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	#"!!\$%&' ()*+, -!!"	
	\$"!!/*01), %, &1!23)+&3+)1!4, !351!2&5**6!*7!8+94&!""""""""""""""""""""""""""""""""""""	
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	#"!!2&5**6!*7!8+94&!>1()11!B)*()%C9!!!"	
	\$"!!8+94&!: 1)3474&%319!!!""!!=!	
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	#"II#_0494 (184994* 123%31C1 3111"""""""""""""""""""""""""""""""	
	#"!!#-0494, (!84994*, !23%31C1, 3!!!""""""""""""""""""""""""""""""""""	
	: "!!8464' 4, !F, 401)943G!>174, 434*, !*7!#&%-1C4&!#-0494, (!!"""""""""""""""""""""""""""""""""""	
	>"!!?*619!4, !#-0494, (!!"""""""""""""""""""""""""""""""""""	
	I "!!: 5%, (1!*7!J%&+63G!#-049*)!!"	
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\$"!!#&&*C@%, 493!J119!!""""!!!"!!!!!!!!!!!!!!!!!!!!!!!!!	
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O"!\$17*)1!`*+!: *, 3%&3!%, !#&&*⊂@%, 493!!!""""""""""""""""""""""""""""""""""	
. "!?151%)94, (!\435!`*+)!#&&*C@%, 493!!"""""""""""""""""""""""""""""""""""	
="!a%31, 199!%, -!: %, &16%34*, !*7!?151%)9%69!*)!a199*, 9!!"""""""""""""""""""""""""""""""""""	

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"!!J4, %%! T%C!2&51-+64, (!bB*64&419!c!B)*&1-+)19!H"Hd!!!"""""""""""""""""""""""	!HOI!
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\$"!!?1C%4, 4, (!2; 8!: *, &1)39R!; 77!: %C@+9!B1)7*)C%, &19WV*+)9R!%, -!2@1&4%6!101, 39". Z

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! ! *7!*)4(4, %(!*)'9"!!61&3401!&*+)919!7*)!3549!&1)3474&%31!%)1!@)4C%)46G!351*)GW%, %6G949!&6%9919!

Į. 93+-1, 3!@)*()199"!!#!93+-1, 3n9!7%4+)1!3*!@%99!*, 1!*)!C*)1!*7!35191!\466!A1!&*, 94-1)1-! Ţ %-1K+%31!104-1, &1!3*!)1K+4)1!%!&5%, (1!*7!@)*()%C"!!; 7!@%)34&+6%)!4C@*)3%, &1!%)1!351! I. 9*@5*C*)1!A%))41)9!4, !@1)7*)C%, &1!X911!A16*\Y"!!V51!@+)@*91!*7!3549!1T%C4, %34*, !49!3*! Ţ %99199!351!93+-1, 3l9!@*31, 34%!7*)!%!&%)11)!%9!%!@1)7*)C4, (!C+94&4%, "!!23+-1, 39!10%+%31-!3*! 5%01!C%−1!4, 9+774&41, 3!@)*()199!∖4&!, *3!A1!%&*∖1−!3*!&*, 34, +1!4, !%!@1)7*)C%, &1!@)*()%C"!! Т ļ [,!(1,1)%R!351!)19+639!*7!%!9*@5*C*)1!A%))41)!C%G!A1!%9!7*66*∖9i! 0"!!B%991-! L ļ Į. Į. . "!!J%461-!\435!351!*@34*, !*7!)1^%+-434*, 4, (!! Ţ Į. ="!!J%461-!\435!, *!*@34*, !7*)!)1^%+-434*, 4, ("! Ţ. Ţ

f 51)1%9!%!8464' 4, !1-+&%34*, !49!351!@)1@%)%34*, !7*)!@)*71994*, %!9+&&199R!-1C*&)%34&! &434<1,954@R!%,-!%!@1)9*,%6471!*7!C1%,4,(!%,-!0%+1R!%-0494,(!49!&1,3)%63*!-16401)4,(!351! 1-+&%34*, !C4994*, !*7!8464'4, !F, 401)943G"!#-0494, (!49!A*35i!

- Į. k!%!&*66%A*)%3401!9G931C!95%)1-!AG!93+-1, 39R!7%&+63GR!%-C4, 493)%34*, !%, -!93%77!%33+, 1-!
- 3*!-1@%)3C1, 3%%!, 11-9!7*)!@)*71994*, %%!-1016*@C1, 3!%, -R! İ.
- k!%, !*, (*4, (!@)*&199!*7!1T@6*)%34*, R!-49&*01)GR!)1761&34*, !%, -!()*\35"!#9!9+&5R! İ.
- Į. %-0494, (!%--9!3*!%!8464'4, !1-+&%34*, , (&)], (&)]%!&1(,)*(1)-1-1(*,)1(%3)2(*!)-100. 2412. 0189590.

 $\begin{array}{l} V51!\%-049^*)!95^*+6-!516@!351!93+-1,3!4,31)@)13!>1@\%)3C1,3\%R!:*661(1!\%,-!F,401)943G!\\)1K+4)1C1,39!\%9!-19&)4A1-!4,!351!$+66134,"!![3!49!351!)19@*,94A4643G!*7!351!93+-1,3!3*!911'!*+3!351!\%-049^*)!4,!%!34C16G!7\%954^*,R!@)*04-1!4,7^*)C\%34^*,!*,!@1)9^*,\%8!\%,-!\%8\%-1C4&!499+19!\\)1610\%,3!3*!351!93+-1,3^{\%}-049^*)!4,31)\%&34^*,!\%,-!3^*!A1!7\%C464\%)!`\435!\%@@)*@)4\%31!91&34^*,9!*7!351!\\ F,401)943G!$+66134,!B*64&419!\%,-!B)*&1-+)19!7^*)!J\%&+63G"!!#-049^*)9!5\%01!%&&199!3*!-1()11!\\ 10\%+%34^*,9!7^*)!93+-1,39!\%994(,1-!3^*!351C!04\%!8F!*,64,1"!!!$

#&%-1C4&!%-0494, (!49!%!@)*%&3401R!*, ^(*4, (!)16%34*, 954@!35%3!@%4)9!(+4-1-!-49&*01)G!\435! 4, 31, 34*, %6!93)%31(4&!@6%, , 4, (!3*!)19+63!4, !1, 5%, &1-!@1)94931, &1R!&*, , 1&34*, !3*!%@@)*@)4%31! &%C@+9!%, -!&*CC+, 43G!)19*+)&19R!%, -!-1016*@C1, 3!*7!&%)11)!(*%69"!

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 $\begin{array}{l} k!8\%4, 3\%4, !\%, !*, (*4, (!)\%@@*)3! \ 435!351!\%994(, 1-!\%-049*)R!3*!4, &6+-1!)1(+6\%)! \\ \&^{*}CC+, 4&\%34^{*}, ! \\ k!e, * \ 1351!+, 401)943GR!&*601(1R!\%, -!C\%_*)!)1K+4)1C1, 39!*7!351!&5*91, !7416-X9Y!*7! \\ 93+-G! \\ k!$1!@)*\%&3401!4, !\%-0494, (!C1134, (9"!B)191, 3!9@1&474&!K+1934^{*}, 9R!@)1@%)1!7^{*})!&6\%99! \\ 9&51-+64, (!91994^{*}, 9!AG!&)1\%34, (!\%!31, 3\%3401!9&51-+61R!\%, -!C^{*}, 43^{*})!* \ !@)^{*}()199R! \\ '11@4, (!4, !C4, -!351!)1K+4)1C1, 39R!@6\%, !*7!93+-G!\%, -!&\%)11)!(*\%69! \\ k!B%)34&4@\%31!4, !)1(+6\%)!9167^{1761}&34^{*}, !)1(\%)-4, (!@1)9^{*}, \%6!\%, -!\%&\%-1C4&!()^{*}35R!\%, -! \\ 3\%'1!\%-0\%, 3\%(1!*7!+, 401)943G!)19^{*}+)&19!A1G^{*}, -!351!7\%&+63G!\%-049^{*})!X4, &6+-4, (! \\ 21&^{*}, -\%)G!23+-1, 3!>1016^{*}@C1, 3!#-049^{*})9R!23+-1, 3!2+&&199!: 1, 31)R!f)434, (!:1, 31)R! \\ 8\%35!:1, 31)R!3+3^{*}4, (!91)04&19R!Q1\%635!: 64, 4&R!: *+, 9164, (!21)04&19R!13&"Y! \\ 1\end{array}$

! V51!2&5**6!*7!8+94&!7%&+636!%()119!3*!9+9@1, -!%6!&6%9919R!6199*, 9R!%, -!)151%)9%69! ! A13\11, !M%C!%, -!=@C!*, !2&51-+64, (!>%G!1%&5!91C1931)"!

! #!&5%, (1!*7!7%&+63G!%-049*)!C%G!A1!4, 434%31-!AG!14351)!351!%-049*)!*)!351!93+-1, 3!A+3!C+93! ! A1 (4, !\435!&*, 9+63%34*, !A13\11, !351!3*"!B1)C4994*, !*7!351!>4)1&3*)!\466!A1!()%, 31-!\51, ! ! 351!, 1\!%, -!*6-!%-049*)9!%, -!351!93+-1, 3!5%01!A11, !4, 7*)C1-!%, -!%()11!3*!351!&5%, (1"!! ! V51!93+-1, 3!C+93!7*)C%64<1!%, G!&5%, (1!*7!%-049*)!AG!7464, (!*+3!351!>186%)%34*, !*)!: 5%, (1!*7! *!* 8%_*)*!%*, -*W**)*!*84, *)*!*, *J**)*C*!X7)*C!?1(493)%)𝔊9!; 774&1Y!%, -!)13+), 4, (!43!3*!351!?1(493)%)I9!; 774&1! ! \435!351!%@@)*@)4%31!94(, %3+)19"!

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#+-43!%, -!91K+1, &1!951139!7*)!%6!-1()11!@)*()%C9!&+))1, 36G!*771)1-!4, !351!2&5**6!*7!8+94&! &%, !A1!7*+, -!4, !351!2; 8!*774&1!%, -!*, 64, 1"!! Į. k!V51!%+-43!95113!@)191, 39!C+94&!-1()11!@)*()%C9!4, !3514)!&+))4&+6%)!9+A9139!\5461! @)*04-4, (!351!C1%, 9!3*!)1&*)-!&*+)91!1,)*6C1, 3!3*!C113!-1()11!)1K+4)1C1, 39"!V51! Į. Į. %-049*)!%, -!351!93+-1, 3!95*+6-!1%&5!C%4, 3%4, !%, !+@^3*^-%31!&*@G!*7!3549!95113!7*)! Į. 3514)!)1&*)-9"! k!V51!91K+1, &1!95113!@)191, 39!%!)1&*CC1, -1-!34C164, 1!7*)!1,)*66C1, 3!4, !&*+)919!! I. 7*)!1%&5!-1()11!@)*()%C"!V549!)1&*CC1, -1-!91K+1, &1!91)019!9101)%!@+)@*919R!! Į. ļ 4, &6+-4, (i! o %0*4-4, (!*01)6*%-!7119m! ○ %@@)*@)4%316G!91K+1, &4, (!&*+)919!\435!@)1)1K+494319m! ○ 4-1, 347G4, (!&*+)919!*771)1-!*, 6G!4, !351!7%66!*)!9@)4, (!31)C"! İ

 $\begin{array}{l} \mathsf{F}_{,-1}()\% - +\%31!93 + -1, 39!\%)1!)1\mathsf{K}_{,4}1 - !3*!\mathsf{C}113! \land 435!3514)!\% - 049^{*})!\%, -! \land *')^{*}! * + 3!\%!@\%, !*7!93 + -G! \\ 7^{*})!351!\&^{*}\mathsf{C4}_{,}(!31)\mathsf{C}! - +)4, (!1\%)6G!?1(493)\%34^{*}, "!V51!; 774\&1!*7!351!?1(493)\%)!\%, , * +, &19!-\%319! \\ \%, -!34\mathsf{C}19!7^{*})!\% - 0494, (!\%, -!)1(493)\%34^{*}, "!!; , ^{4}, 1!)1(493)\%34^{*}, !49!\%0\%46\%A61!3^{*}!\&+))1, 3! \\ +, -1)()\% - +\%319! - +)4, (!1\%)6G!)1(493)\%34^{*}, !@1)4^{*} - 9"!23 + -1, 39!)1(4931)!AG!\&6\%99!^{*})!5^{*}, *)9!()^{*} + @9! \\ -+)4, (!9@1&474\&!\%, , * +, &1-!34\mathsf{C}19!\%, -!-\%319! \backslash 435!91, 4^{*})9R!\%, -!^{*}351)!9@1&4\%6! - 194(, \%31 - !()^{*} + @9! \\ 74)93!\%, -!351, !351!_+, 4^{*})9R!9^{*}@5^{*}\mathsf{C}^{*})19R!\%, -!7)195\mathsf{C}\%, !\&\%9919!7^{*}66^{*} \backslash 4, ("!!; , 64, 1!)1(493)\%34^{*}, ! \\)1\mathsf{C}\%4, 9!^{*}@1, !+, 346!\mathsf{C}4_{-}, 4(53!A17^{*})1!351!74)93! -\%G!^{*}7!\&\%99!1\%\&5!91\mathsf{C}1931)"! \\ \mathsf{I} \end{array}$

J4)93^G1%)!93+-1, 39!+9+‱G!)1(4931)!7*)!3514)!74)93!91C1931)!-+)4, (!351!@)1&1-4, (!9+CC1)!04%! o**C!C1134, (9!\435!%!31C@*)%)G!%-049*)"!1%)₀G!)1(493)%34*, !7*)!351!9+CC1)!31)C!%, -!7‰6! 91C1931)!*&&+)9!4, !351!@)1&1-4, (!9@)4, (!91C1931)"!115"!Ic35-453Tm/TT41Tf (')Tj ETQp0. 24000. 2412. 0189590. 351, !(*!4, 3*!)1(493)%34*, !*, !8F!; , 64, 1!%, -!\435-)%\!7)*C!351!&*+)91"!!

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 $\# 6!) 13+), 4, (!93+-1, 39!C+93!0\%4-\%31!3514)!) 1 (493)\%34^*, 9!@)4^*)!3^*!351!74)93!-\%6!^7!&6\%99!7^*)!351! 7\%6!\%, -!9@)4, (!91C1931)"!N\colored -\colored 31!3514)!9\colored 5^*+91-!\\colored 354, !8F!; , 64, 1"!#!93+-1, 3!\\S^*!-*19!, *3! 0\colored -\colored 31!7^*)!\%!31)C!C\colored 5\colored 5\colored 13514)!9\colored 5^*+91-e^*+10!, *3! (35-)\colored 5^*+10.5$

pB1)C4994*, !3*!I T&11-!:)1-43!I,)*66C1, 3!a4C439!

f)4331, !@1)C4994*, !7)*C!351!93+-1, 3n9!%&%-1C4&!%-049*)R!9&5**6!-4)1&3*)R!%, -!351! >1%, W>4)1&3*)!*7!23+-1, 3!2+&199!%)1!)1K+4)1-!7*)!)1(493)%34*, $9\beta*3\%4$, ($!351!7*64*\Lambda4$, (!5*+)9i!! O" F, -1)()%-+%31!23+-1, 39!XJ%6!*)!2@)4, (!21C1931)Yid. Z!*)!C*)1!&)1-43!5*+)9!!

- ." S%C19!8464' 4, !Q*, *)9!2&5*6%)9Wa*, (^N%, -1)A+)(!2&5*6%)9!XJ%6!*)!2@)4, (!91C1931)9Yi!..!
- *)!C*)1!&)1-43!5*+)9!!
- =" \$%&516*)!*7!8+94&W\$%&516*)!*7!J4, 1!#)39!93+-1, 39!XJ%%!*)!2@)4, (!91C1931)9Yi!..!*)!C*)1! &)1-43!5*+)9!!
- D" 23+-1, 39!*, !#&%-1C4&!B)*A%34*, !XJ%6!*)!2@)4, (!91C1931)9Yi!OM!*)!C*)1!&)1-43!5*+)9!!!
- E" f 4, 31)!c!2+CC1)![CC1)94*, iqM!*)!C*)1!&)1-43!5*+)9!!
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?1(%)-4, (!91K+1, 34‰!C+94&!&*+)919!X%@@d1-!C+94&R!&6%99!@4%, *R!C+94&!351*)GW%+)‰!9'4‰9R! C+94&!*)(%, 4<%34*, 9YR!93+-1, 39!C%G!1,)*‰!4, !351!&*+)91!61016!A%91-!*, !-1C*, 93)%31-! &*C@131, &G!35)*+(5!@6%&1C1, 3W@)*74&41, &G!1T%C4, %34*, "!>1()11!)1K+4)1C1, 39!7*)!91K+1, 34‰! $\begin{aligned} & 7^{1}:38' 4, (!8F.ZD!%(%4, !A17^{*})1!%331C@34, (!3^{1}@\%99!351!A\%))41)!1T%C"!N^{8}\%!C+94&!1-+&%34^{*}, !\\ & 93+-1, 39i!@61%91!, *31!35%3!@%994, (!351!A\%))41)!1T%C!49!%!@)1^{1}K+49431!7^{*})!81!DEO"!B4%, *!\\ & B)4, & 4@\%69!\%, -!B4\%, *!21&*, -\%)419!1,)*661-!4, !@)40%31!6199^{*}, 9!C%G!%331C@3!351!: 6\%99!B4%, *!\\ & 8\%))41)!IT%C!-+)4, (!3514)!74)93!7^{*}+)!91C1931)9!^{7}!%@@641-!93+-G"![7!)1K+4)1C1, 39!5\%01!, *3!\\ & A11, !&^C@6131-!%3!351!1, -!^{7}!7^{*}+)!91C1931)9R!351!93+-1, 3!C+93!1,)*66!\%, -!@%99!8F!.ZD"!\\ & e1GA^{*}\%)-!9'4669!4, & 66+-1-!4, !351!: 6%99!B4\%, *!$%))41)!IT%C!`466!, *3!A1!&*01)1-!-+)4, (!%@@641-!\\ & 6199^{*}, 9"!V^{*}!\%-1K+%316G!@)1@\%)1!7^{*})!351!1T%CR!93+-1, 39!\%)1!1, & *+)%(1-!3^{*}!*A3%4, !%!6493!^{7}!\\ & : 6\%99!B4\%, *!$%))41)!?1K+4)1C1, 39!7)*C!>)"!: 5+, (^Q\%!e4CR!: **)-4, %3^{*})!*7!: 6\%99!B4\%, *"\\ & !O"!V)\%, 971)!23+-1, 39! \end{aligned}$

#6!3)%, 971)!93+-1, 39!C+93!3%' 1!%!@4%, *!@6%&1C1, 3!1T%C!A17*)1!1,)*64, (!4, !: 6%99! B4%, *"!V)%, 971)!93+-1, 39!\5*!5%01!, *3!&*C@6131-!7*+)!91C1931)9!*7!: 6%99!B4%, *!\46! A1!(401, !@6%&1C1, 3!1T%C9!7*)!&FOZ=R!&FOZDR!%, -W*)!&F.Z="!N*&%6!&+94&! B1)7*)C%, &1!%, -!N*&%6!&+94&!! -+&%34*, !C%_*)9!\5*!5%01!&*C@6131-!3*!G1%)9!*7! : 6%99!B4%, *!\46!A1!(401, !351!: 6%99!B4%, *!\$%))41)!!T%CR!%6!*351)!93+-1, 39!\46!A1! (401, !351!8F!.ZD!B)*74&41, &G!!T%C"!23+-1, 39!\5*!-*!, *3!@%99!351!\$%))41)!!T%C!*)! &F!.ZD!B)*74&41, &G!!T%C!\46!A1!@6%&1-!4, !%, !%@@)*@)4%31!91&34*, !*7!: 6%99!B4%, *!3*!)1C1-G!%, G!-174&41, &419"!23+-1, 39!C%G!)1&1401!%!&*@G!*7!351!1T%C!A17*)1!&6%9919! A1(4, "!V*!: 6%99!B4%, *!7%&+63G!\46!51%)!&F!.Z=!c!.ZD!@6%&1C1, 3!%, -!A%))41)!!T%C9m!

- ! #@@W1-!8+9W8!49!351!93+-G!*7!@1)7*)C%, &1!*, !%! (401, !4, 93)+C1, 3!*)!0*4&1"!V51!93+-1, 3m9!
- ! &5*4&1!*7!%!-1()11!@)*()%C!49!-131)C4, 1-R!4, !@%)3R!AG!351!@1)7*)C%, &1!%)1%X9Y!4, !\54&5!
- ! 351G!%)1!@)*74&41, 3!X%9!-131)C4, 1-!AG!%+-434*, Y!%, -!AG!3514)!&%)11)!%9@4)%34*, 9"!
 - 0"!#@@641-![, -404-+%6![, 93)+&34*, !!!

V51!93+-G!*7!C+94&!@1)7*)C%, &1!4, !@)40%31!6199*-9*411cm,+!94&

• #--434*, %6!%@@641-!4, 93)+&34*, !, *3!3%' 1, !7*)!&)1-43!C%G!A1!%))%, (1-!35)*+(5! 351!8464' 4, !: *CC+, 43G!#)39!#&%-1CG"!2+&5!, *, ^&)1-43!4, 93)+&34*, !\46!, *3! %@@1%)!*, !351!93+-1, 3n9!3)%, 9&)4@3R!\435!3+434*, !3*!A1!@%4-!AG!351!93+-1, 3"!!

. "!21&*, -%)G!#@@641-!23+-G!

 $\label{eq:constraint} \begin{array}{l} \#@@641-!93+-G!A1G^*, -!)1K+4)1C1, 39!C\%G!A1!+91-!3^*!@\%)34\%66!7+67466!351!C+94&!161&3401!\\ 5^*+)9!4, !-1()11!&+))4&+6\%"!\#!93+-1, 3!C\%G!161&3!3^*!3\%' 1!\%--434^*, \%6!@)40\%31!4, 93)+&34^*, !\\ ^*, !\%!91&^*, -\%)G!4, 93)+C1, 3!4, !&^*, 9+63\%34^*, !\435!3514)!\%-049^*)!\%, -!@1, -4, (!\%@@)*0\%6!\\ 7)^*C!A^*35!\%@@641-!4, 93)+&3^*)9!X@)4, &4@\%6!C!91&^*, -\%)GY"!V51!#)1\%!: **)-4, \%3^*)!*7!351!\\ 91&^*, -\%)G!\%)1\%!C+93!)1&1401!\)4331, !, *3474&\%34^*, !*7!351!@6\%, , 1-!1,)*66C1, 3R!4, &6+-4, (!\\ 351!@)^*@^*91-!, +CA1)!*7!&)1-439!*7!93+-G"! \end{array}$

○ #--434*, ‰!%@@641-!4, 93)+&34*, !, *3!3%' 1, !7*)!&)1-43!C%G!A1!%))%, (1-!35)*+(5!

Ţ. B5*, 1^!X. 0LY!D. D^=LOZ!! Ţ. I C%46^!_4%, (S C4664' 4, "1-+! ļ Ţ >%G9!*, !&%C@+9^!8Vf?J! I. B5*, 1^!X. OLY!MEE^. UOD! Ţ I C%46^!%)%+775 C4664' 4, "1-+! ļ !!!!!!!!! B5*, 1^!. OL^E. 0^Z=Z=! !!!!!!!!! I C%46^!696Gs C4664' 4, "1-+! Į. >%G9!*, !&%C@+9^!8Vf J! B5*, 1! %(477*)-<u>sC4664'4, "1-+</u>! Ţ ļ 2*6*!?1&43%6!! k!Q%7!)1&43%!XrUZY!4, &6+-19!=Z!C4, +319!*7!)151%)9%&!51%)4, (R!-)199!)151%)9%!%, -!)1&43%/!@1)7*)C%, &1"!!B%4-!AG!93+-1, 3j)1K+4)1-!)1&43%/9!7*)!8FB[!C!8FBN!C%_*)9!@%4-! AG!2; 8"! k!J+69)1&43%691/1001/21/1001/21/1001/21/1001/21/1001/21/2001/21/2001/21/2001/21/2001/21/2001/21/2001/21/200 Į. Į. @1)7*)C%, &1"!!B%-!AG!93+-1, 3j)1K+4)1-!)1&43%/9!7*)!8FB[!C!8FBN!@%4-!AG!2; 8"! Į. İ. k!J11!7*)!%--434*, %!91)04&19!49!r0ZWOE!C4, +319!*)!rDZW5*+)"!B%4-!AG!93+-1, 3"! Į. 8%931)!: 6%99W#)1%!?1&43%6! k!r=Z!@1)!C%931)!&6%99!*)!%)1%!)1&43%!*)!1K+40%61,3!6*%-!&)1-43!7*)!35*91!*,!%-_+,&3! &*, 3)%&39"!B%4-!AG!2; 8"! k!J11!7*)!%--434*, %%!91)04&19!49!r0ZWOE!C4, +319!*)!rDZW5*+)"!B%4-!AG!93+-1, 3"! İ. V5+)9-%G!?1&43%6! k!>194(, %31-!2; 8!%&&*C@%, 493!X[0%, Y!95*+6-!A1!+344<1-!\51, !@*994A61!

k!J*)!*351)!93%77!%&&*C@%, 4939i!

k!rHZ!@1)!)1&43%6j

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pp![7!93+-1, 3!7%469!3*!%331, -!_+)GR!%&&*C@%, 493!\466!A1!@%4-m!351!93+-1, 3!\466! A1&*C1!)19@*, 94A61!7*)!%&&*C@%, 493!711!47!@1)C4994*, !3*!)19&51-+61!49! %\%)-1-"! İ 2; 8!1, 3)G!#+-434*, 9! İ k!J%&+63G!%&&*C@%,4939!r.Z!@1)!%+-434*,!@%4-!AG!351!2;8! İ k!23+-1, 3!%&&*C@%, 4939!r0Z!@1)!%+-434*, !@%4-!AG!351!2; 8! Ţ ; 351)!21)04&19!XBeaR!Q*6649R!: *, &1)3*W#)4%Y! k!r0ZWOE!C4, +319!*)!rDZW5*+)"!B%4-!AG!2; 8"! Į. 11 0"!\$17*)1!`*+!: *, 3%&3!%, !#&&*C@%, 493i! k!e, *\!351!1T%&3!-%31R!34C1R!%, -!6*&%34*, !*7!G*+)!101, 3"!?1C1CA1)i!`*+! C+93!&*, 3%&3!351!%&&*C@%, 493!%, -!@)*04-1!C+94&!%3!61%93!*, 1!C*, 35!4, ! %-0%, &1!7*)!)1&43%69!%, -!3*!\11'9!4, !%-0%, &1!7*)!93+-4*!)1&43%69!*)!94, (61!

@41&19!7*)!351!V5+)9-%G!?1&43%%!Q*+)"! k!e, *\!1T%&36G!\5%3!)1@1)3*4)1!G*+!, 11-!3*!A1!%&&*C@%, 41-"!J*)!1T%C@61R!47! 4319!*, 6G!351!91&*, -!C*01C1, 3!*7!%!9*, %3%R!C%' 1!35%3!7%&3!&61%)!3*!351! @4%, 493"!

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 $\begin{aligned} & \int \frac{1}{4} + (3G! \setminus \frac{4}{4}) \frac{3}{3} + \frac{1}{1} + \frac{$

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 $\begin{array}{l} k! \# !93 + -1, 3!95^* + 6 - !C\%' 1!101)G!177^*)3!3^*!, *347G!351!4, 93) + &3^*)! \\ \lambda 100 + 100$

 $\begin{array}{l} k!\#331, -\%, \ \&1!49!)1K+4)1 - !\%3!\%6!)151\%)9\%69"!![, \ !351! 101, \ 3!*7!46, \ 1998! 93+-1, \ 39!95*+6-!, \ *347G! 351! \\ \%@@)*@)4\%31!1, \ 91CA61!-4)1&3*)!A17*)1!351! 9&51-+61-!)151\%)9\%6"! \\ k![7!\%! 93+-1, \ 3!-*19!, \ *3!7116! \ 166!1, \ *+(5!3*!@6%G!*)! 94, \ (R!A+3!49! 93466! \ 166!1, \ *+(5!3*!\%331, \ -! \\ \&6\%9919R! 351G! 95*+6-! 93466! \%331, \ -! 351! 9&51-+61-!)151\%)9\%69R!+, \ 6199! 1T&+91-! AG! 351! 1, \ 91CA61! \\ -4)1&3*)"! &8+&5! 5\%@@1, \ 9!4, \ !\%!)151\%)9\%6! 35\%3! \ \ 466!A1, \ 1743! 351! 93+-1, \ 3!101, \ !47! 351G!\%)1!+, \ \%A61! 3*! \\ @1)7*)C"! \\ ! \end{array}$

k!#66!C+94&!7%&+63G!\466!93)4&36G!%-51)1!3*!351!-%G!%, -!34C1!9&51-+61!*7!&66%9919!%, -!)151%)9%69! %9!@)4, 31-!*)!6199*, 9!%9!%))%, (1-!%, -!)1@*)31-!4, !351!91C1931)!9&51-+61"!!!T3)%!&6%9919!*)!)151%)9%69!*7!%, G!'4, -!\466!A1!)1@*)31-!3*!%, -!&61%)1-!AG!351!2&5**6!*7!&+94&!*774&1!4, ! %-0%, &1!*7!351!%&34043G!3*!%0*4-!&*, 764&39!\435!*351)!%&34043419! $\begin{array}{l} \$14, (!9+&\$1997+6!C+94\$!93+-1, 3!)1K+4)19!C\%, \%(4, (!9+A93\%, 34\%6R!9167^-4)1\$31-!)19@*, 94A463419!\\ *+394-1!351!\&6\%99)^{**}C"!!\#9!9+&\$5R!1T\$1661, 3!^{*})(\%, 4<\%34^{*}, \%6!9'4669!\%)1!^{*}7!@\%)\%C^{*}+, 3!4C@^{*})3\%, \$1! \end{array}$

! ! >1%, |*7!23+-1, 3! > 1016*@C1, 3"!V549!61331)! \times 469! $(A1!-193)*G1-!\times51$, !351!93+-1, 3!()%-+%319!7)*C!351!F, 401)943G!+, 6199!%!91&*, -!A)1%&5!*7!4, 31()43G!*&+)9"!! \$17*)1!%994(, 4, (!%, $!\vee JR!351!7\%\&+63G!C1CA1$)! \times 466!)1041 \times !351!943+%34*, $!\times435!351!\&5\%4$)!%, $-W^*$)! -4)1& 3^*)!%, -!-1%, "![7!%, $!\vee J!49!\%994($, $1-!7^*$)!351!&*+)91R!351!7%&+63G!C1CA1)!9!61331)!*7! 1T@6%, %34*, !A1&*C19!%!@1)C%, 1, 3!@%)3!*7!351!93+-1, 3!9!)1&*)-R!%, $-!351!\vee J!$)1C%4, 9!%9!%!@1)C%, 1, $3!()\%-1R!\times54\&5!\&\%$, *3!A1!)1C*01-!7)*C!351!3%, $9\&)4@3"!Q^{1}(101)R!93+-1$, 39!C%6!

) $1@1\%3!351!\&^{+})91!7^{+}!\&$ $1-43!3^{+}\%)-!()\%-+\%34^{+}, "![7!\%!91\&^{+}, -!04^{+}6\%34^{+}, !^{*}\&\&)+91!9+A91K+1, 3!3^{+}!$ 351!74)93!A) $1\%\&5!^{7!4}$, 31()43GR!351!>1%, $!^{7!23+-1}$, $3!>1016^{+}@C1$, $3!^{466!}A1(4, !-49\&4@64, \%)G!\%$, -! $_+-4\&4\%!@)^{*}\&19919!^{7!351!}F$, 401) $943GR!\%9!^{*}+364$, 1-!4, !351!23+-1, 3!Q%, $-A^{**'}$ " $!2^{*}C1!@)^{*}()\%C9!$ %, $-!C\%_{*})9!5\%01!C^{*})1!1T@64\&43!1354\&\%!93\%$, $-\%)-9!^{54\&5!}9+@1)91-1!3549!B^{*}64\&GR!\%$, $-!04^{*}6\%34^{*}$, $!^{7!}$ 54&5!C%G!)19+63!4, $!-49C499\%!7)^{*}C!9^{*}C1!@^{*}()\%C9!^{*})!C\%^{*})9!^{4354}$, !351!F, 401)943G"!!

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V51!2&5**6!*7!8+94&!B1)7*)C%, &1!#99199C1, 3!J*)C!49!+344<1-!3*!10%+%31!%6!!%+-434*, 9R!)1&43%69R!%, -!_+)419"!!J%&+63G!%)1!4, 93)+&31-!3*!\)431!&*CC1, 39!%A*+3!351!93+-1, 3!9! @1)7*)C%, &1!%, -!3*!&4)&61!351!%@@)*@)4%31!, +CA1)9!4, !351!)+A)4&!C%3)4T"!

! 0"!23%31C1, 3!*7!@+)@*91!!

!! k!

@)*()%C!&*@G!7*66*\4,(!351!51%)4,	(R!\54&5!C+93!A1!(401,!3*!351!%@@64	1-!4, 93)+&3*)!
, *!6%31)!35%, !*, 1!∖11' !@)4*)!3*!35	1!)1&43%%!-%31"!	

D"!J%%+)1!3*!@%99!351!51%)4, (!

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! k![7!351!93+-1, 3!7%469!3*!@%99!351!51%)4, (R!

23+-1, 38!7%&+63GR!%, -!(+193!)1&43%69!9%, &34*, 1-!AG!351!2; 8!%)1!@)1^%@@)*01-"!#66! 2; 8!1, 91CA61!&*, &1)39!%)1!94C46%)6G!%@@)*01-"!B)*()%C9!95*+6-!A1!9+AC4331-!3*!351! %@@41-!31%&51)!7*)!4, 93%, &19!\51)1!)1&43%6!%331, -%, &1^3%'1)9!\1)1!, *3!@)191, 3"! ="!#331, -%, &1!?1&*)-9! V51!9+C!*7!1%&5!93+-1, 3|9!)1K+4)1-!)1&43%!%331, -%, &1!49!)1&*)-1-!4, !3*R!91@%)%31! 6*&%34*, 9R!351!%@@641-!4, 93)+&3*)|9!)1&*)-!%, -!\$%, , 1)!X8F!; , 64, 1Y"!V51!93+-1, 3! 95*+6-!&*, 9+63!3514)!%@@641-!4, 93)+&3*)!)1(%)-4, (!351!7*)C1)"! D"!?1&*)-4, (!*7!?1&43%6!#331, -%, &1!!! #!93+-1, 3!*)'1)!X%331, -%, &1^3%'1)Y!\46!A1!93%34*, 1-!%3!%!-194(, %31-!6*&%34*, !@)4*)! 3*!351!@1)7*)C%, &1!%, -!\46.98%, !351!93+-1, 3.9![>!&%)-!A17*)1!%, -!%731)!351!101, 3"!! [,!35191!4,93%,&19R!%331,-%,&1!49!%+3*C%34&%66!)1&*)-1-!4,!\$%,,1)!%,-!%&&1994A61!AG! A*35!351!93+-1, 3!%, -!%@@41-!31%&51)"!J*)!%@@)*01-!2; 8!101, 39!\51)1!%!93+-1, 3! *)' 1)!5%9!, *3!A11, !%994(, 1-!*)!49!%A91, 3R!351!%331, -4, (!93+-1, 3!C%G!9+AC43!%! @)*()%C!3*!351!2; 8!*774&1!7*)!)1&*)-4, (!4, !\$%, , 1)"!V51!@)*()%C!C+93!4, -4&%31!351! 93+-1, 319!, %C1!%, -![>!, +CA1)!3*!A1!3%641-"!B*64&419!)1(%)-4, (!351!)1&*)-4, (!*7!)1&43%6!%331, -%, &1!7*)!%6!*351)!101, 39!49!351!)19@*, 94A4643G!*7!351!%@@641-!4, 93)+&3*)"!

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k!V51!@)*&199!*7!9&51-+4, (!2; 8R!2; V#>R!%, -!e4)'6%, -!21)419!101, 39!A1(4, 9!\435!%! §&%61, -%)!C1134, (h!&*, 01, 1-!AG!351!: J#!>1%, !1%&5!7%6!91C1931)"!Q391!4, 93%, &19R!%3, 9!\435!%! Ţ. k!V51!7%&+63G!C1CA1)!95*+6-!)1K+4)1!@%)34&4@%34, (!93+-1, 39!3*!-49&+99!351!%A91, &1!\435! Ţ. 3514)!@)*7199*)9!\16!!4, !%-0%, &1!*7!351!101, 3"![3!49!%-0491-!35%3!3549!-49&+994*, !A1! I. @)191, 31-!4, !351!7*)C!*7!%!*)1K+193***?**!, *3!%!, **3474&%34**, "! I. k!#3!61%93! R!351!9+@1)0494, (!7%&+63G!C1CA1)!C+93!, *347G!%66!! 2; 8!7%&+63G!*7!351!%A91, &1R!4, 7*)C4, (!351C!*7!-%319R!34C19R!%, -!@%)34&4@%34, (!! Į. 93+-1, 39"!#!&*@G!*7!351!C1C*!95*+6-!A1!@)*04-1-!3*!351!93+-1, 3!7*)!&6%9919!*+394-1!351!! ļ 2; 8"!! I. k!V51!93+-1,3!49!)19@*,94A61!7*)!%))%,(1C1,39!3*!&*C@6131!%,G!C4991-!%994(,C1,39!*)! 1T%C9"!! | | | Ţ #, G!%-!5*&!%&34043GW101, 3!9%, &34*, 1-!AG!%!7%&+63G!C1CA1)R!3%'4, (!@6%&1!*+394-1!*7!)1(+6%)! &&%99!34C1R!C+93!A1!%--1-!3*!351!2; 8!I01,39!&%(1,-%)"![7!93+-1,3!%331,-%,&1!49!)1K+4)1-R! 351!7*66*\4, (!@)*&1-+)1!C+93!A1!7*66*\1-i! k!2+AC43!351!)1K+193!3*!351!2; 8!>4)1&3*)!7*)!-4991C4, %34*, !3*!351!I, 91CA61!: *CC43311!%3! 61%93! "![, &+-1!-%319R!34C19R!%, -!%!)*931)!*7! 93+-1, 39!@%)34&4@%34, ("!: 51&' !351!2; 8!I01, 39!: %1, -%)!7*)!@*31, 34%6!&*, 764&39!A17*)1! 9+AC4334, ("! Ţ. k!F@*, !9+AC4994*, R!351!I, 91CA61!: *CC43311!\46!)1041\!351!)1K+193!%, -!-164A1)%31!! @*31, 34%/!&*, 764&39!7*)!%!@1)4*-!*7!%3!61%93!*, 1!\11'"!#@@)*01-!)1K+1939!\466!A1!%--1-!3*!! Ţ. Ţ. 351!2; 8!I 01, 39!: %1, -%)!4CC1-4%316G"! Ţ.

 $\begin{array}{l} k![, !\%\&\&^*) - \%, \&1! \setminus 435!F, 401)9436!)1 (+6\%34^*, 9R!, *!\%\&^*5^*64\&!A101)\% (19!C\%G!A1!91)01 - !\%3! \\ 93 + -1, 3!7 +, &34^*, 9!516 - !*, !\&\%C@+9"!! \end{array}$

! E"!?1&*)-4, (!*7!?1&43%69!

> k!2&5**6!*7!8+94&!)1&43%69R!&*,&1)39!%, -W*)!@1)7*)C%,&19!*&&+))4,(!*,!&%C@+9! Xe%1+@1)!Q%6R!e4)'6%, -R!#6A1)3!V%G6*)R!%, -!B464,(Y!*)!%3!f 193C4,931)!%, -!: 1,3)%6! :5)4934%,!:5+)&5!\4641!)1&*)-1-!AG!-17%+63!4,!91)04&1!3*!351!2;8"!V51!C%931)!7419! \464A1!%0%46%A61!7*)!-*\,6*%-!%, -W*)!93)1%C4,(!\4354,!31,!-%G9!*7!351!@1)7*)C%,&1"! V51!)1&*)-1-!@1)7*)C%,&19!\464A1!93*)1-!*,!%!]11Tf(VI(]1)-1(1Tf(VI(]1)-1(1Tf(VI(]1)-1(1Tf)))

 $\begin{array}{l} k!?193)4&31-!F91!?**C9!\%1!9*!-194(,\%31-!7*)!+91!AG!93+-1,39!@)\%834&4, (!&1)3\%4, !4,93)+C1,39"!!\\ e1G9!7*)!35191!)**C9!\%4&0!A1!499+1-!4, !351!2&5**&0!*7!8+94&!*774&1"!; ,&G!93+-1,39!3%'4, (!\\ \%@@&41-!@4\%,*!&199*,9!C\%G!@)\%834&1!*,!351!2&14,\%G!4,!B8:!==0"!!V51!'1GA*\%)-!\%)1\%!\\ \&^{**})-4,\%3^*)!\%4&0!,*347G!@4\%,4939!\%51,!35191!'1G9!C\%G!A1!@4&'1-!+@!4,!351!21&+)43G!*774&1"!\\ k!]*!C+94&!7\%&+63G!93+-4*9!\%)1!3*!A1!+91-!7*)!93+-1,3!4,-404-+\%!@)\%834&1!@+)@*919!%3!\%,G!\\ 34C1!1T&1@3!AG!@1)C4994*,!*7!351!>4)1&3*)"!!,7*)&1C1,3!*7!3549!@*64&G!49!351!)19@*,94A4643G!*7!\\ 351!4,-404-+\%!7\%&+63G!C1CA1)"! \end{array}$

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 $\begin{array}{l} k!: \end{tabular} & k!: \end{tabular}$

Ţ. V51!: *, 3)%83!7*)!84661'4, !F, 401)943G!; \, 1-![, 93)+C1, 39.C+93!A1!94(, 1-!AG!351!93+-1, 3!%, -! Į. 351!7%&+63G!4, !&5%) (1!*7!351! (401, !@1)7*)C%, &1!4, 93)+C1, 3"!a*93!4, 93)+C1, 39!C+93!A1! Į.)1@%&1-!AG!351!93+-1, 3"!?1@%4)!&*939!-+1!3*!, 1(બ(1, &1!C+93!A1!@%4-!AG!351!93+-1, 3"! Į.

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2&5**6^*\, 1-!C135*-9!4, 93)+C1, 39!%, -!4, 93)+C1, 39!@)*04-1-!AG!351!+, 401)943G!7*)!+91!4, ! C135*-9!&6%9919!%)1!%994(, 1-!AG!351!&*+)91!4, 93)+&3*)"!!V51!7%&+636!4, !&5%)(1!*7!C135*-! 4, 93)+C1, 39!%9!64931-!A16*\!%)1!)19@*, 94A61!7*)!9114, (!35%3!%66!C135*-9!4, 93)+C1, 39!4, !3514)! %)1%!5%01!A11, !)13+), 1-!4, !(**-!*)'4, (!*)-1)!%3!351!1, -!*7!1%&5!91C1931)"!

J%&+63G!4, !: 5%)(1!*7!	8135*	-9![, 93)+0	C1, 39i	ļ	
[94-*)%!]*_'*	04&!	ļ	ļ	ļ	\$*\1-!23)4, (1-![, 93)+C1, 39!
8%)' !V*, 164!	ļ	ļ	ļ	ļ	∕+43%)9!
B1))G!?%9'!	ļ	ļ	ļ	ļ	2%T*@5*,19R!J6+319!%,-!B4&&*6*9!
:6%4)1!V%G6*)!	ļ	ļ	ļ	ļ	;
>%04-!: **'!	ļ	ļ	ļ	ļ	:6%)4, 139R!4, &6"!%63*R!A%99R!&*, 3)%!
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i i	ļ	ļ	ļ	ļ	V)+C@139R!: *), 139R!J)1, &5!Q*), 9!
S1)1CG!\$)+, '	!!	ļ	ļ	ļ	B1)&+994*, !
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V51!: *, 3)%83!7*)!84664'4, !F, 401)943G!; \, 1-![, 93)+C1, 39.C+93!A1!94(, 1-!AG!351!93+-1, 3!%, -! C135*-9!4, 93)+&3*)"!a*93!4, 93)+C1, 39!C+93!A1!)1@6%&1-!AG!351!93+-1, 3"!?1@64)!&*939!-+1!3*! , 1(4(1, &1!C+93!A1!@%4-!AG!351!93+-1, 3"! L

[,93)+C1,39!C%G!A1!)1&%61-!%3!%,G!34C1!47!31C@*)%)46[,11-1-!AG!351!F,401)943G!7*)!)1@%4)!*)! 47!351!93+-1, 3!04*6%319!351!&*, -434*, 9!*7!351!&*, 3)%&3!94(, 1-!\51, !351!4, 93)+C1, 3!\%9!499+1-"! #A+91!*7!351!4, 93)+C1, 3!AG!%, G!4, -404-+%!C%G!)19+63!4, !6*99!*7!351!@)40461 (1!*7!+94, (!351! 4, 93)+C1, 3"!![, !%--434*, R!351!93+-1, 3!\46!A1!)1K+4)1-!3*!@%G!7*)!)1@%4)!*)!)1@6%&1C1, 3!*7!351! -%C%(1-!4, 93)+C1, 3"!!!Ţ.

#, !4, 93)+&3*)!C%G!)191)01!351!)4(53!3*!\4355*6-!()%-1!&)1-43!7)*C!%!93+-1, 3!\5*!5%9!, *3!)13+), 1-!+, 401)943G^{*}∖, 1-!@)*@1)3G"!

V51!+91!*7!9&5**6^*\, 1-!4, 93)+C1, 39!7*)!%, G!@+)@*91!*+394-1!*7!+, 401)943G!7+, &34*, 9!C+93! A1!%@@)*01-!AG!351!9+@1)0494, (!7%&+63G"!J%4+)1!3*!%-51)1!3*!3549!@*64&G!\466!\19+63!4, !-1, 466!*7! 351!+91!*7!%6!9&5**6^{*}×, 1-!4, 93)+C1, 39!%, -R!4, !1T3)1C1!&%919R!-49C499%6!7)*C!351!2&5**6!*7! 8+94&"!

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ļ	k!24(,^+@!7*)!6*&'1)9!∖466!3%'1!@6%&1!,*!C*)1!35%,!*,1!∖11'!4,!%-0%,&1!*7!351!74)93!-%G!*7!

Į. &6%9919!1%&5!7%6"!

- ļ k!B)4*)43G!\464.A1!(401,!3*!C+94&!C% *)9!%,-!C4,*)9"!
- İ k!23+-1, 39!%)1!1T@1&31-!3*!94(, !+@!7*)!351!9C%6193!6*&' 1)!9+43%A61"!]*!93+-1, 3!\466.
- I. C*)1!35%, !*, 1!6*&' 1)"!V51!2&5**6!*7!8+94&!93%77!95%6!C%' 1!351!74, %6!-131)C4, %34*, !*7!\54&5! Ţ 6*&'1)!49!%@@)*@)4%31"!
 - k!]*!)19@*,94A443G!7*)!C%31)4%69!6173!4,!6*&'1)9!49!4C@61-!*)!%99+C1-!AG!351!2&5**6!*7!8+94&!

)!351!F, 401)943G"!a&'9!6173!*, !6*&'1)9!%3!351!1, -!*7!G1%)!\464A1!)1C*01-!AG!+, 401)943G!93%77"! k!#, G!C%31)4%6!6173!4, !6*&'1)9!%731)!351!1, -!*7!351!9@)4, (!91C1931)!\464A1&*C1!@)*@1)3G!*7! 351!+, 401)943G"!

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43!\464!, *3!A1!@*994A61!7*)!%!93+-1, 3!31%&51)!3*!@%)34&4@%31!4, !%, !1, 91CA61!-+)4, (!351!)1(+6%)! 31%&54, (!-%G!101, !-+)4, (!351!71\!\11'9!A17*)1!%, -!%731)!93+-1, 3!31%&54, ("!

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#60!7%&+63G!)1K+1939!7*)!)161%91!7)*C!93+-1,3!31%&54,(!*A64(%34*,9!C+93!(*!35)*+(5!351!:5%4)!

1K+4@C1, 3R!%, -!31&5, *6* (G"! ļ #9!@%)3!*7!439!)1(+6%)!*@1)%34*, R!351!2&5**6!*7!8+94&!5%9!-1016*@1-!@*64&419R!@)*3*&*69R!%, -! @)*&1-+)19!3*!(+%)-!%(%4, 93!4, +)G!%, -!46, 199!4, !351!93+-G!%, -!@)%&34&1!*7!C+94&"! J+)351)C*)1R!351!2&5**6!*7!8+94&!5%9!-1016*@1-!C1%, 9!*7!)%494, (!%\%)1, 199!%C*, (!*+)! 93+-1, 39!%, -!7%&+63G!*7!351!&*, , 1&34*, 9!A13\11, !C+94&4%, 9!51%635R!351!9+43%A4643G!%, -!9%713G! *7!1K+4@C1,3!%,-I31&5,*6*(GR!%,-I351!%&*+934&!%,-I*351)!51%35^)16%31-!&*,-434*,9!4,!351! F, 401)943GI9!@)%&34&1R!)151%)9%6R!%, -!@1)7*)C%, &1!7%&4443419"! I. 1 101)35161998!43!49!4C@*)3%, 3!3*!, *31!35%3!4, -404-+%6%, -18*)@*)%31!51%635!%, -19%713G!-1@1, -9! 6%) (16G!*, !@1)9*, %!-1&494*, 9!C%-1!AG!4, 7*)C1-!4, -404-+%69"!8464' 4, !F, 401)943G!%, -!351! 8464'4, !F, 401)943G!2&5**6!*7!8+94&!5%01!51%635!%, -!9%713G!)19@*, 94A4643419R!A+3!7+67466C1, 3!*7! 35191!)19@*, 94A443419!%6*, 1!&%, , *3!%, -!X46!, *3!1, 9+)1!%, G!4, -404-+%69!51%635!%, -!9%713G! *+3)4(53"!V**!C%, G!7%&3*)9!A1G*, -!351!F, 401)943GI9!&*, 3)*6!%)1!4, 0*601-"! Į. 1%&5!4, -404-+%149!@1)9*, %6G!)19@*, 94A61!7*)!%0*4-4, (!)49'!%, -!@)101, 34, (!4, +)419!3*!

@)101, 34*, R!%, -!351!@)*@1)!5%, -64, (!%, -!*@1)%34*, !*7!@*31, 34%66[-%, (1)*+9!C%31)4%69!

 $\begin{array}{l} 351C916019!A17^*)1R! - +)4, & (R!\%, -!\%731)!93 + -G!\%3!351!8464'4, !F, 401)943G!2&5**6!*7!8 + 94&"!V51!\\ @*64&419R!@)*3*&*69R!\%, -!*@1)\%34^*, \%6!@)*&1 - +)19! - 1016*@1 - !AG!351!2&5**6!*7!8 + 94&!-*!, *3!%631)!\\ *)!&\%, & 16!\%, & G!4, -404 - +\%69!@1)9^*, & \%6!)19@*, & 94A4643GR!*)!4, !\%, & G!\%6!95473!@1)9^*, & \%6!)19@*, & 94A4643G!\\ 7^*)!351!)19 + & 39!*7!\%, & G!4, -404 - +\%69!@1)9^*, & \%! - 1&494^*, & 9!*)!\%&34^*, & 9!4, !\%, & G!4, & 93\%, & 1!*)!*01)!34C1!\\ 3^*!351!F, & 401)943G"! \end{array}$

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#, G*, $1! \\ 5*!@) & 34&19R! \\ 151% \\ 919R! \\ !@1)7* \\ C9!4, 93) + C1, 3\%! \\ !!0*&\%!C + 94&!C + 94&!5\%9!351!@*31, 34\%! \\ 3*!9+771)!4, _+)G! \\ 16\%31 - !3*!35\%3! \\ & 34043G!!#6!C + 94&4\%, 9!\%) \\ 1!\%3! \\ 9!\% \\ !1\%1 \\ !!1\%1 \\$

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B4%, 493!: 5%)619!?*91, !@*4, 39!*+3!35%3!351!C+94&!*, 1!C%' 19!\4643%31!351!A*-46G!93%31!*7!351!

- O" I T1)&491!)1(+6%)6G"!#O*4-!93)1, (351, 4, (!1T1)&4919!X)19493%, &1!3)%4, 4, (R!∖14(53^64734, (R!13&"Y! &5**91!4, 931%-!3*!&)*99^3)%4, !AG!%!93)4&3!&%)-4*!)*+34, 1!%, -!3*3%6!A*-G!743, 199"^{\$}! !
- ." /13!%-1K+%31!)193"!V5*+(5!54(51)!%C*+,39!%)1!)1&*CC1,-1-R!%3!61%93!H!5*+)9!*7!9611@!%3! ,4(53!49!%-1K+%31"!
- =" | %3!%!A%6%, &1-!-413"![, &6+-1!01 (13%A619R!7)+43!%, -!\5*61!()%4, 9"!#0*4-!&%7714, %31-!-)4, '9!%, -! %6&*5*6"!B%G!%331, 34*, !3*!G*+)!*\, !@1)9*, %6!-413%)G!, 11-9!%, -!)193)4&34*, 9"!
- D" 8%4, 3%4, !A*-G!5G-)%34*, m!-)4, '!%3!61%93!3*!K+%)39!XHD!76"!*<"Y!*7!\%31)!-%46G"! !
- 0" I 0%+%31!G*+)!31&5, 4K+1!j !@%G!%331, 34*, !3*!G*+)!A*-G!%, -!C%4, 3%4, !%\%)1, 199!A17*)1!G*+! 1T@1)41, &1!@%4, "!] *34&1!47!G*+!5%01!%!5+, &51-!A%&' R!47!G*+!5+, &5!G*+)!95*+6-1)9R!*)!47!G*+!

! OD" V%' 1!7+66!%−0%, 3%(1!*7!351!3*!7)11!161C1, 39!*7!0*&%6!7*6-!51%64, (i!\%31)!%, -!%4)"! OE" ! !

O" N*&%6!%3561319!C+93!3)1%3!3514)!C+9&+6*9'1613%6!9G931C!%9!-*!*351)!3G@19!*7!%3561319m! 351)17*)1R!O*&%6!\%)C^+@9!95*+6-!%6\%G9!A1!+91-!@)4*)!3*!94, (4, ("!N*&%6!&**6^-*\, 9!%)1!%69*! 1991, 34%6!3*!'11@!351!94, (4, (!O*4&1!51%35G"!/1, 36G!93)13&54, (!C+9&61!()*+@9!%, -!1%94, (!4, 3*! 93)13&519!7*)!1%&5!C+9&61!()*+@!516@9!3*!&4)&+6%31!A6**-!3*!%66!@%)39!*7!351!A*-G!4C@*)3%, 3!3*! @)%&34&1!j!

- E" ?16%T!\\435!-4771)1, 3!9167^&%)1!%&34043419"!Q%04, (!%!71\\-4771)1, 3!%&34043419!%3!G*+)!-49@*9%6!49! '16"!IT%C@619!C4(53!6**'!64'1!3%'4, (!34C1!3*!C1-43%31R!(13!*+3!4, !, %3+)1R!@%)34&4@%31!4, ! &)1%3401!%&34043419R!911!%!, 1\!@)*-+&34*, R!%, -!C*)1"!!!
- H" V%' 1!34C1!)1(+6%)6G!3*!1, 9+)1!35%3!G*+!%)1!&%)4, (!7*)!G*+)9167!9*&4%66GR!1C*34*, %66G!%, -! @5G94&%66G"![7!*, 1!*7!35*91!%)1%9!49!6%&'4, (R!5%3!&%, !G*+!-*!3*!C1-4%31!35%3x!
- L" $e11@!4, !3*+&5! \times 435!7\%C46G!\%, -!7)41, -9!\%, -!3\%' 1!9*C1!34C1!3*!9@1, -!34C1! \times 435!G*+)!9+@@*)3!$ 9G931C"!\$+46-4, (!, 1 \times !7)41, -954@9!\%, -!9+@@*)39!*, !&%C@+9!49!‰9*!01)G!A1, 174&4‰"!

!V51!5+CC4, (!*7!%!)17)4(1)%3*)!49!DE!-1&4A169R!, *)C%6!&*, 01)9%34*, !49!%@@)*T4C%316G!HZ!-1&4A169R! %, -!351!, *491!7)*C!51%0G!&43G!3)%774&!&%, !)1%&5!ME!-1&4A169"!2*+)&19!*7!, *491!35%3!&%, !&%+91!] [Qa!4, &6+-1!C*3*)&G&619R!74)1&)%&' 1)9R!%, -!9C%66!74)1%)C9R!%66!1C4334, (!9*+, -9!7)*C!O. Z!3*!OEZ! -1&4A169"!a*, (!*)!)1@1%31-!1T@*9+)1!3*!9*+, -9!%3!*)!%A*01!ME!-1&4A169!&%, !&%+91!51%)4, (!6*99"! V51!6*+-1)!351!9*+, -R!351!95*)31)!351!34C1!@1)4*-!A17*)1!] [Qa!&%, !*&&+)"!! [, !%!3)%-434*, %!9GC@5*, G!*)&5193)%R!351!+@@1)!**-\4, -9!)1%&5!-\$!610169!7)*C!000^0DER!\$)%99! 7)*C!0ZH^0=UR!%, -!93)4, (9!7)*C!ME^0ZZ!-\$!j !35191!610169!%)1!-%, (1)*+9!\51, !1T@*9+)1!6%939!7*)! C*)1!35%, !%!71\!C4, +319"!#, !4, -404-+%l9!-%l6!-*9%(1!*7!9*+, -!*+(53!3*!1K+%lME!-\$!*01)!14(53! 5*+)9!j !1K+40%1, 3!3*!351!9*+, -!*7!*, 1!@%G4, (!*, 1!9!*\, !04*6%!9*6*!4, !%!@)%&34&1!)**C"! : A04*+96GRIC+94&4%, 91%)11%31%154(51)49'17*)11 [Qa"1 İ. #C*, (!C+94&4%, 9R!351!74)93!9GC@3*C9!*7!][Qa!%)1!%!6%&'!*7!-49&1), C1, 3!*7!@43&5!%, -!4, 3*, %34*, R! 4, 31)@)13%34*, !*7!-G, %C4&9R!%, -!C1%9+)1C1, 3!*7!95%-19!*7!&*6*)!%, -!34CA)1"!"![3!49!01)G! 4C@*)3%, 3!3*!+, -1)93%, -!35%3!351!5%)!&169!4, !G*+)!4, , 1)!1%)!&%, , *3!)1(1, 1)%31"!>%C%(1!-*, 1!3*! 351C!49!@1)C%, 1, 3"!V51)1!49!&+))1, 36G!, *!\%G!3*!)1@%4)!*)!+, -*!3549!-%C%(1"![7!G*+!7116!G*+! C%G!A1!1T@1)41, &4, (!] [QaR!9@1%' !\435!G*+)!%@@641-!4, 93)+&3*)!)4(53!%\%G"! İ. Т 0"!F3464<1!51%)4, (!@)*31&34*, !\51, !@6%G4, (!4, !%, !1, 91CA61!*)!\51, !@)%&34&4, (!7*)!6*, (!@1)4*-9!*7! 34C1"!I 3GC*34&!?191%)&5!*771)9!&+93*C^-194(, 1-!8+94&4%, I9!I%)@6+(9!35%3!&%, IA1!7*+, -!%3!6*&%! %+-4*6* (4939!!*774&19"! Į. . "!B)%&34&1!%3!5%67^-G, %C4&"! ="!#631), %31!)1@1)3*4)1!\5461!@)%&34&4, (!j !95473!A13\11, !K+413!%, -!6*+-!91&34*, 9!%, -!@41&19"!! D"!84, 4C4<1!+, , 1&199%)G!9*+, -!1T@*9+)1!j !3549!&%, !4, &6+-1!0*6+C1!*7!351!)%-4*!%, -!@1)9*, %! 161&3)*, 4&!-104&19R!6*+-!)193%+)%, 39!%, -!@%)3419R!\51, !+94, (!161&3)4&!%@@64%, &19"! E"!Q+C!A17*)1!%, !1T@1&31-!6*+-!, *491"!f 51351)!%!&GCA%!&)%95!*)!97*)<%, -*R!%!964(53!5+C!A17*)1! %, -!-+)4, (!351!9*+, -!A6*&' 9!351!1%)I9!%A443G!3*!3%' 1!4, !, 1\!9*+, -"! Т H"!23*@!9C*'4, ("!2C*'4, (!C*)1!35%, !-*+A619!351!)49'!*7!] [Qa"!#! Į. #&&*)-4, (!3*!351!#C1)4&%, !#&%-1CG!*7!#+-4*6* (GR!%@@)*T4C%316G!. H!C4664*, !#C1)4&%, 9!5%01!51%)4, (! 6*99"!; , 1!4, !35)11!-1016*@1-!3514)!51%)4, (!6*99!%9!%!)19+63!*7!1T@*9+)1!3*!, *491"!#9!G*+!@+)9+1!G*+)! -%G^3*^-%G!%&34043419R!A*35!4, !351!>1@%)3C1, 3!*7!8+94&!%, -!4, !*351)!1-+&%34*, %&?!0*&%34*, &&?!)1&)1%34*, %6!1, 04)*, C1, 39R!)1C1CA1)i! 0"!Q1%)4, (!51%635!49!1991, 34%6!3*!G*+)!64716*, (!9+&&199!%9!%!C+94&4%, "!

. "!`*+)!51%)4, (!&%, !A1!@1)C%, 1, 36G!-%C%(1-!AG!6*+-!9*+, -9R!4, &6+-4, (!C+94&"!V549!-%, (1)!49! &*, 93%, 3"! !

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¹²!ADEB9,!G5X9!

¹³!ADEB9,!GW69!