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

@*/*(''3%&7/<7/1#%

*

D) ' *2#<: #<63*, 2*() #3*+K1! D*DA*5"' %0"4*#<: #5%(' *() %(*+K1! D*%5) #' J' 3*#(3*6, %"30D) ' *' SB' 0#' <5' *#3*)#6) "4*J%"; ' : *&4*#(3*B%0(#5#B%<(3-*) %3*%*3(0, <6*#>B%5(*, <*B0, 2' 33#, <%"*: ' J' ", B>' <($\begin{array}{l} (, *_; ' 3(\#, <3^{*}\&, ; (*() ' \#0^{*}5, <2\#: ' <5' *\#<^{*}; <: ' 03(\%<: \#<6^{*}+(, 5=(, <3^{*}B, "\#5\#' 3^{*}\%)\#6<> ' <(* \cup \#()^{*}() ' *35), "\%0"4^{**}\#(' 0\%(; 0' -^{*}B' ' 0^{*'} J\%); \%(\#, <3^{*}\#<^{*}\%^{*}J\%0\#' (4^{*}, 2^{*}5, <(' S(3^{*}62\%5' /(, /2\%5' -^{*}, <"\#<' -^{*}"\%\&g3(; : \#, H-^{*}\%<: *0' 5, 6<\#$\#<6^{*'} 22' 5(\#J' *(' \%5) \#<60^{**} \end{tabular}$

- ?4*5, <(0%3(-*() ' *<, </+K1!D*0' 3B, <: ' <(3*)%: *>%<4*2' U' 0*3=#"3*U#()*U)#5)*() ' 4* 3(0, <6"4*%60' ' : -*U' 0' *>, 0' *3B0' %: *, ; (*%50, 33*() ' *2#J' *0' 3B, <3' *, B(#, <3*620, >* 3(0, <6"4*%60' ' *(, *3(0, <6"4*: #3%60' ' H-*U#()*() ' *)#6) ' 3(*B' 05' <(%6' 3*%(*%60' ' *%<: *
 ' #() ' 0*%60' ' q: #3%60' ' 0*
- *P' <' 0%""4-*+K1! D*B%0(#5#B%<(3*0' B, 0(': *>, 0'*5, <2#: '<5'*#<*()'#0*3=#""3*%3*B''0*
 'J%"; %(, 03-*) %: *3(0, <6'0*; <: '03(%<: #<6*, 2*+(, 5=(, <*B, "#5#'3-*%<: *2'"(*>, 0'*
 5, >2, 0(%&"'*%50, 33*: #22'0' <(*5, ; 03'*(4B'3*()%<*: #: *B%0(#5#B%<(3*U), *)%: *<, (*
 B%0(#5#B%(': *#<*+K1!D0*
- ?, ()*+K1!D*%<: *<, </+K1!D*0'3B, <: '<(3*2' "(*() '*"' %3(*5, <2#: '<(*#<*() '#0*3=#"'3*(, * 'J%"; %('*, <"#<'*%<: *"%&*, 0*3(; :#, *5, ; 03' 3-*&; (*

○ ?, ()*+K1!D*%<:*<, </+K1!D*0'3B, <: '<(3*#<: #5%(':*U#()*)#6)*B'05'<(%6'3*()%(*B''0*')'', %(#, <3*)%:*<, *, 0*>#<, 0

- 9*) #6) *B0, B, 0(#, <*, 2*M; <#, 0*2%5; "(4*%60' ': *6\bcH'()%(*B0' /, &3' 0J%(#, <* >' ' (#<63* %0' gU, ; ": *&' *; 3' 2; "*6Y^c*#<: #5%(': *<' #() ' 0*%60' ' *<, 0*: #3%60' ' -*bc*#<: #5%(': *
 : #3%60' ' Hi*] Vc*%60' ': *()%(*B, 3(/, &3' 0J%(#, <3*%0' gU, ; ": *&' *; 3' 2; "*6\Wc*#<: #5%(': *
 < ' #() ' 0*%60' ' *<, 0*: #3%60' ' -*XVc*#<: #5%(': *: #3%60' ' H0*K(*#3*B, 33#&" *()%(*() '*
 0' 3B, <: ' <(3*U), *#<: #5%(': *J%"; ' *#<*B0' *%<: *B, 3(*, &3' 0J%(#, <3*%0' *%"3, *() ' *3% >' *
 %BB0, S#>%(' *)%'2*()%(*)%J'*' SB' 0#' <5' : *() ' > 0**
- D, *3; >>%0#\$' -*%55, 0: #<6*(, *()' *' SB' 0#' <5' 3*, 2*M; <#, 0*2%5; "(4* >' > &' 03-* > %<4*B' ' 0*
 'J%"; %(, 03*%0' *<, (*: , #<6*()' *B0' /*%<: *B, 3(/%5(#J#(#' 3*2, 0*U) #5)*+K1! D*%: J, 5%(' 3*%<: *
 (0%#<3-%<: *U) #5)*%0' *&' <5) >%0=3*, 2*' S5' ""' <5' *#<*B' ' 0*' J%"; %(#, <*, 2*(' %5) #<60*93*
 #<: #5%(' : *&4*3, > ' *, 2*() ' *_; %"#(%(#J' *5, >>' <(3*#<*() ' *3; 0J' 4-*>, 0' *2%5; "(4*3), ; ":*
 &' *B%0(#5#B%(#<6*#<*K1! D*%<: *#<*%3' B%0%(' *_; ' 3(#, <-*() ' *M; <#, 0*2%5; "(4*)

B%0(#5#B%(#<6*#<*+K1!D*%<:*>, 3(*#<: #5%(':*()%(*()'4*)%J'*<, *(#>'*(, *:, *+K1!D*, 0*)%J'*5, <2"#5(#<6* 35)':; "'3*U#()*+K1!D0*

- K<('0'3(#<6"4-*&, ()*()'*+K1!D*GXWCH*%<: *<, </+K1!D*GYWCH*0'3B, <: '<(3*#<: #5%(':*()%(*3'33#, <3*()0, ;6), ;(*()'*%5%: '>#5*4'%0*U, ;":*&'*&'<'2#5#%"-*%<: *B%0(#5#B%<(3*: ;0#<6*+K1!D*%<: *#<*
 B'03, <%"*5, >> ; <#5%(#, <3*U#()*()'*5; 00' <(*+K1!D*"'%: '03*G@%()4*@"'#<-*7'6*8)#('-*a#\$*+), &'H*
)%J'*#<: #5%(':*()%(*()'4*U, ;":*"#='*0'20'3)'03*()0, ;6), ;(*()'*4'%00*+'33#, <3*()0, ;6), ;(*()'*4'%0*U, ;":*0'_;#0'*%: :#(#, <%"*2; <: #<6*5, >>#(>'<(3*20, >*()'*%: >#<#3(0%(#, <-*&; (*&'<'2#(*&, ()*
 B0'J#, ;3*+K1!D*B%0(#5#B%<(3*%<:*<, </+K1!D*B%0(#5#B%<(3*U), *%0'*; <U#"#<6*, 0; <%&"'*(, *: ,*()0''*
 +K1!D*: %43*#<*()'*3; >>'00*
- *?%3': *, <*()'*3; 0J' 4*2#<: #<63-*+K1!D*B%0(#5#B%<(3*&' <' 2#(*(0' >' <:, ; 3"4*20, >*()' #0*(0%#<#<6-*U) #5)* #<*(; 0<*&' <' 2#(3*M, <#, 0*2%5; "(4*%<: *' "' J%(' 3*() '*(' %5) #<6*50%2(*%50, 33*() '*; <#J' 03#(40*A; 0() ' 0-* M; <#, 0*2%5; "(4* >' >&' 03*#<: #5%(' *%*3(0, <6*B0' 2' 0' <5' *2, 0*(0%#<' : *B' ' 0*, &3' 0J' 03-*%<: *+K1!D* 5, <(%#<3* >%<4*' "' >' <(3*, 2*() '*B' ' 0*' J%"; %(#, <*B0, 5' 33*() %(*0' 2"' 5(*&' 3(*B0%5(#5' 3*#<*B' ' 0* ' J%"; %(#, <*%<: *() %(*%0' *: ' 3#0%&"' *(, *M: <#, 0*2%5; "(4* >' >&' 030*93*3; 5) -*() '*5; 00' <(*Y/: %4*+K1!D* >, : ' "*%BB' %03*(, *U, 0=*U' ""*%<: *&' *%; 3' 2; "*0' 3, ; 05' *2, 0*3' <#, 0*%<: *M; <#, 0*2%5; "(4* >' >&' 03-*&; (* 0' 20' 3) ' 03*%<: *3), 0(*U, 0=3), B3*()0, ; 6), ; (*() ' *4' %0*5, ;": *&' *%: : ' : 0*
- D) '*> %#<*#33; '*() %(*U'*%0'*2#<: #<6*U#()*+K1!D*#3*() %(*U'*%0'*<, (*6' ((#<6*J'04*>%<4*%BB"#5%<(30* C; 0*2#<: #<63*#<: #5%('*()%(*()'0'*3), ; ": *&'*%*)#6)'0*_; %<(#(4*, 2*+K1!D/(0%#<': *2%5; "(4*>'>&'03*(, * : 50'%3'*()'*&; 0: '<*, <*()'*2'U*U), *%0'*+K1!D/(0%#<': -*#<50'%3'*5, <3#3('<54*#<*0'B, 0(3-*%<: *(, * &'3(*%: J, 5%('*2, 0*%<:*3; BB, 0(*M; <#, 0*2%5; "(40*K(*#3*0'5, >>'<: ':*()%(*()'*10, J, 3(-*I'%<3-*%<:*.))%#03*>, 0'*3(0, <6"4*'<5, ; 0%6'*3'<#, 0*2%5; "(4*>'>&'03*

%

%

 $+*4A' < B^{**}$

&7/<7/1#B%

*I ' (' 0>#<' *#2*() ' *5; 00' <(*+K1!D*>, : ' "*%"#6<3*U#()*() ' *[<#J' 03#(4*%<: *<' 6, (#%(' : * 'SB'5(%(#, <3*G7C9H0**

D) ' *7 ' >, 0%<:; >*, 2*960' ' >' <(*G7, 9H*2, 0*() ' *+; >> ' 0*K<3(#(; (' *2, 0*1' ' 0*! J%"; %(#, <*, 2*D' %5))#<6* G+K1!DH*U%3*%BB0, J': *#<*VWXY*%<: *)%3*<, (*&''<*; B: %(': *3#<5'*()%(*(#>'0*.; 00'<("4-*()'*+K1!D*, &M 5(#J'3* 0' 2"' 5(*() , 3' *, ; ("#<' : *#<*() ' *7 , 90°D) ' *"' %0<#<6*, &M 5(#J' 3*: ' "#<' %(' : *#<*() ' *+K1! D*34""%&; 3*%0' *: #3(#<5(* %<: *>' %3; 0%&'' *%<: *() ' *>%(' 0#%"3*%<: *%5(#J#(#' 3*B0, J#: ' : *(, *+K1! D*B%0(#5#B%<(3-*0' 2"' 5(*() ' *+K1! D* B; 0B, 3'*(, *(' %5)*B%0(#5#B%<(3*), U*(, *B0' B%0' -*5, <: ; 5(*%<: *U0#(' *; B*B0, 2' 33#, <%"*B' ' 0/5"%330, , >* 'J%"; %(#, <30°D) ' *<%> ' 3*, 2*2%5; "(4*>' >&' 03*U) , *)%J' *5, >B"' (' : *() ' *+K1!D*(0%#<#<6*#3*, B' <"4*%J%#"%&"' * , <*()'*. Dal*U'&3#('*%(ℤ*)((B3Zqq3(, 5=(, <0': ; q5(": qB''0/, &3'0J%(#, </('%5)#<60)(>"0*K<5"; : ':*#<*()'* 5; 00' <(*+K1!D*>, : ' "#3*), >' U, 0=*(, *&' *5, >B"' (' : *&' 2, 0' *() ' *2#03(*+K1!D*: %4*%<: *), >' U, 0=*2, 0*' %5)* : %4-*%<: *B%0(#5#B%<(*0' 3B, <3#&#"#(#' 3*%0' *: #35; 33' : *%(*"' <6() *%(*() ' *' <: *, 2*() ' *() #0: *: %40*D) ' *. Dal *

I #0' 5(, 0*B' 0#, : #5%""4*0' _; ' 3(3*; B: %(' 3*20, >*+K1! D*(0%#<' : *B%0(#5#B%<(3*, <*() ' #0*B0, 60' 33*#<*>' (#<6*() ' #0*

D) ' *7 , 9*3) , ; ": *&' *0' J#' U' : *%<: *; B: %(' : *(, *0' 2"' 5(*5; 00' <(*(' 0>#<, ", 64-*: #0' 5(, 0*%<: *

L'J#'U*7C9*%<: *5;00'<(*+K1!D*>,: ' **34**%&;3*%<: *>%('0#%"3*,<*() ' *+K1!D*?*%5=&,%0:0*

0'3B, <3#&#"#(4*(, *5, >B"'('*2, ; 0*B''0*'J%"; %(#, <30**

0'3B, <3#&#"#(#'3-*2'"", U3-*

0°K: ' <(#24*3(0' <6() 3*%<: *U' %=<' 33' 3*, 2*() ' *5; 00' <(*>, : ' "*#<5"; : #<6*&' <' 2#(3*(, *+K1! D* B%0(#5#B%<(3-*#>B0, J' >' <(3*())%(*5, ; ": *&' *>%: ' -*%<: *6' <' 0%"*' SB' 0#' <5' 3*%3*B' ' 0*, &3' 0J' 030*

+*4A'<8%

9*3; 0J' 4*U%3*5, <: ; 5(' : *(, *%: : 0' 33*3' J' 0%"*2%5(, 03-*3, > ' *3B' 5#2#5*(, *() ' #0*+K1! D*' SB' 0#' <5' *%<: * , ()' 03*>, 0' *0' "' J%<(*(, *() ' *B' ' 0*' J%"; %(#, <*' SB' 0#' <5' 0*A%5(, 03*3B' 5#2#5*(, *+K1! D*U' 0' *, BB, 0(; <#(#' 3* B0, J#: ': *&4*+K1!D-*()'*J%"; '*, 2*+K1!D-*#>B%5(*, 2*3B' 5#2#5*+K1!D*%5(#J#(#' 3*, <*()'*_; %"#(4*, 2*B' '0* ' J%"; %(#, <30*A%5(, 03*0' "' J%<(*(, *() ' *B' ' 0*' J%"; %(#, <*' SB' 0#' <5' *U' 0' *3' "2/B' 05' #J' : *B' ' 0*' J%"; %(#, <* 3=#""3-*#>B%5(*, 2*B' ' 0*' J%"; %(#, <*, 2*B0, 2' 33#, <%"*: ' J' ", B>' <(-*%<: *0' %3, <3*2, 0*%55' B(#<6g0' 2; 3#<6*B' ' 0* 'J%"; %(#, <*0'_; '3(30*K<*%: : #(#, <-*() '*+K1!D*>, : ' "*)%3*5)%<6' : *3' J' 0%"*(#>'3*3#<5' *#(3*#<5' B(#, <*#<*VWXV-* %<: *3, *U' *U' 0' *B%0(#5; "%0"4*#<(' 0' 3(' : *#<*0' 3B, <3' 3*(, *() ' *5; 00' <(*>, : ' "-*U)#5)*)%3*&' ' <*#<*B"%5' *3#<5' * VWVWQ**

. *#234#B%

YV*+K1!D*B%0(#5#B%<(3*0'3B,<:':0*C<'*U%3*'S5";:':*20,>*%<%"43'3*:;'*(,*<,(*)%J#<6*5,>B"'(':* %*B''0*'J%"; %(#, <*%<: *#<: #5%(':*())%(*()'4*U'0'*%(*%*3(%6'*&'(U''<*()'*, &3'0J%(#, <*%<:*()'*U0#(('<* 0' B, 0(0*

>' ℚ*

*

+K1!D*U%3*%*J%"; %&"' *' SB' 0#' <5' *2, 0*

1		, 0,5		0.00/0(", <,			JU	
		1/1	ı.	D*I	10/ 2*	:0/×	10/1	

L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*R1"' %3' *	7,3(*	*F#6)*	7,:'0%('*	+>%""*	O, (*%(*
#<: #5%(' *4, ; 0*%60' ' >' <(*U#()*() ' *	. ' 0(%#<"4*	9>,;<(*	9>,;<(*	9>,;<(*	9""*
2, "", U#<6*6' <' 0%"*3(%(' >' <(3*%&, ; (*	A*GCH*	A*GCH*	A*GCH*	A*GCH*	A*GCH*
() ' *J%"; ' *, 2*+K1! D*2, 0*4, ; T*	VWVW/VY*C*	VWVW/VY*C*	VWVW/VY*	VWVW/VY*C*	
			C*		
+K1!D*#>B0, J':*()'*_;%"#(4*, 2*>4*B''0*	XW*GYVH*	XV*GYdH*	^GXdH*	VG^H*	XGYH*
, &3' 0J%(#, <30*	W^*] W*	XW*		

A%5(, 0*V0*+K1!D*o%"; ' *

L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*RF%3*5, <: ; 5(#<6*B' ' 0*, &3' 0J%(#, <3*)%: *

K [*] ' <n, 4<sup="">*: , #<6[*]()' >[*]</n,>	12 (39)*
K*U%<(*(, *&' *B%0(*, 2*%*(' %5)#<6*5, <j' 03%(#,="" <*<="" td=""><td>11 (35)</td></j'>	11 (35)

- 3; BB, 0(3[°]()^{-*}; 3[•], 2[°]B⁺ 0^{-*} J[%]; %(#, <3[°](, ^{*}3(0[°] <6()⁺ <^{*}(^{*}%5) #<6([°]D) #3[°] >%=^{*} 3[°]; 3[°]%⁻((^{*}00[°])
 K^{*})%J⁺2, ; <: *()%(^{*}3, >⁺ 2%5; "(4^{*}U #^{***}%3=^{*}V^{*}: #3(#<5(^{*}+K1!D^{*}(0%#<' : *2%5; "(4^{*}(, *, &3' 0J' *()) *+97!* 5, ; 03' *: ; 0#<6^{*}() '*+97!*3' >' 3(' 00[°]K^{*}(; 0<' : *, () ' 03^{*}%U%4^{*}U#(), ; (*=<, U#<6^{*}()%(^{*}U%3^{*}() '*5%3' 0[°]K^{*}
- +K1!D*#3*J'04*#>B,0(%<(*(,*2%5;"(4-*%<:*(,*+(,5=(,<-*#<*6'<'0%"0'D)'0'*#3*%*",(*,2*0'3'%05)*())%(* 3; BB,0(3*()'*;3'*,2*B''0*'J%";%(#,<3*(,*3(0'<6()'<*('%5)#<60*D)#3*>%='3*; 3*&'(('00*)

+*4A'<8%

*

#<*+K1! D*2, 0*() ' *B; 0B, 3' *, 2*#<50' %3#<6*+K1! D*B%0(#5#B%(#, <0*

[<:'03(%<:()'*B'03B'5(#J'*, 2*2%5;"(4*>'>&'03*U), *)%J'*<, (*B%0(#5#B%(':*#<*+K1!D* #<5"; : #<6*%0' %3*U) ' 0' *+K1!D*(0%#<#<6*#3*%: J%<(%6' , ; 3*, 0*5%<*: ' /' >B) %3#\$' -*0' %3, <3*2, 0*<, </B%0(#5#B%(#, <* $\mathsf{A\%5(, 0^{*}X0^{*}+'"2/1''05'"\#J'': *1'''0^{*}!'J\%''; \%(\#, <^{*}+=\#""3^{*}}$

L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*RF, U*: , *4, ; * 2' ' "*%&, ; (*4, ; 0*3=#"*%3*%*B' ' 0*, &3' 0J' 0*, 2* (' %5) #<6mT*	+(0, <6"4* 960' ' * A*GCH*	960' ' * A*GcH*	O'#()'0* 960''*<,0* I#3%60''* A*GCH*	I #3%60' ' * A*GCH* *	+(0, <6"4* #3%60' ' * A*GCH*
K*0%(' *>4*3=#""3*%3*%*B' ' 0*, &3' 0J' 0*%3*)#6)0*	3 (11)*	14 (52)*	7 (26)*	2 (7)*	1 (4)*
K*%>*5,<2#: '<(*()%(*K*5%<*' J%";%(' *%<: *3' "' 5(*		-	· · · · ·		

 $\underline{A\%5(, 0^{*}V0^{*}K\!>\!B\%5(^{*}, <^{*}10, 2^{*}33^{\#}, <\!\%^{**}: 'J'", B\!>'<\!(^{*}$

L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*RF%3*5, <: ; 5(#<6*B' ' 0*, &3' 0J%(#, <3*	7 %M, 0*	7,:'0%('*	7 #<, 0*
)%: *%<*#<2"; ' <5' *, <*() ' *2, "", U#<6*%3B' 5(3*, 2*4, ; 0*B0, 2' 33#, <%"*	K>B%5(*	K>B%5(*	K>B%5(*
: ' J' ", B>' <(mT*	A*GCH*	A*GCH*	A*GCH*
K*)%J'*5)%<6':*>4*"'%0<#<6*, &M 5(#J'3*#<*%(*"'%3(*, <'*5, ;03'0*	0 (0)*	7 (26)*	20 (74)*

I #35; 33*6' <' 0%"*(' %5)#<6*3(0%(' 6#' 3*2, 0*()#3*, 0*, () ' 0*5, ; 03' 30* I #35; 33*#<3(0; 5(, 0

*

19 (70)*

K<3(0; 5(, 0*; 3'*, 2*5, >B0')' <3#, <*5)' 5=3*				
G_; ' 3(#, <#<6-*%5(#J#(#' 3-*3' "2/%33' 33>' <(3H*, 0*				
, () ' 0*2, 0>%(#J' *%33' 33>' <(3*	11 (41)*	11 (41)*	1 (4)*	4 (15)*
+; 66' 3(#, <3*2, 0*#>B0, J' >' <(*, 0*%"(' 0<%(' *				
(' %5) #<6*>' () , : 3*	10 (37)*	12 (44)*	2 (7)*	3 (11)*
P' <' 0%"*%33' 33>' <(*, 2*U)' ()' 0*4, ; *U, ; ": *				
' <m, #<6*%*3(;="" '="" 4*&'="" :="" <(*#<*()#3*5"%33*<="" td=""><td>1 (4)*</td><td>5 (19)*</td><td>9 (33)*</td><td>12 (44)*</td></m,>	1 (4)*	5 (19)*	9 (33)*	12 (44)*
L'5, >>'<: %(#, <*(, *0' (%#<*, 0*B0, >, ('*())'*				
#<3(0; 5(, 0 [*]	1 (4)*	4 (15)*	5 (19)*	17 (63)*
*P' <' 0%"*5, >B%0#3, <*, 2*() ' *#<3(0; 5(, 0*(, *%<*				
#: ' %"*G' 060-*(, B-*%J' 0%6' -*B, , 0H*	1 (4)*	3 (11)		

 $\label{eq:started_st$

+*4A'<8%

*

9*3; 0J' 4*U%3*5, <: ; 5(' : *(, *%: : 0' 33*3' J' 0%"*2%5(, 03-*#<5"; : #<6*B' 05' B(#, <3*, 2*() ' *B' ' 0*' J%"; %(#, <* B0, 5' 33-*#<(' 0%5(#, <3*U#() *B' ' 0*, &3' 0J' 03-*%<: *3' "' 5(#<6*B' ' 0*, &3' 0J' 030*

L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*R1"' %3' *#<: #5%(' *4, ; 0*	960''*	O' #() ' 0*	I #3%60' ' *
"' J' "*, 2*%60' ' > ' <(*U#() *2, "", U#<6*3(%(' > ' <(3*%&, ; (*		960''gl #3%60''*	
4, ; 0*' SB' 0#' <5' *U#() *B' ' 0*, &3' 0J' 030T*			
D) ' *B' ' 0*, &3' 0J%(#, <*B0, 5' 33*) %3*#>B0, J' : *>4*	12		
(' %5)#<60*	(48)*	7 (28)*	6 (24)*
K*)%J' *%BB"#' : *3; 66' 3(#, <3*&4*, &3' 0J' 03*2, 0*	19		
#>B0, J' >' <(3*, 0*%"(' 0<%(' *(' %5) #<6*>' () , : 3*	(76)*	3 (12)*	3 (12)*
1' ' 0*, &3' 0J%(#, <3*)%J' *%: ' _; %(' "4*#: ' <(#2#' : *>4*	17		
(' %5)#<6*3(0' <6()3*%<: *U' %=<' 33' 3*	(68)*	5 (20)*	3 (12)*
D) ' *B' ' 0*, &3' 0J%(#, <*0' B, 0(3*#<*>4*2#"' *%0' *>%M, 0*			
#<2"; ' <5' 3*#<*0' (' <(#, <-*(' <; 0' *%<: *B0, > , (#, <*			
: ' 5#3#, <3*2, 0*>' *G' 060-*0' 2' 0' <5' : *#<*"' ((' 03*20, >*1L*	10		
AL*, 0*I ' % <h*< td=""><td>(40)*</td><td>13 (52)*</td><td>2 (8)*</td></h*<>	(40)*	13 (52)*	2 (8)*

 $\frac{A\%5(, 03^{*}X^{*}e^{*}YI^{*}1, 05' B(\#, <3^{*}, 2^{*}1', 0^{*}! J\%')}{AW5(, 0^{*}YI^{*}, 0^{*})} \%(\#, <^{*}B0, 5' 33^{*})$

Α*
X*
V*
VX*
X*

K*%>*; <5' 0(%#<*%&, ; (*() ' *%&#"#(4*, 2*, &3' 0J' 03*U) , *%0' *			
<, (*#<*>4*2#' ": *(, *' 22' 5(#J' "4*' J%"; %(' *>4*(' %5)#<6*			
>' () , : 3*	7 (28)*	4 (16)*	14 (56)*
K*%>*; <5' 0(%#<*%&, ; (*() ' *%&#"#(4*, 2*, &3' 0J' 03*U) , *%0' *</td><td></td><td></td><td></td></tr></tbody></table>			

5, <(' <(*#<*>4*5"%33' 3*

(, *#<5"; : ' *#<*4, ; 0*B' 03, <<' "*

 $\mathsf{A\%5(, 0^*]0^*\!K<('\ 0\%5(\#,\ <3^*\cup \#()\ ^*1'\ '\ 0^*!\ \mathsf{J\%''};\ \%(,\ 0^*92('\ 0^*C\&3'\ \mathsf{0}\,\mathsf{J\%(\#,\ <^*+'\ 33\#,\ <0^*)})}$

L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*R92(' 0*() ' * 5"%33*, &3' 0J%(#, <*), U*20' _; ' <("4*)%J'* 4, ; *%<: *4, ; 0*, &3' 0J' 0G3H*' <6%6' : *#<*() ' * 2, "", U#<6m

*

L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*R8)%(*0' %3, <3*)%J' *4, ; *&' ' <*6#J' <*U) ' <*	A*GCH*
3, >' , <' *: ' <#' : *4, ; 0*0' _; ' 3(*2, 0*B' ' 0*, &3' 0J%(#, <m*+' "'="" 5(*%""*()%(*%bb"4t*<="" td=""><td><*k*XV*</td></m*+'>	<*k*XV*
D) ' 4*#6<, 0' : *, 0*: #: *<, (*0' 3B, <: *(, *>4*0' _; ' 3(*	7 (58)*
E; 3(*2"%(*, ; (-*q<, q-*<, *0' %3, <*6#J' <*	1 (8)*
+5)':;"#<6*5,<2"#5(3*	10 (83)*
a%5=*, 2*(#>'	

L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*R! 3(#>%(' *) , U*>%<4*B' , B"' *	A*GCH*<*K*XV*
)%J' *<, (*%60' ' : *(, *&' *%*B' ' 0*, &3' 0J' 0*2, 0*4, ; *U) ' <*%3=' : *	
G' S5"; : ' *0' _; ' 3(3*4, ; *)%J' *U#() : 0%U <h0t*< td=""><td></td></h0t*<>	
X/V*	0 (0)*
$Y/$ *	8 (69)*
]/^*	1 (8)*
f/b*	2 (15)*
d/XW*	1 (8)*
XX/X]*	0 (0)*
X^*/*VW*	0 (0)*
VX*, 0*>, 0' *	0 (0)*

$A_{N,3}(, 0) = 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0$	
L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*RF%3*%<4, <' *' J' 0*: ' <#' :*	A*GCH*
4,;0*0'_;'3(*2,0*%*B''0*,&3'0J%(#, <mt*< td=""><td></td></mt*<>	
' 3*	XV*G\bll*
0,*	XY*G]VH*
*	

L 10, 60% >* * A%5(, 0*f0*C&3(%5"' 3*(, *2#<: #<6*B' ' 0*' J%"; %(, 03**

L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*RF, U*: , *4, ; *5) , , 3' *%*B' ' 0*, &3' 0J' 0*6, 0*	
5),,3'*B',B"'*(,*%3=*(,*&'*%*B''0*,&3'0J'0Hm*+'"'5(*%""*()%(*%BB"4T*	F (%)
K^* 3=*, () ' 0*2%5; "(4*(, *0' 5, >>' <: *	15(19)*
K*5),,3' *B0' J#,;3*+K1!D*B%0(#5#B%<(3*	14(18)*
K*&0#<6*<%>'3*, 2*B, ('<(#%"*, &3'0J'03*(, *>4*I'%<-*%<:*()'<*()'*I'%<*	
%BB0, J' 3*	7(9)*
K*%3=*B' , B"' *U) , *)%J' *0' B; (%(#, <3*%3*60' %(*(' %5) ' 03*	8(10)*
$ \begin{array}{c} \mathbb{K}^{**} > \% \#^{**}, \ 0^{*} 5\%^{**} ()^{**}. \ \text{Dal } g @ \% () \ 4^{*} @^{**} \ \# <^{*} U \# ()^{*} \%^{*} 0^{*} \ _; \ ^{*} 3(^{*} 2, \ 0^{*} 0^{*} \ 5, \ > >^{*} <: \ \% (\#, < 3^{*}) \ \% () \ \# ()^{*} \%^{*} 0^{*} \ _; \ ^{*} 3(^{*} 2, \ 0^{*} 0^{*} \ 5, \ > >^{*} <: \ \% (\#, < 3^{*}) \ \% ()^{*} \ \% ()^{*} \ \% ()^{*} \ \clubsuit ()^{*} \ \% ()^{*} \$	4(5)*
74*.)%約*0'5, >>'<:3*	5(6)*
K*%3=*2%5; "(4*K*=<, U*, 0*)%J'*)'%0:*, 2*	14(18)*
Kn""*(%=' *%<4, <' *U), *%60' ' 3*(, *: , *#(p*	9(11)*
D)'4*%0'*5), 3'<*2, 0*>'*&4*>4*1'%<-*.)%#0-*, 0*3'<#, 0*>'>&'03*, 2*>4*	
10, 60% >*	3(4)*

- D) %<=*4, ; *2, 0*: , #<6*() #3*3; 0J' 40*9"(), ; 6) *K*() #<=*B' '0*, &3' 0J%(#, <3*5%<*&' *) ' "B2; "-*() '0' *%0' *
 >%<4*&%00#' 03*(, *<, (' Z*XH*o' 04*3(0' 332; "*2, 0*() ' *2%5; "(4*>' >&' 0-*U), *#<*%: : #(#, <*(, *KI !9* ' J%"; %(#, <3*' %5) *3' > '3(' 0-*B0' 5' B(#<6*' J%"; %(#, <3-*1L. *"' ((' 03-*%"3, *) %3*(, *) %J' *XW*B' '0*
- 9*B, , 0*, &3' 0J%(#, <*5, ; ": *&' *; 3' : *%6%#<3(*>'*' J' <*#2*#(n3*<, (*3; &>#((' : *#<*>4*2#" 0**
 1' ' 0*, &3' 0J%(#, <3*%0' *%' J#(%"*%3B' 5(*, 2*(' <; 0' 0*D) ' 4*) ' "B*(, *5, >B"#>' <(*3(; : ' <(*' J%"; %(#, <3*3, *)))))
- : ' "#J' 0' : *: ; 0#<6*() , 3' *3B' 5#2#5*"' 5(; 0' 30*K*2#<: *() ' #0*' SB' 0#' <5' *#<J%"; %&"' 0*
- 3(0' 332; "*&' 5%; 3' *; 3; %""4-*() ' *, &3' 0J' 03*: , *< , (*0' 3B, <: *U#() *%<*%<3U' 00*** • D) ' *1L. *3) , ; ": *J%"; ' *%<: *5, <3#: ' 0*B' ' 0*' J%"; %(#, <3*>, 0' 0*1' ' 0*' J%"; %(#, <3*%0' *%*>; 5) *> , 0' * %BB0, B0#%(' *> ' () , : *2, 0*: #35; 33#<6*(' %5)#<6*' 22' 5(#J' <' 33*6%3*, BB, 3' : *(, *3(; : ' <(*' J%"; %(#, <3*, 0* 5. · 03' *>%(' 0#%"3H0%'() #<=*B' ' 0*' J%": %(# <3*3) ...** *&' *5. <3#: ' 0' · *%<**U! #6) (' · *' ...**"4"(...*() ' *
- , &3' 0J%(#, <3*B' 0*4' %0-*&; (*)%J' *&' ' <*>' (*U#()*, J' 0*XW*#<: #J#: ; %"3*: ' 5"#<#<6*>4*0' _; ' 3(0*K*; ; <: ' 03(%<: *() ' #0*0' %3, <#<6-*&; (*#2*' %5)*, 2*() ' *ODD1*2#'' 3*0' _; #0' *V*B' ' 0*, &3' 0J%(#, <3*B' 0*4' %0-* () ' <*() ' *"#3(*, 2*%BB0, J' : *, &3' 0J' 03*<' ' : 3*(, *>; "(#B*4*' SB, <' <(#%""40*
 A, 0*(U, *0' %3, <3-*K*3; 66' 3(*, <' *B' ' 0*' J%"; %(#, <*B' 0*4' %00*XH*%BB*4#<6*() ' *0' 5, >>' <: %(#, <3*#<* () ' *B' ' 0*' J%"; %(#, <*<' ' : 3*>, 0' *() %
- K*%BB0' 5#%('*() #3*3; 0J' 40*D) #3*#3*%*3(0' 332; "*B#' 5' *(, *5, >B"' ('*2, 0*() '*2#"'*0' J#' U*%3*%*0' "%(#J' "4*
 (U*' >B", 4' '*%(*+(, 5=(, <0**K*)%J'*2, "", U' : *%""*() '*8: J#5' *B0, J#: ':*(, *3' 5; 0' *V*B' ' 0**
- , &3' 0J' : 0*K*2' ' "*"#=' *Kn>*&' 66#<6*B' , B"' *2, 0*) ' "Bp*K(3*4; 5=40*
 ! O! LI *B' ' 0*0' J#' U*B' 02, 0>' : *)%3*(%=' <*3' J' 0%"*>, <() 3*2, 0*>' *(, *0' 5' #J' *%*0' B, 0(*, <0*O! O! L*)%J' *%<4*, 2*() ' *0' J#' U' 03*' SB0' 33' : *%<*#<5"#<%(#, <*, 0*0' _; ' 3(*(, *q: #35; 33q*() ' #0*, &3' 0J%(#, <3*)))
- D) '*' SB' 5(%(#, <*, 2*D! O*B' '0*, &3' 0J%(#, <3*2, 0*() '*(' <; 0' *2#'' *#3*' S5' 33#J' *%<: *<, (*) '"B2; "0*K*5% > '*) '0' *20, >*%<, () '0*#<3(#(; (#, <*()%(*0' _; #0' : *X*&' 2, 0'*() '*Y0: *4' %0*0' J#' U*%<: *X*&' 2, 0'*() '*2#J' /4' %0*1r D*B%5=%6' *U%3*3; &>#((':0*1'0)%B3*()%(n3*<, (*' <, ; 6)*2, 0*%<*#<3(#(; (#, <*()%(*' >B)%3#\$' 3* (*%5)#<6*&; (*') '0' *)%3*(, *&' *% > #:: ''*60, ; <:0*7%4&' *V*&444' %0*()0' '-*V*&444' %0*2#J' m**K*%3, *()#<=* () '*' J%"*B0, 5' 33*#(3' '2*5, ; ": *&' *(#6) (' <': *; B*%*&#(0*1'0)%B3*3(%0(*U#()*%3' '2/0' 2"' 5(#, <*()%(*' ')*3)% *() **
 ('*' J%"*B0, 5' 33*#(3' '2*5, ; ": *&' *(#6) (' <': *; B*%*&#(0*1'0)%B3*3(%0(*U#()*%3' '2/0' 2"' 5(#, <*()%(*' ')*3)% *() **
 ('*' J%"*B0, 5' 33*#(3' '2*5, ; ": *&' *(#6) (' <': *; B*%*&#(0*1'0)%B3*3(%0(*U#()*%3' '2/0' 2"' 5(#, <*()%(*' ')*3)% *() **
 ('*' J%"*B0, 5' 33*#(3' '2*5, ; ": *&' *(#6) (' <': *; B*%*&#(0*1'0)%B3*3(%0(*U#()*%3' '2/0' 2"' 5(#, <*()%(*' ')*3)% *() **
 ('*' J%"*B0, 5' 33*#(3' '2*5, ; ": *&' *(#6) (' <': *; B*%*&#(0*1'0)%B3*3(%0(*U#()*%3' '2/0' 2"' 5(#, <*()%(*' ')*3)% *() **
 ('*' J%"*B0, 5' 33*#(3' '2*5, ; ": *&' *(#6) (' <': *; B*%*&#(0*1'0)%B3*3(%0(*U#()**3)' 2/0' 2"' 5(#, <*()%(*' ')*3)% *() **
 ('*' J%"*B0, 5' 33*#(3' '2*5, ; ": *&' *(#6) (' <': *; B*%*&#(0*1'0)%B3*3(%0(*U#()**3)' 2/0' 2"' 5(#, <*()%(*' ')*3)) *() **
 ('*' J%"*B0, 5' 33*#(3' '2*5, ; ": *&' *(#6) (' <': *; B*%*&#(0*1'0)%B3*3(%0(*U#()**3)' 2/0' 2"' 5(#, <*()%(*' ')*3)) *() **
 ('*' J%"*B0, 5' 33*#3' 5(3*, 2*(' %5) #<6*() *() **
 ('*' J%"*B0, 5' 33*#3' 5(3*, 2*(' %5) #
 ('*' J%"*D%
 ('*' J%"*B0, 5' 33*#3' (, *
 ('*' J%"*B0, 5' 33*#3' (, *
- $\underline{N}; \\ & \underline{N}; \\ & \underline{N$

B, U' 0': #22' 0' <(#%"'(, *(%=' *#<(, *5, <3#: '0%(#, <*U)' <*%*; <(' <; 0' : *B' 03, <*)%3*(, *%3=H'YH*A%5; "(4* >' >&' 03*%0'*; <5"' %0*, 0')%J'*: #22' 0' <(*, B#<#, <3*0' 6%0: #<6*%*B' '0*, &3' 0J%(#, <*U)#5)*5%; 3' 3* 5, <2; 3#, <0**A, 0*' S% >B"' -*3, > '2%5; "(4*3%4*, <"4*; 3'*(), 3'*U), *%0'*(0%#<': -*3, > '3%4*, <"4*; 3'*%* 2%5; "(4* >' >&' 0*#<*4, ; 0*B0, 60% > -*3, > '3%4*, <"4*; 3'*(), 3'*, ; (3#: '4, ; 0*B0, 60% > -*' (50**D)' 0'*#3* <, *5, <3#3(' <54*%<: '()'*%5=*, 2*5"%0#(4*%:: 3*(, '()'*3(0' 332; "<' 33*6%<: '()'*5, <5' 0<##3*:, #<6* 3, > '()#<6*: #22' 0' <(*()%<*U)%(*#3*0' 5, >> ' <: ':*5%<*); 0(*4, ; 0*B0, >, (#, <*6' S% >B"' -*, <' 2%5; "(4* 3%43*; 3'*, <"4*(0%#<' :*, &3' 0J' 03*%<: *%<, ()' 0*3%43*#(*:, '3<n(* >%((' 0*%<: *6, #<6*%6%#<3(*, <' *, 2*())** 0' 5, >> ' <: ':*5%<*); 0(*4, ; 0*B0, >, (#, <*6' S% >B"' -*, <' 2%5; "(4* 3%43*; 3'*, <"4*(0%#<' :*, &3' 0J' 03*%<: *%<, ()' 0*3%43*#(*:, '3<n(* >%((' 0*%<: *6, #<6*%6%#<3(*, <' *, 2*())** 0' 5, >> ' <: '()** 0' 5, >> ' <: %(#, <3*U#m*& '*; 3': *%6%#<3(*4, ; H'\HK')%J' *<' J' 0*0' 5' #J' :*%B' 0*, &3' 0J%(#, <*8%5=* U#()#<(')'*V*U' =: ': %: "#<' 0*7 , 3(*, 2*()' *#(*#3*>, <() 3*"%((*U))#5) > ' %<3*#2*#(*U%3*% 5, <5' 0<#<6*0' B, 0(-*K*:, *<, (*)%J' *(# > '*(*#3*), <() 0**K(*#3*; <5, >2, 0(%&"'*(, *%3=*2, 0*#(*3#<5'* ()'*B' 03, <*U), *: #: '()'*, &3' 0J%(#, <*n)%3'()'*B, U' 00*K(*#3*; <5, >> '<: %(#, <3, >', <' *#3* 0' 3B, <3#&"'*2, 0* >%=#<6*3; 0'*#(*#3*0' 5', #J' :*U#()#<'()'*(#>'*20%>'*GI '%<-5')%#0.*'(50H*

0' 3B, <3#&"' *2, 0* >%=#<6*3; 0' *#(*#3*0' 5' #J' : *U#()#<*()'*(#> ' *20%>' *GI ' %<-*5) %#0-*' (50H* D) ' *"%06' 3(*0' %3, <*K*)%: *2, 0*3, *>%<4*B' ' 0*0' J#' U*0' _; ' 3(3*&' #<6*: ' <#' : *2, 0*"%5=*, 2*(#> ' *U%3*()%(* K*%3=' : *20, >*() ' *"#3(3*B; &"#3)' : *, <*() ' *. Dal *B%6' *, 2*() ' *[<#J' 03#(4*U' &3#(' 0*K(*3' ' > 3*()%(* ' J' 04, <' *5, <(%5(3*B', B"' *20, >*() ' *(, B*, 2*() ' *"#3(*2#03(0**8))' <*K*2#<%"' 4*0' %"#\$' : *() %(*%<: *U, 0=' : * 20, >*", U*, <*() ' *"#3(-*K*0' 5' #J' : *>; "(#B"' *, 22' 030**D) #3*3), ; ": *&' *5, <3#: ' 0' : *#<*), U*() %(*"#3(*#3* B; &"#3)' : *, <*() ' *U' &*B%6' 0q*

+K1!D*DA*L'B, 0(-**YW*

 $\label{eq:started_st$

A%5(, 0*X0*L' %3, <3*2, 0*<, (*B%0(#5#B%(#<6*#<*+K1!D0*

*

L' 3B, <3' 3*(, *() ' *_; ' 3(#, <-*R1"' %3' *) ' "B*; 3*; <: ' 03(%<: *4, ; 0*0' %3, <3*2, 0*	A*GCH*
<pre><, (*)%J#<6*B%0(#5#B%(': *#<*+(, 5=(, <*K<3(#(; (' *2, 0*1' ' 0*! J%"; %(#, <*, 2*</pre>	
D' %5)#<6*G+K1!DH0*+' "' 5(*%""*()%(*%BB"4T*	
K*: , *<, (*)%J' *(#>' *(, *: , *() ' *(0%#<#<6*	12 (44)*
K*5%<<, (*5, >'*(, *5%>B; 3*2, 0*()'*(0%#<#<6*	4 (15)*
K*B [*] %<*(, *B%0(#5#B%(' *#<*+K1!D*3, >' (#> ' *#<*() ' *<' S(*2' U*4' %03*	8 (30)*
K*: , *<, (*U%<(*(, *: , *%*+(, 5=(, <*3; >> ' 0*#<3(#(; (' *	6 (22)*
K*2' ' "*(0%#<#<6*#3*<, (*<' 5' 33%04*2, 0*>' *	6 (22)*
D) ' *%BB"#5%(#, <*(#>#<6*#3*#<5, <j' <#'="" <(*<="" td=""><td>3 (11)*</td></j'>	3 (11)*
K*<' ' : *> , 0' *0' >#<: ' 03*%&, ; (*() ' *%BB"#5%(#, <*: ' %: "#<' *	2 (7)*
D) ' *%BB"#5%(#, <*B0, 5' 33*#3*5; >&' 03, >' *	4 (15)*
D) ' *B%4*#3*<, (*0' %3, <%&"' *	4 (15)*
[K*)%J'*&''<*(0%#<':*(,*:,*B''0*'J%";%(#,<3-*'"3'U)'0'*	3 (11)*
K*: #: *<, (*=<, U*+K1!D*' S#3(' : *	2 (7)*

K*%>*;<2%>#'#%0*U#()*#(3*B;0B,3'

A%5(, 0*V0*D#>#<6*, 2*+K1!D*

*	+K1!D*1%0(#5#B%<(3*	O, *+K1!D*</th
	K<*0'3B, <3'*(,*()'*_;'3(#, <-*	K<*0' 3B, <3' *(, *() ' *_; ' 3(#, <-*
	P#J' <*4, ; 0*' SB' 0#' <5' *U#()*	RK2*6#J' <*%*5), #5' -*U)' <*U, ; ": *
	+K1!D*#<*()'*3; >>'0-*U)'<*:,*	#(*&' *5, <j' *="" <#'="" <(*%<:="">, 3(*</j'>
	4,;*2''"#3*()'*#:'%"*(#>'*+K1!D*	&' <' 2#5#%"*2, 0*4, ; *(, *
	3),;":*&'*,22'0':*2,0*>%S#>%"*	B%0(#5#B%(' *#<*+(, 5=(, <*
	' <6%6' >' <(*901 *&' <' 2#(*(, *	K<3(#(; (' *2, 0*1' ' 0*! J%"; %(#, <*, 2*
	B%0(#5#B%<(3mT*	D' %5)#<6*G+K1!DHmT*
	A*GCH*	A*GCH*
A%""*+' >' 3(' 0*	X*GYH*	V*GFH*
+B0#<6*+' >' 3(' 0*	W*	X*G\H*
D)0, ; 6), ; (*() ' *%5%: ' >#5*4' %0*	Y*GXWH*	b*GYWH*
+; >>' 0-*&' 2, 0' *E; <' *YW*	VY*Gf\H*	b*GYWH*
+; >>' 0-*%2(' 0*E; <' *YW*	∖*GXYH*	X*G\H*
O, <' -*K*%>*<, (*#<(' 0' 3(' : *#<*+K1!D*	Og9*	f*GV^H*
(0%#<#<60*		

*

*

&')2#B%

+*4A'<8%

- %D0%#<#<6*B0%5(#5'3*,2*,()'0*35),,"3M%
- D) ' *2, "", U#<6*U' 0' *() ' *: #0' 5(#J' 3*6#J' <*(, *%*3; &/60, ; B*, 2*() ' *(%3=*2, 05' Z*

L'J#'U*>,:'"3*,2*Y*/*]*,()'0*35),,"3*G#<5";:'*5,>B%0%&"'*#<3(#(;(#,<3H-*5,>B%0'*(,*+K1!D*>,:'"0*

F, U*: , *, () ' 0*35), , "3*(0%#<*B' ' 0*' J%"; %(, 03m*

+(0' <6() 3^* , 2^* , () ' 0^* >, : ' " 3^* 8' %=<' 33' 3*, 2*, () ' 0*>, : ' "3*

. *)', , */<"47'/#B%