*<"
- HOB6)P%5'(%)*'&"A/'./65,%B"7H*VB6)-/55"#:`"-)*\$/6/*-/<"
- H0B6)P%5'(%)*'&">%*'*-/"7-466/*(&1".)60'*(<"
- CB%5(/0)&)@1"%*"(,/"R!^{%!}"8/*(461"7-466/*(&1".)60'*(<"
- A/'./65, %B"%*"(,/"R!^{%!}"8/*(461"70)*)@6'B, "%*VB6)-/55<"
- 94BB&1"8, '%*"X%564B(%)*W">'%&46/5")\$"(%/6"!"'*."(%/6"R"54BB&%/65".46%*@"-)P%."
 7. '('"'--404&'(%)*"B, '5/<"
- G&)3'&%L'(%)*"'*."(,/",%../*"%0B'-(")\$")\$\$5,)6%*@"7B6)B)5'&"B6)-/55"4*./6"

9, 0, UH! **1** H9HRU) B!R" S! **:** HR) BP" ^!**;** "OHUH909!

^)6(/Y"=,/)61I"7Q*B43&5,/."0'*45-6%B(<"RSSTI"

!

"	$: Q9"TTTe" > \%*'* - /"D*VA\%*/2"B)5(/."()"/V-) \& /@/"+/3"5\%(/2"_'*4'61"RSSaI")$
!	j?'*'@/0/*(")\$"90'&&":'*\5">)&&)+%*@"C*'-(0/*(")\$"G6'002"A/'-,2":&&&/1Ik"" #-'./01")\$"C*(6/B6/*/46%'&">%*'*-/";6)-//.%*@52"#B6&&"RSSTI"
"	$ \begin{array}{l} 8 \\ 8 \\ 1 \\ 4 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1$
	$\begin{array}{c} pK/^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $
"	;43&%5,/."HA?"'*."-)465/"0'(/6%'&5"\$)6"#.P'*-/."?'*'@/0/*(e"?@("aSh2"\$)6"(,/" '.4&("/.4-'(%)*".%P%5%)*")\$"O1'-\"8)&&/@/I"9400/62"RSSRI"
"	pC.4-'(%)*"\$)6"8)00'*.2"8)*(6)&"'*."8))6.%*'(%)*">4*-(%)*5Ip" ;6)F/-(";'B/62"O1'-\"8)&&/@/2"#B6%&"!UU[I"
"	9(4.1\" J / ')4*(2"#((6'-(\)*"'*."`/(/*(\)*"*"^)-'(\)*'\"C.4-'(\)*" Q*B43\\5,/."9(4.1"B6/B'6/."'*."5430\((/."()"O_C#2"RSS!I"
"	p>&/Y%3&/"G6%*.%*@"8/&&"'("=`KIp" ?)./6*"?'-,%*/"9,)B"?'@'L%*/2"9400/62"!Ub[I" "

j?'*'@/0/*(")\$":'*\%*@"H*.45(61"\$)&)+%*@"/*'-(0/*(")\$"G6'002"A/'-,2"

: &\&/1Ik")46*'&")\$">*'*-\'&"?'*'@/0/*(2"7>? #<"?'1"RSSaI"



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```
6 @ "XHUH" ) H9% / OOH" SHS%
"
"H8 · C>"PSP1?"A ) 5" # *@ /k/5?" ? '6_ "! [!""E " #B6%
```

```
H8 : C>"RSR]2"A)5"#*@/&/52" ? '6-, "!['""E"#B6%&"!['"2"RSR]"7 : 45"C-)*"E">%*'*-/<"
# : `"RSRT2"9'*"#*()*%)2"=n2"D-()3/6"RSRT"
H=9"K)6&."8)*@6/55"Rb!""#**4'&"8)*$/6/*-/"RSRR2"A)5"#*@/&/52"9/B(/03/6"RSRR"
9 ? CeK/5(/-"RSR!2"A)5"#*@/&/52"9/B(/03/6"RSR!"
# : `"8)*$/6/*-/2"O/+"D6&/'*52" ? '6-, "RSRS"M0)P/."()")*&%*/".4/"()"8)P%.
```

H`#"'*."`/(%6/0/*(";&'*5"9/0%*'6g"X/-/03/6"!UU!g"?/66%&&"A1*-,";6%P'(/"8&%/*("

#&(/6*'(\\P/"\H*P/5(0/*(5"\\$)6"8Xc5g"O/+"_/65/1"9('(/">\\6/0'*c5"#55)-\\'(\\)*g"_4*/"

H*P/5(%*@"%*"G)P/6*0/*("9/-46%(%/5g"8/*(6'&"^'&&/1"^)&4*(//6">%6/"X/B'6(0/*(g"

 $\mathbb{H}^{P}/5(0 / (\#\&(/6*'(\mathbb{P}/5^{\$})6^{9}/\mathbb{N})65^{"*}."(,/"`\$5 \mathbb{P}/65/g"=,/"?e^{8})00'*./6g"$

8'6/\$4&"H*P/5(N*@g" J N@, &'*."? N&&5"9/*N)6"8N(NL/*5"8/*(/6g"!UUag" J N@, &'*."? N&&52"

9('(/"#55)-%'(%)*"#BB6)P/."H*P/5(0/*(5g"K/5("?%&\$)0B'*1"mhg"_4*/"

9('(/"#55)-%'(%)*"#BB6)P/."H*P/5(0/*(5g"K/5("?%%)6.">%6/"8)0B'*1"m]g"_4*/"

aST73<"'*."a][";&'*";6/5/*('(%)*g"?'6-,"!UURg";'55'%-"8)4*(1"CY/-4(%P/"

9('(/"#55)-%'(%)*"#BB6)P/."H*P/5(0/*(5g"; '6\"`%.@/">%6/0'*c5"`/&%/\$"

G6)4Bg"?/66%&&"A1*-,"8)*\$/6/*-/"8/*(/62"K'1*/2"O_"

!UURg"9('(/">\%6/0 '*c5"8)*P/*(\%)*g"#(&'*(\%-"8\%(12"O_"

#55)-%'(%)*g"_4&1"!UURg"; '6\"`%.@/2"O_"

_4*/"!UUag"K/5(";)%*(")*"(,/"J4.5)*2"Od"

? '6-,"!UUag"8/*(6'&"^'&&/12"Od"

!UUhg"K/5("?%&\$)6.2"O "

 $!UUhg" J / + ((2"O_""))$

Od"

%

? / 03/65, %Bg"8)4*(1"#.0%*%5(6'(%)*":4%&.%*@2";'(/65)*2"O_"

% < UR'' 09!

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BH9P9!RSQP9@U!

- 1
- #.P%5)6"\$)6"0)6/"(,'*"!SS"?'5(/6c5"A/P/&"(,/5%5"+)6\5"7O_8Q"E"#&&*'*-/" Q*%P/65%(12"'P'%&'3&/")*"6/Z4/5(<"

2HUQP) H!O@!"%), :R"S!OBH!) @TT, "POc!

9B/-\$'\$";)\$\$-/"D\$\$*-/62"=\$P/6()*";)\$%-/"X/B'6(0/*(2"=\$P/6()*2"`H""!U[]V!U[b" $#55\$5('*("#65)*"H*P/5(\@'()62"=\P/6()*">\%6/"X/B'6(0/*(2"!U[]"f"!UbS"$ $QBB/6"G6//*+))."A'\/"^)&4*(//6">\%6/"8)0B'*12"K/5("? \%$)6.2"O_""!Ub["f"RSSS"$ $K/5("? \%$)6."9/'6-,"'*."`/5-4/"=/'02"K/5("? \%$)6.2"O_""!UUaVRSSS"$ $K/5("? \%$)6."=)+*5, \%B"; \$'***@":)'6.2"K/5("? \%$)6.2"O_""!Ub["f"!UbU"$ $8)00\$55\)*/62"; '55'\%-"8)4*(1"; \$'***@":)'6.2"; '(/65)*2"O_""!UUS"f"!UUb"$ $?/03/62">4&*:/&\1"=)*\@,("7O)("$)6"B6)$\(<2"; '(/65)*2"O_""RSRS"f"B6/5/*("$ $=/*46/"E"; 6)0)(\%)*"8)00\((//2"O_8Q"9-,))\$")$": 45!3(")TjETQq0.-14!3("\SUFETQq0.-14"$

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