### !

#### <u>"#\$%&'()\*</u>!

+,-#-!	!	. /01,23453!	\$647/83492!0:!; 466/309<=!; 466/<10>43=!; *!!	?@@@!
; -A-!	!	. /0>0B2!	%<>4:0864 (63949C9/!0:!'/5,60 0B2=!+<3 <d 6<="!%&amp;!&lt;/td"><td>?@@E!</td></d>	?@@E!
F-A-!	!	. /0>0B2!	\$647/83492!0:!G05,/39/8=!*H=!!"#\$"%&'!%("')*!	?@@I!
!				

### <u>&%&#";(%!J"&#"GAK(+!+)A('()\*A!</u>

### !""#\$%&'"&(%)%\*+\$,-&.'/0\$1\*#+&20\*0%&3/#4%+)#05&

#### **6**+%\*)&'''&(%)7'/)#8#1#059&

',/!)::45/!0:!G/3/<85,!3C110893!<6D!:<54>49<9/3!8/3/<85,!D/7/>O1L/69=!180DC59406=! <DL464398<9406=!<6D!50L1>4<65/-!&3!,/<D!0:!9,/!)::45/!0:!G/3/<85,=!(!M08N!<58033!\$647/83492! D47434063!<6D!0::45/3!90!0C4>D!<!5C>9C8/!0:!8/3/<85,!M49,46!<6D!0/206D!&5<D/L45!&::<483=!4L1807/! 9,/!\$647/83492P3!8/3/<85,!46:8<398C59C8/!0080<D>2!D/:46/D!<3!39<:::46B=!39<::!98<4646B=!10>454/3=! 469/86<>!18<5945/3=!:<54>494/3R=!/6B<B/!46!8/3/<85,!L<39/8!1>6646B=!<6D!180L09/!<6D!<D7<65/! ;0695><48\3!>/<D/83,41!80>/!46!\*/M!T/83/2!<3!<!1C0>45!D05908<!8/3/<85,!C647/83492-!&5947494/3!<6D! <8/<3!0:!8/31063404>492!465>CD/U!

- )::45/!0:!G/3/<85,!<6D!A106308/D!+80B8<L3U!+8/V<M<8D!<6D!606V:46<654<>!1039V<M<8D! 3C11089!Q#48/5908!<6D!W!180:/33406<>!39<::RX!
- )::45/!0:!G/3/<85, !%OL 1>4<65/!<6D!G/BC><9082!+80B8<L 3U!%OL 1>4<65/!50L L 499//3!Q(GF=!</li>
  (&% \$ %=!(F%R=!/Y1089!506980>=!506:>459!0:!469/8/39!L<6<B/L/69=!8/3106340>/!506DC59!0:!
  8/3/<85,=!8/3/<85,!469/B8492=!8/3/<85,!L43506DC59!<>>/B<94063=!Q#48/5908!<6D!Z!180:/33406<>!
  39<::=!<6D!E!39<:::13/<85,/3!46!180B8/33RX!</li>
- G/3/<85, !#/7/>01L/69X!
- +0>452! [ 84946B!:08!9, /!\$ 647/83492P3!8/3/<85, !<6D!3106308/D!180B8<L!/69/81843/X!
- J4L49/D!3C0L433406!50L1/9494063X!
- AC11089! \$ 647/83492!1/83066/>!M49, !<11>45<94063!:08!/Y98<LC8<>!:C6D46B=!:08!/Y<L1>/! M08N46B!M49, !6/M!<11>45<693!C106!8/\C/39=!<33439<65/!M49, !463949C9406<>!D<9<!<33/L0>2=! 18074D46B!18/V8/74/M3!0:!180103<>!50L106/693!C106!8/\C/39X!<6D!18/1<846B!>/99/83!0:! 463949C9406<>!3C11089X!
- +8/1<846B!60L46<9406!>/99/83!<6D!3C1108946B!L<9/84<3!:08!:<5C>92!8/3/<85,/83!:08!/Y9/86<>! :/>OM3,413!3C5,!<3!9,/!A>0<6!G/3/<85,!]/>OM3,41=!%<86/B4/!%08108<9406!]/>OM3,41=!; ; 008/!(67/6908!]/>OM3,41=!&><6!'-![<9/8L<6!&M<8D=!/95X!
- (69/86<>!G/3/<85,=!A5,0><83,41=!<6D!%8/<947/!&5947494/3!A//D!.8<693!+80B8<L!
- \$647/83492!\$6D/8B8<DCD<9/!G/3/<85,!+4>09!+80B8<L!QA1846B!EIE^RX!

• \$647/83492VM4D/!

• J/<D!<C9,08!0:!\$647/83492P3!3C55/33:C>!<11>45<9406!90!9,/!14>09!\*(K!"6B<B/L/69!<6D! &55/33!:08!G/3/<85,V&5947/!(63949C94063!180B8<L

G/18/3/69!9,/!%0>>/B/!06!.8<DC<9/!A5,00>! [ 08N46B!.80C1!06!9,/!G0>/3! <6D!G/31063404>494/3!0:!.8<DC<9/!+80B8<L!%008D46<9083e#05908<>!+80B8<L! #48/59083X!

o G/18/3/69!9,/!%0>>/B/!06!9,/!\$647/83492!

d47<84CL!Q?!#48/5908=!?!&64L<>!%<8/!'/5,6454<6=!?VE!39CD/69!M08N/83=!<6D! <>>!8/3/<85,/83RX! %0L1C9/8!)1/8<94063!:08!G/3/<85,!<6D!"DC5<9406!QE!180:/33406<>!39<::RX! G/3/<85,!B8//6,0C3/X 

- o +8/3/69/8=! . 8<CD<9/!&33439<69! ) 84/69<9406=! ', /! . 8<DC<9/!A5,00>!
- o +<6/>439!<6D!BC/39!31/<N/8!:08!9, /!%/69/8!:08!&D74346B!<6D!A9CD/69! '8<63494063! b#43507/8c!+<6/>3!:08!\$6D/5><8/D!]8/3, L/6!</pre>
- <u>\$647/83492!J/<D/83,41!<6D!+80:/33406<>!A9<:::!G/58C49L/69!</u>
  - A/<85, !%OLL499//!%, <48!:08!%O>/B/!>/<D/83, 41!103494063!<6D!N/2!39<::!</li>
    103494063!465>CD46B!9, /!%A&; !&33439<69!#/<6=!.8<693!<6D!%0698<593!</li>
    A1/54<>439=!.8<693!<6D!+80\_/593!A1/54<>439=!<6D!d47<84CL!#48/5908X!</li>
  - A/<85, !%0LL499//!; /L0/8!:08!(6<CBC8<>!#48/5908!0:!9, /!%A&; !A9CD/69!
    AC55/33!%/69/8!<6D!493!&5<D/L45!&D743083X!</li>
  - A/<85,!%OLL499//!L/L0/8!:08!\$647/83492VM4D/!>/<D/83,41!103494063!<6D!N/2!</li>
    39<::!103494063!465>CD46B!&33054<9/!#/<6!0:!9,/!J408<82=!A'"; !]<54×494/3!</li>
    #48/5908!Q\$647/83492!]<54×494/3RX!&33439<69!d45/!+8/34D/69!:08!)55C1<9406<?!</li>
    A<:/92=!"674806L/69!A/8745/3!<6D!F403<:/92!Q\$647/83492!]<54×494/3RX!#48/5908!</li>
    0:!; /5,<645<!A/8745/3!Q\$647/83492!]<54×494/3RX!J<008<9082!%06980>3!
    '5,6454<6!Q\$647/83492!]<54×494/3RX!.8<69!&550C6946B!A1/54<439!Q]46<65/!<6D!</li>
    '8/<3C82R-!</li>

. \*: '+&6\$0#4#0#%)&\*/@&6\$\$';71#),;%/0)&\*)&6))'\$#\*0%&A%\*/9&

- G/D/34B6/D!"674806L/69<>!A54/65/!<6D!; <6<B/L/69!D05908<>!<33439<69!:C6D46B!L0D/>3! 90!4658/<3/!9,/!6CL0/8!0:!39CD/693!3C11089/D!1/8!2/<8X!
- (6!50>><008<9406!M49, !%A&; !FCDB/9!; <6<B/8=!8/D/34B6/D!%A&; P3!6/M!:<5C>92!39<89\C1! 5039!5/69/83!90!:<54>4<9/!<550C69!L<6<B/L/69!<6D!398/<L>46/!:435<>!2/<8!5>03/\0C93\!
- (6!50>><008<9406!M49, !. 8<69!&550C6946B!<6D!KCL<6!G/30C85/3=!8/D/34B6/D!<6D!<4L1>/L/69/D!<!3CLL/8!3<><82!8/\C/39!<6D!<11807<1805/33!46! [08ND<2!]46<65/! 30:9M<8/X!</li>
- G/D/34B6/D!9,/!%A&; !5C8845C>CL!50LL499//!90!4658/<3/!:8/\C/652!0:!L//946B3!0:! /63C8/!94L/>2!1805/3346B!0:!5C8845C>CL!180103<>3X!
- ]<54×49<9/D!9, /!<5\C4349406!0:!h!iE; !46!L<\_08!8/3/<85, !/\C41L/69!02!<3343946B!%A&; ! 8/3/<85, /83!M49, !9, /!5<149<>!1805C8/L/69!1805/33=!50VM84946B!<6D!/D4946B!?f!30>/!30C85/!
   <6D!346B>/!30C85/!\_C394:45<94063=!<6D!M08N46B!M49, !\$ 647/83492!]<54×494/3!90!18/1<8/!31<5/3!</li>
   :08!/\C41L/69!4639<>>9406=!465>CD46BU!K<6D, />D! j V8<2!]>C08/3/65/!31/5980L/9/8=!430901/!
   8<940!L<33!31/5980L/9/8=!8/3/<85, VB8<D/!:>C08/35/65/!L45803501/=!C>98<!1/8:08L<65/!</li>
   ×4\C4D!5, 80L<90B8<1, !L<33!31/5980L/9/8=!LC>94L0D<>!50><008<947/!80009!3239/L=!3/9!0:!</li>
   39CD/69V>/7/>!:>C08/35/69!L45803501/3=!><008<9082!<64L<!/li>

K <>>!? !<6D!E !:>0083=!G45, <8D306!??W!Q9/L108<82!1, 23453!8/3/<85, !><0!DC846B! 8/607<9406R=!G45, <8D306!K <>>!^Ef!Q:08!6/M!/\C41L/69R=!G(%K!^EW!Q:08!6/M!/\C41L/69R=! %>07/!G0<D! . 8//6,0C3/!Q/674806L/69<>!506980>3!C1B8<D/3=! ; /30503L!<8/<=!G ) !M<9/8! 8/239/LR=!A54/65/!K <>>!^?kV^EE=!% "JA!?Ik!Q:08!6/M!/\C41L/69R=!% "JA!3C49/!ZE?!Q:08!6/M! \C41L/69!<6D!/39<O>43,46B!D/D45<9/D!M08N31<5/3!:08!D4::/8/69!921/3!O:!O40,<`<8D0C3! L<9/84<>3R-!!

- #/7/>01/D!<6D!4L1>/L/69/D!LC>94V2/<8!3M46B!31<5/!<6D!3908<B/!31<5/3!1>63!90! 464L4`/!46398C59406!<6D!8/3/<85,!D43C194063!DC846B!8/607<94063X!
- **(5**!50>><008<9406!M49, !\$ 647/83492!]<54>494/3=!18/1<8/D!3C55/33:C>!180103<::08!<!A'"; ! :<54>494/3!L<6<B/8!10349406!<6D!3/8745/!50698<59!OCDB/9!:08!1/8L<6/69!/\C41L/69!Q:CL/! ,00D3=!G) !M<9/8!3239/L3=!<C905><7/3=!50>D!800L3=!/674806L/69<!5,<L0/83RX!
- 03/V0C9!0: !<!:4/>D!39<9406!DC846B!9, /!%074D!1<6D/L45=!465>CD46B!50L18/, /6347/!
  7/69082!0:!1, 2345
  :<54>494/3=!/\C41L/69!L<9/84<3!<6D!3C11>4/3X!A/8746B!<3!9/L108<2!</li>
  C1/874308!:08!% [&!<6D!&] '!180:/33406<>!39<::!C694>!6/M!\_00!<334B6L/693!M49, 46!9, /!</li>
  \$647/83492!M/8/!:46
  \*(601:&] '!180:/33406
  :<16694>!6/M!\_00!<334B6L/693!M49, 46!9, /!</li>
  \$647/83492!M/8/!:46
  :<6<B46B!:46</li>
  :<16694>!6/M!\_00!
  :<180B8<L3=!<6D!1<246B!8/L<4646B!04>>3!<6D!</li>
  :<00023!M</li>
  :<011<</li>
  :<180B8<L3=!<6D!1<</li>
  :<2468B!8/L<4646B!04>>3!<6D!</li>
  :<01023!M</li>
  :<011<</li>
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  :<011<</li>
  :<011</li>
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- \UTf(5) 500050(:4) 0. 22(<) 0. 2(008<) 0. 2(9) 0. 2(4) \*99, \UT!#9406!(/) 0. 2(8-) ]TJETQq0. 24000. 248. 39

# . \*: '+&\*\$\$ '; 71#), ; %/0)&\*)&<#4\*+#B; &A#+%\$0'+9&

- %0>><008<9/D!M49, !\$ 647/83492!]<54>494/3!90!/39<0>43, !3/8745/!50698<593!<6D!8/BC><8! 18/7/69<947/!L<469/6<65/!:08!d47<84CL!/\C41L/69!Q/674806L/69<>!L06490846B!3239/L=! 5<B/!M<3, /8=!<C905><7/3=!<6D!5<B/!M<9/846B!3239/LRX!
- (6!50>>>008<9406!M49, !:08L/8!<6D!5C88/69!d47<84CL!D48/59083!<6D!\$647/83492!]<54>494/3=!
  D/34B6/D!<6D!4L1>/L/69/D!E!1,<3/3!0:!d47<84CL!C1B8<D/3!Q743406!1<6/>3=!4L1807/D!
  >4B,946B!506980>3=!4L1807/D!<48!/Y5,<6B/3!46!,0>D46B!800L3=!4L1807/D!/674806L/69<>!
  506980>3R!<6D!3/87/D!<3!180\_/59!>4<306!C694>!6/M!#48/59083!M/8/!,48/DX!
- +0469!1/8306!:08!<!3C55/33:C>=!C6<660C65/D!\$A#&!4631/59406!0:!9,/!d47<84CL!46!A1846B! EIE?-!

# **6**+%\*)&'''&+%)7'/)#8#1#059&

- G/58C49L/69!0:!6/M!39CD/693!<6D!6/M!D05908<>!:<5C>92!L/L0/83X!
- %,<48!0:!9,/!+80B8<L!&DL4334063!%0LL499//X!
- A9CD/69!0600<8D46B=!50C83/M08N!<D743/L/69=!46:08L<>!D/B8//!<CD493=!<6D!<DL464398<9406! 0:!L4>/3906/!<5947494/3!05<6D4D<52!/Y<L3=!180103<!D/:/63/=!D433/89<9406!D/:/63/RX!
- "DC5<946B!6/M!D05908<!:<5C>92!06!180B8<L!L4>/3906/3X!10>454/3=!1805/DC8/3=!<6D!</li>
  /Y1/59<94063!:08!5<6D4D<52!/Y<L3=!180103<!D/:/63/3=!<6D!:46<!D433/89<9406D!D/:/63/X!</li>
  /DC5<946B!6/M!180B8<L!:<5C>92!06!180B8<L=!%0>>/B/=!<6D!\$647/83492!8/30C85/3!90!3C11089!</li>
  B8<DC<9/!39CD/693X!</li>
- &>>05<9406!<6D!<DL464398<9406!0:!D05908<>!<33439<693,413X!
- &DL464398<9406!0:!9, /!<66C<>!D05908<>!:<5C>92!<11>45<9406!1805/33X!+8074D6B!:4839!>/7/>!0:! 8/74/M!0:!6/M!<6D!8/6/M<>!<11>45<94063X!
- '8<5N46B!D05908<!:<5C>92!/6B<B/L/69!M49, !D433/89<9406!<D743/L/69!<6D!50LLC645<946B! M49, !9, /!#/<6!8/B<8D46B!180B8<L!:<5C>92!/>4B404>492!:08!8/<334B6/D!94L/X!
- G/18/3/69!9, /!%0>>/B/!<6D!D05908<>!180B8<L!D48/59083!06! . 8<DC<9/!A5,00>!9<3N!:085/3-!

## !

# . \*: '+&\*\$\$ '; 71#), ; %/0)&\*)&A '\$0 '+\*1&=+'?+\*; &A#+%\$0 '+9&

- G/OC4>9!98C39=!/L10M/8/D!<6D!8/V/6B<B/D!180B8<L!39CD/693=!D05908<>!:<5C>92=!<6D!9,/! 180B8<L!&DL4334063!%0LL499//!:0>>0M46B!<6!<08C19!>/<D/83,41!98<6349406X!
- %06DC59/D!180B8<L!<CD493!<6D!46D474DC<>!L//946B3!M49, !<>!39CD/693!90!/63C8/!<M<8/6/33!</li>
  0:!<6D!18/1<8<9406!:08!180B8<L!L4>/3906/3=!<6D!90!8/74/M!<55C8<52!0:!98<63:/8!58/D493!<6D!</li>
  50C83/!3C03949C94063!<6D!3, /1, /8D!98<63<594063!9, 80CB, !. 8<DC<9/!A5, 00>!<6D!G/B4398<8!</li>
  8/74/M!<6D!<11807<X!</li>
- (658/<3/D!/::454/652!46!C3/!0:!D05908<!<33439<693,41!8/30C85/3!90!4658/<3/!9,/!6CLO/8!0:! :C>>V94L/!39CD/693!3C11089/D!1/8!2/<8!<6D!18074D/!1<894<>!9C49406!3C11089!90!1<89V94L/! 39CD/693X!
- G/D/34B6/D! "& "A!k@I!%0>>0\C4CL!46! "674806L/69<!; <6<B/L/69!90!/6B<B/!180B8<L!</li>
  D05908<!:<5C>92=!080<D/6!3/L46<8!901453=!<6D!46394>>!354/65/!50LLC645<9406!3N4>>3!:08!
  +, #!<6D!; A!39CD/69!<99/6D//3X!</li>
- G/D/34B6/D! "& "A!1@f!<6D! "& "A!1@W!QG/3/<85, !+80\_/59!(! a !((=!8/31/5947/>2R!90!46394>>! :0C6D<9406<>!8/3/<85, !<6D!50LLC645<9406!3N4>>3!<6D!5<8//8!/Y1>08<9406-!

AC039<694<>>2!8/743/D!9, /!180B8<L!M/0349/!90!465>CD/!46:08L<9406!06!180B8<L!L4>/3906/3!
 :08!009, !39CD/693!<6D!:<5C>92!L/69083=!>46N3!90!.8<DC<9/!A5,00>!46:08L<9406!<6D!</li>
 <DL464398<947/!:08L3=!46:08L<9406!06!8/3/<85, !5>C39/83=!<6D!6/M3!06!:<5C>92!<6D!39CD/69!</li>
 B8<693!<6D!1C0>45<94063-!!</li>

**6**+%\*)&'''&+%)7'/)#8#1#059&

- +8074D/!>/<D/83,41!<6D!743406!:08!9,/!#/1<89L/69P3!<5<D/L45!180B8<L3=!5C8845C>CL=!<6D! 8/3/<85,!/69/81843/X!
- )7/83//!50C83/!35,/DC>46B!<6D!39<:::46B!46!50>><008<9406!M49,!9,/!&33054<9/!%,<48X!
- )7/83//!(6398C59406<!A/8745/!G/108946B!46!50>><008<9406!M49,!9,/!&33054<9/!%,<48X!
- A9CD/69!8/58C4946B!9,80CB, !8/18/3/6946B!9, /!#/1<89L/69!<9!)1/6!K0C3/3=!&55/19/D! A9CD/69!#<23=!L<\_08!:<483=!<6D!0C98/<5,!90!8/B406<>!463949C94063X!
- (6494<>!<D74346B!<6D!0600<8D46B!0:!6/M!:4839V2/<8!39CD/693!<6D!98<63:/8!39CD/693!DC846B! \$647/83492!084/69<9406!/7/693X!
- ) 7/834B,9!0:!D/1<89L/69<!39CD/69!3/8745/3!<6D!39CD/69!3C55/33!<5947494/3!465>CD46B!
  3C1/8743406!0:!180B8<L!<D743083X!L<\_08!<6D!L4608!D43507/82!4670>746B!"<89,!<6D!</li>
  "674806L/69<:!A9CD4/3!180B8<L3X!<3343946B!39CD/693!M49,!8/B4398<9406!1/8L493=!58/D49!</li>
  <D\_C39L/693=!5,<6B/!0:!L<\_08=!5,<6B/!0:!L4608=!<6D!<11>45<94063!90!50L1>/9/!50C83/3!<9!</li>
  <609, /8!463949C9406X!5066/5946B!39CD/693!M49,!:<5C>92!L/69083!:08!46D/1/6D/69!39CD4/3!<6D!</li>
  5<13906/!/Y1/84/65/3X!</li>
- &DL464398<9406!0:!kV@!<66C<>!39CD/69!35,0><83,413!<6D!<M<8D3X!
- G/3/<85, !:<54>49<9406!9, 80CB, !<D705<946B!:08!180:/33406<>!39<::!90!L<6<B/!L<\_08!8/3/<85, ! 46398CL/69<9406!<6D!98<46!6/M!C3/83=!C346B!D/1<89L/69!(#%!:C6D3!:08!18/7/69<947/! L<469/6<65/!<6D!8/1<483=!1805C8/L/69!0:!8/3/<85, !30:9M<8/!Q&85. (A=!; <9><OR=!<6D!C346B! (#%!:C6D3!90!3C11089!:<5C>92!<6D!39CD/69!98<7/>>90!180:/33406<>!506:/8/65/3X!
- •

• +/83066/>!L<6<B/L/69=!465>CD46B!3C1/8743406!<6D!/7<C<9406!0:!?^V?k!:C>>V94L/!&]'!

%06DC59/D!<!50L1>/9/!8/74/M!0:!46398C59406<>!8/>9/D!/Y1/63/3!:08!5063CL<0>/3=! /\C41L/69!3/874546B=!/\C41L/69!8/1><5/L/69!>4:/!525>/3=!30:9M<8/!>45/63/3=!<6D!:4/>D!9841! /Y1/6/3!90!D/9/8L46/!0C8!<66C<>!OCDB/9!8/\C/39X!

- (6494<9/D!L<6D<9082!<D74346B!:08!<>>!C6D/8B8<DC<9/!L<\_083!0:8/3, L/6!9, 80CB, !3/6408R!</li>
  /7/82!3/L/39/8!9, 80CB, !B8<DC<9406=!<DL46439/8/D!9, 80CB, !C3/!0:!<!8/B4398<9406!+(\*!50D/!</li>
  18074D/D!DC846B!<D74346B!L//946B3X!</li>
- A/87/D!<3!#/1<89L/69!>4<4306!90!#/<6P3!)::45/!DC846B!DC846B!1><6646B=!D/34B6=!</li>
  506398C59406!0:!9, /!?Ik=III!3\-!:9!%/69/8!:08!"674806L/69<>!<6D!J4:/!A54/65/3!Q% "JAR!</li>
  OC4>D46B=!18074D46B!D/34B6!3CBB/394063!<6D!8/18/3/6946B!/6DVC3/8!6//D3!:08!9/<5,46B!</li>
  31<5/3!<6D!8/3/<85,!><008<908/3X!</li>

8/50B64<sup>×</sup>/!0C939<6D46B!\_C64083!<6D!3/64083!46!0C8!6/M>2!58/<9/D!AC39<46<04>492!A54/65/! 180B8<L3=!50L1<8<0>/!90!/Y43946B!39CD/69!8/50B6494063!46!"<89, !<6D! "674806L/69<>! A54/65/!<6D! . /0B81, 2X!

•

- %0>>>CO8<947/!G/3/<85,U!J46N46B!; <846/!<6D!'/88/3984<>!A/D4L/69<82!"74D/65/!:08!+>40V1>/43905/6/! d<84<O4>492!0:![/DD/>>!"LO<2L/69!<6D!&69<85945!+/6463C<!.>54<9406=!A-!K/LL46B! 0%0>CLO4<!\$647/83492=!>/<D!+(R=!(-!F<4>/2=!;-!o<1>6=!F-!o/43>46B=!A-!F8<5,:/>D!Q;0695><48! +(R=!'-![4>>4<L3=!A-!)P%066/>>=!F-!G/4>2=!J-!'<CY/=!T-![<8605N=!"-'-!G<30C82=!i?@?=1@I=! \*A]!)::45/!0:!+0><8!+80B8<L3=!I@eI?eE?!90!I1e^?eEIEW-!
- ) 11089C6492!; //93!(6607<9406!%, <>>/6B/!Q); (%R=!+, -.\*&/%01234%05"!67-\$7\$#%1&&\*889% 2\*8\*", &5%"\$)%3\$#"#\*!\*\$/\!%C>947<946B!G/3/<85, =!(6607<9406!<6D!'</69-!!J-!F4>>46B3! Q%A&; !+(R=!A-!F8<5,:/>D!Q50V+(R=!\*/M!T/83/2!)::45/!0:!9, /!A/58/9<82!0:!K4B, /8!"DC5<9406=! if?I=kkf=!Ike?EeE?!n!Ike?eEZ-!
- %0>><008<947/!G/3/<85,U! ' 8<546B!50<>!<3,!30>4D3!46!9,/!/674806L/69V!(L1>45<94063!:08!>06BV9/8L! 5069<L46<9406!0:!9,/!<\C<945!/503239/L=!&-!d/6B03,!Q#CN/!\$647/83492=!>/<D!+(R=!"-!%0M<6! Q&11<><5,4<6!A9<9/!\$647/83492!+(R=!<6D!A-!F8<5,:/>D!Q3C0V<M<8D!

\$1B8<D/!0:!9,/!)1945<>!(%+!<9!;0695><48!A9<9/!\$647/83492=!;-!.08846B!Q+-(-R!M49,!;A\$!50

50>><008<9083!o-!J4C=!<6D!&-!+80N01/6N0=!\*<9406<>!A54/65/!]0C6D<9406=!"<89, !A239/L3! K439082=!IkeI?eIZV!IWe^IeIW-!

- +/980>0B45!<6D! "Y1/84L/69~! "7~C<9406!0:!<6!(B6/0C3!) 84B46!:08!; <B6/945!&60L<4/3!06!; <83=! T-!K<LL/8!Q+(R=!M49, !A-!F8<5, :/>D!Q50V+(=!:C6D/D!<3!9/L108<82!^VL069, !/L1>02//!0:! \$647-! K<M<44=!T<6C<82V; <85, !EII^R=!<6D!50>><008<9083!; -!GC9, /8:08D!<6D!F-!; 03NOM49`=! \*<9406<>!&/806<C9453!<6D!A1<5/!&DL464398<9406=!; <83!#<9<!&6<>2343!+80B8<L=!i?f=III!90! ), 40!A9<9/!0:!ikI=III!LC>94V463949C9406!909<=!@e?eEIIE!n!1e^?eEIIZ-!
- &6!4B6/0C3!084B46!:08!; <894<6!L<B6/945!<60L<4/3t!T-!K<LL/8!Q+-(-R=!A-!F8<5,:/>D!Q+(R=!<6D! 50>><008<9083!F-!; 03N0M49`=!; -!GC9,/8:08D=!(63949C9/!:08!G05N!; <B6/943L!d434946B! ]/>>0M3,41=!?IeIE-!
- " 39<0>43,46B!9,/!398<94B8<1,2!0:!B><54B/645!0/D:08L3!06!9,/!%,CN5,4!F08D/8><6D=!&85945!)5/<6=! 90!8/506398C59!9,/!,439082!0:!+>/43905/6/!&85945!45/!3,/>7/3=!J-!+0>2<N!Q+(R=!A-!F8<5,:/>D!Q50V +(R!<6D!50>><008<9083!#-!#<802!<6D!T-!F435,0:=!i?^E=IkW!90!)A\$!0:!iEfE=III!LC>94V 463949C9406!909<=!^eI?eIEVEeE1eIZ=!\*<9406<!A54/65/!]0C6D<9406!&85945!\*<9C8<>!A54/65/3-!
- 'OM<8D3!9,/!#/7/>O1L/69!0:!; <B6/945!+807/6<65/!'8<5/83!46!&69<85945!.><54<V; <846/! A/D4L/69U!&!+4>O9!A9CD2!46!9,/!&69<85945!+/6463C><=!A-!F8<5,:/>D=!Q+(R=!ikI=?@I=!keI?eIEV We^IeIZ=!\*<9406<>!A54/65/!]OC6D<9406!)::45/!0:!+0><8!+80B8<L3-!
- \$ AV]8<65/!%0>><008<947/!G/3/<85,U!K4B,V8/30>C9406!CV5,<66/>!L<B6/945!39CD2!0:!J<9/! r C<9/86<82!3/D4L/69!508/3!:80L!9,/!"<39!&69<85945!;<8B46=!A-!F8<5,:/>D=!Q+(R!M49,! 50>><008<9083!%-!J<\_!<6D!%<9,/846/!0433/>=!i?k=WII=!??eI?eI?V?Ie^IeI^=!\*<9406<>!A54/65/! ]0C6D<9406!(69/86<9406<>!+80B8<L3!Q\*A]V(\* 'R! [ /39/86!"C801/!#4743406-!
- K4B, !G/30>C9406! r C<9/86<82! .><54<>!K439082!<6D!+<>/0/674806L/693!0:!9, /!"<39!&69<85945!

+-(-=!M49, !A-o-!F<6/8\_//!Q50V+(R=!iEI=kEk=!WeI?e@1VEeE1eII=!T0469!) 5/<60B8<1,45!(63949C94063! \$649/D!A9<9/3!A54/65/!AC11089!+80B8<L-!

K0>05/6/!1<>/0180DC5947492!34B6<>!0:!9, /!&69<85945!50<39<>!05/<6U!>46N<B/3!<L06B!9, /!3C6=! <9L031, /8/=!05/<6=!3/<!45/!<6D!0409<=!"-!#0L<5N!Q>/<D!+(R!M49, !50>><008<9083!A-!F8<5, :/>D=! &-!J/7/69/8=!G-!; C88<2=!'-!T<6/5/N=!A-!(3, L<6=!T-!o/66/99=!A49/!A/>/59406!:08!) 5/<6! #84>46B!+80B8<L!J/B!?k1-!

!

G"A"&G%K!.G&\*'A!&\*#!G"%).\*('()\*A!')!A'\$#"\*'!; "\*'""A!

- K<33<6!o<33,4:!QA9CD/69!<C9,08R!<6D!A-!F8<5,:/>D!Q&DL464398<947/!+(!<6D!:<5C>92!L/6908R-! d/69C8/[/>!'V'/<L!+80B8<L!A9<B/!?!.8<69=!ifIII=!IkeI?eEE!90!I^eE?eE^-!
- G45, <8D!T<L/3!QA9CD/69!<C9, 08R=!b\$3/!0:!\*<947/!\*/M!T/83/2!+><693!90!G/L07/!; /9<3!:80L! %069<L46<9/D!A04>3c=!./0>0B45<>!A054/92!0:!&L/845<!A9C/69!G/3/<85,!.8<69=!&M<8D/D!M49,! )C939<6D46B!; /69406=!iEEfI=!EI?W-!A-!F8<5,:/>DU!G/3/<85,!L/6908!
- F8/6D<6!G/4>2=!; <39/83!G/3/<85, !&M<8D=!%0>>/B/!0:!A54/65/!<6D!; <9, /L<9453!&M<8D3!0:! "Y5/>>/65/=!; 0695><48!A9<9/!\$647/83492=!EI?^-!A-!F8<5, :/>DU!G/3/<85, !L/6908!
- %<9,>//6!Q#</R!#0,/892=!)C939<6D46B!.8<DC<9/!A9CD/69!46!./0354/65/!&M<8D=!;0695><48!A9<9/! \$647/83492=!EII@-!A-!F8<5,:/>DU!G/3/<85,!L/6908-!
- ; 0>>2!GO34B=!b#/:4646B!9,/!+807/6<65/!%,<8<59/8439453!0:! [ /DD/>>!A/<!<6D!\*089,/<39/86! &69<85945!+/6463C><!A/D4L/69U!&!; C>94V180Y2!&1180<5,=c!

#### <u>G"A"&G%K!A\$+"Gd(A()\*=!; "\*')G(\*.=!&\*#!)'K"G!'G&(\*(\*.!</u>

+-8/)-&/-,"(%2\*8\*", &5\*,8%

#8-!%, 843946<!d/8, <B/6=!EIE^!90!18/3/69!

!

*J*5\*878%''\$)%:788\*,/''/-\$%1)>78\*\*8%

 $. 46 <! r C4u06/3 =! ; -\& -=! " 674806L/69 <! A54/65/3! ; <2!EIIW!Q60M! + 80_/59!A54/69439! < 9!\&85 < D43R! \\ #8 -! % < 9, >//6!Q # <>/R! #0, /892 =! ; -A -! . /0354/65/=! ; <2!EII@!Q60M! & 33054 < 9/! + 80:/3308!0:! \\ \label{eq:action}$ 

+80:/33406<>!+8<5945/!<6D!#48/5908!0:!(608B<645!&6<>2343!]<54>492=!") KA(=!GC9B/83! \$647/83492R!

o/66/9,!o<51/80M3N4!T8-=!; -A-=!./0354/65/=!&CBC39!EII@!Q6OM!A/6408!./0>0B439!<9! [A+! "674806L/69!<6D!(6:8<398C59C8/!\$A&R!

#<74D!%COLO=!; -A-=!. /0354/65/=!&CBC39!EI?I!060M!. /0>0B439!<9!J0C43!F/8B/8!. 80C1R! %<8>!\*<99/8=!; -A-!. /0354/65/=!&CBC39!EI??!060M!A54/69439!<9!'/98<'/5, %<6D45/!]<C>N=!; -A-!46!. /0354/65/=!; <2!EII@!060M!oV?E!354/65/!/DC5<908!46!\*TR!

- #8-!#<6!K<C1970B/>=!; -A-!46!./0354/65/=!; <2!EI?I!Q60M!(6398C59406<>!&33054<9/!+80:/3308=! \$647-!K0C3906R!
- #8-!; />433<!K<63/6=!+,-#-=!"674806L/69<>!; <6<B/L/69=!&CBC39!EI?W=!; A!EI??=!Q60M!<D\_C659! 46398C5908!<9!; 0695><48!A9<9/!\$647/834928!
- TC3946!oC>45N=!; -A-!46!. /0354/65/=!; <2!EI?E!060M!oV?E!354/65/!/DC5<908!46!\*TR!

"845!A066/6M<D=!; -A-!46!./0354/65/=!&CBC39!EI?^!060M!oV?E!354/65/!/DC5<908!46!\*TR!

- o<9,>//6!; 4>>/8=!; -A-!46!./0354/65/=!; <2!EI?Z!
- T<2!+<9/>:; -A-!46!./0354/65/=!; <2!EI?Z!060M!<9!&"%); R!
- T/3345<!G03/60/8B=!; -A-!46!./0354/65/=!; <2!EI?Z!060M!./0>0B439!<9!. "(!%063C>9<693=!(65-R!)
- #8-!AC3, <69!A46B, =!+, -#-=!"674806L/69~!; <6<B/L/69=!; <2!EI?f!Q60M!&33439<69!d45/!+8/34D/69! 0:!#<9<!a!&6<>29453!) A=!A06<9<!A0:9M<8/=!\$A&R!
- &184>! o />>2=! ; -A-!46! "<89, !<6D! "674806L/69<>!A54/65/=! ; <2!EI ?k!Q60M!<9! \$-A-!&8L2!%0813!0:! "6B46//83R!
- #8-!\*<9<4/!A,/8M00D=!+,-#-=!"674806L/69<>!;<6<B/L/69=!;<2!EI?k!
- T/664:/8!J4B,9=!; -A-!46!"<89,!<6D!"674806L/69<!A54/65/=!&CBC39!EI?k!Q60M!<9!."(!%063C>9<693R!
- #8-!; 495, />>!%><2=!; -A-!46!"<89, !<6D!"674806L/69<>!A54/65/=!&CBC39!EI?k!Q60M!J<0!; <6<B/8!<9! &C3946!+/<2!A9<9/!\$647/83492R!
- #8-!&>>4306!J/11=!; -A-!46!"<89, !<6D!"674806L/69<>!A54/65/=!; <2!EI?1!Q60M!+039D05908<>! G/3/<85, /8!<9!\$647-!d48B464<R!
- ; <99, /M!A<6D/:C8=! ; -A-!46! "<89, !<6D! " 674806L/69<:A54/65/=!&CBC39!EI?@!Q60M! \* G%A! . /0>0B45<:A/8745/3! \$ 649!Q . A \$ R!A9<9/! . /0>0B439!:08! \* H=! \* T=!<6D!+&R-!

- ; />433<!A5,><6N=! ; -&-!46! "674806L/69<!A9CD4/3=!EIIk-! " \* dGVf^?=!b#/7/>0146B!\$649!+><63!:08! "674806L/69<!%063/87<652=c!50L1>/9/D!ACLL/8!EIIW-!
- #//1<!A,<,=!;-A-!46!./0354/65/=!.") Af@E!b+><6/9<82!;<B6/943L=c!A1846B!EI?E!
- #//1<!A,<,=!; -A-!46!./0354/65/=!"&"Af^f!b./01,23453=c!] <>>!EI?^!
- T<2!+<9/>:; -A-!46!./0354/65/=!"&"Af@@=!]<>>!EI?^!bA"; !<6D! j V8<2!L4580<6<>2343!0:!%08D4/849/! 46!\*/M!T/83/2!K4B,><6D3!; /9<1/>49/3-c!
- AC3, <69!A46B, =!+, -#-!46! "674806L/69<!; <6<B/L/69=! "& "Af@@=!ACLL/8!EI?Z!bA"; !<6D! j V8<2!; 4580<6<2343-c!
- G45,<8D!T<L/3=!; A!46!AC39<46<04>492!A54/65/=!"&"A!k@E-!

%

*E/5*\*, %*G*, ") ' "/\*%2\*8\*", &*5*%? '*6*\*, >787-\$%

- ; />433<!K<63/6=!B8<69!:C6D/D! . &=!@e?I!n!We??=!(806!0Y4D/!98<5/8!D/7/>01L/69!46!9,/!G033!A/<=! &69<85945<!
- ; 45, </>!; <8/35, =!. 0>D:<80!]/>>0M=!@e?^!n!?Ee?^=!(806!0Y4D/!<33/L0>B/3!46!3/D4L/69!:80L!9,/! [,4>>63!(5/!A98/<L!060M!./031<94<)!&6<>239!<9!%06946/69<>!; <1146B!%063C>9<693R!
- #<74D!A, <81/=!B8<69!:C6D/D! . &=!@e?^!n!?Ee?^=! ; <B6/945!<6D!B/05, /L45<>!<6<2343!0:!L<846/! 3/D4L/693!Q6OM! "674806L/69<! . /0>0B439!<9!&L04/69! "674806L/69<=!(65-R!

1

A (A )\*, #, ") ' "/\*\*I (A )\*6\*(A )\*(A )/2/') B\*+, -.\*&/8\*1 )>78\*)!

- ; 45,</>!%<554<1C094=!F-A-!46!./0354/65/=!EIIf-!(67/394B<946B!+09/694<>!30C85/!0:!949<64CLV845,! '49<60L<B6/949/!46!+<\L/8!#//1!L4DD>/!K0>05/6/!3/D4L/69=!; 0695><48!A9<9/!\$647/83492=! 50L1>/9/D!]<>>!EIIf-!
- ', 0L<3!A-!%><2906=!F-A-!46!./0354/65/!M49,!"<89,!A54/65/!'/<5,46B!%/894:45<9406=!EI?E=! &6<>2343!0:!9,/!B/05,/L45<>!34B6<9C8/3!0:!d465/66/3!F<2!50<39>46/!3/D4L/693=!%0L1>/9/D! A1846B!EI?E-!
- %,843901,/8!%066<>>>06=!F-A-!46!./0354/65/=!"::/593!0:!:08/39!:48/3!06!304>!L<B6/945!L46/8<>! <33/L0><B/3=!31846B!EI?E-!
- (3<L<8!%089/3=!F-A-!46!AC39<46<04>492!A54/65/!46!180B8/33=!+807/6<65/!'8<5/83!0:!+<>/0¥45/! 398/<L3=![/DD/>>!A/<=!&69<85945<!
- #<74D!%COL0=!F-A-!5<6D4D<9/!46!./0354/65/-!; <B6/945!1801/894/3!0:!"<39!&69<85945!D8013906/3! <6D!D8/D8/!L<9/84<3=!; 0695><48!A9<9/!\$647/83492=!]<>>!EII1-!
- T<306!#<8>/2=!F-A-!46!./0354/65/=!.8<46V34`/!D/1/6D/69!B/05,/L43982!0:!6089,/<39/86!&69<85945! +/6463C><!K0>05/6/!3/D4L/69=!;0695><48!A9<9/!\$647/83492=!] <>>!EII@VA1846B!EI??-!!
- A9/1,<64/!#C>B<8=!F-A-!46!./0354/65/3!EIIk=!A0C9,/86!(>>46043!\$647/83492=!F<59/84<>!;<B6/949/!46! &69<85945!D//1V3/<!3/D4L/69t!%0L1>/9/D!]<>>!EIIW-!
- o<9,>//6!)99/63=!F-A-!46!./0354/65/=!EI?f=!A5<6646B!">/59806!;458035012!<6D!jV8<2! ;4580<6<>2343=!A1846B!EI?f-!
- TC>4<6<!+46`06=!F-A-!46!F40>0B2=!EII1-!; <B6/945!+801/894/3!0:!9, /!& \* #G(JJ!; 5; C8D0!(5/!A, />:! D84>>!508/=!; 0695><48!A9<9/!\$647/83492=!50L1>/9/D!A1846B!EII1-!

# //1 < !A, <, = !F-A-!46! . /0354/65/!46!180B8/33 = !+ < /03/5C > 8!7 < 84 < 9406! < 6D!8/ > 947/!1 < /0469/63492!

 $?\& "\$\$7\$\#\%3(*\&/, -\$\%@7\&, -8\&-6B\%"\$)\% \setminus X, "B\%@7\&, -"\$"(B878\%J, "7\$7\$\#\%)$ 

#8-!

!y; 5%<896/2=!o-=!K<LL/8=!T-"-=!A,/<=!'-=!.4<5,/994=!'-=!"7~C<946B!9,/!80>/!0:! 949<60L<B6/949/!46!0C00>/!6C5>/<9406U!G05N!L<B6/945!D/9/59406!<6D!5,<8<59/84`<9406!0:! 6<60>49/3!<6D!C>98<V6<60>49/3!46!8,20>49/!1CL45/!<6D!0034D4<6!:80L!.><33!; 0C69<46=! %<4:0864<=!G\*-&5\*!78/,B%G\*-65B87&8%G\*-8B8/\*!8=!,9913UeeD04-08Be?I-?IE@eEIE^.%I??^^W;!

y; 5%<896/2=!o-=!K<LL/8=!T-"-=!A,/<=!'-=! 6<6035</!949<60L<B6/949/!46!0C00>/!6C5>/<9406!74<!607/>!<11>45<94063!0:!L<B6/945!<6<>23/3=% G\*-&5\*!78/,B%G\*-65B87&8%G\*-8B8/\*!8%,9913UeeD04-08Be?I-?IE@eEIE^.%I??^^1;%

[ <6B=!%V

[ /0/8=! ; -!"-=!F<4>/2=!(-=!K/LL46B=!A-G-=! ; <8903=!H- ; -=!xG/4>2=!F- '-=!G06B/=! '-!&-=! ! [ 4>>4<L3=! '-=!G<2L0=! ; -!"-=!F/>9=!A- '-=!AL4N=!J-=!d0B/>=!K-=!+/5N=!d-=!J-!&8L08/5,9=! J-=!%<B/=!%-=!%<8D4>>0=!]-.-=!#C=!s-=!]<C9,=!.-=!]0BM4>>=!%-T-=!.<854<=! ; -=!.<863M089,2=! ; -=! y.>|D/8=!&-=!y.C49<8D=! ; -=!.C9\_<,8=! ; -=!K/86z6D/`V&>L/4D<=!(-=!yK0/L=!]-A-=!yKM<6B=!T-!V K-=!y(4`CN<=! ; -=!o<90=!H-=!yo/6>//=!F-=!)P%066/>>=!A-=!+v8/`=!J-]-=!A/N4=!)-=!A9/7/63=!J-=! '<CY/=!J-=!y'841<9,4=!A-=! [ <8605N=!T-=!s,/6B=!j-=!EIEE-!&6941,<3/D!DC39!D/10349406!<6D! 180DC5947492!46!9,/!&69<85945!s06/!07/8!?-f!L4>>406!2/<83=!H"/',\*%0-!!'\$7&"/7-\$89|?^!Q?R=! ?V?1=!,9913UeeD04-08Be?I-?I^1e3Z?ZWkVIEEVE@WZEVf-%

y+/8/48<=!+-A=!7<6!D/!]>4/8D9=!'-=!K/LL46B=!A-G-=!K<LL06D=!A-T=!oC,6=!. ! #0,/892=!%-=!<6D!K4>>/608<6D-!%-V#-=!EI?1-!./05,/L45<>!:46B/8184693!0:!B><54<>2!/80D/D! 0/D805N!:80L![/39!&69<85945<U!D/9849<!9,/8L05,8060>0B2=!8<D40B/645!430901/!3239/L<9453! <6D!98<5/!/>/L/69!B/05,/L43982!46!J<9/!K0>05/6/!B><54<>VL<846/!3/D4L/693=c!3",/5X?&7\*\$&\*% 2\*>7\*O8=!?1Z=!EIZVE^E=!,9913UeeD04-08Be?I-?I?We\_-<83548/7-EI?1-IZ-I??-!

y o 28L<64D0C=!&-=!yd<DL<6=!o-=!(3, L<6=!A-=!J/7/69/8=!&-=! =!#0L<5N=!"-=!EI?1-! J<9/!K0>05/6/!05/<60B8<1,45!<6D!5>4L<945!7<84<04>492!46!9,/!+/83/7/8<65/!#84:9=! 6089,M/39/86! [ /DD/>>!A/<!0<3/D!06!0/69,45!:08<L464:/8<!<6D!D4<90L3=!@",7\$\*% @7&, -6"(\*-\$/-(-#B=!,9913UeeD04-08Be?I-?I?We\_-L<8L4580-EI?1-I^-II?-!

%0M<6=!"-&-=!y"11/8306=!"-"-=!A/8<LC8=!o-%-=!

- +4/85/=!"-=!K/LL46B=!A-G-=![4>>4<L3=!'-=!7<6!D/!]>4/8D9=!'-=!',0L306=!A-\*-=!G/46/83=!+-[-=! ./,8/>3=!.-"-=! -=!.0>D39/46=!A-J-=!EI?Z=!&!50L1<84306!0:!D/9849<>!\$V+0! `48506=!ZI&&e^@&&!,0860>/6D/=!<6D!ZI&&e^@&&!040949/!<B/3!46!L<846/!3/D4L/693!0::!"<39! &69<85945<U!4L1>45<94063!:08!9,/!B/0>0B2!0:!3C0B><54<>!9/88<463!<6D!1807/6<65/!39CD4/3=! 3",/5%?&7\*\$&\*%2 \*>7\*08=!?^1=!?fW ?k1=!\_9913UeeD04-08Be?I-?I?We -/<83548/7-EI?Z-I1-I?I;!
- G/0/350=! ; -=!#0L<5N=!"-=!sBC8=!]-=!J<704/=!%-=!J/7/69/8=!&-=! =! [4>L099=!d-=! K<7/8306=!.-=!'8C::/8=! ; -=!A5<L003=!'-=!AL49,=!T-=!+/949=!"-=!EI?Z=!F0C6D<82!%06D49406!0:! .80C6D46B!J46/!A239/L3!F/6/<9,!J<83/6!F!(5/!A,/>:=!&69<85945<=!+8408!90!%0>><13/=! ?&7\*\$&\*=!^Zf=!60-!WEIE=!?^fZV?^f1=!D04!?I-??EWe354/65/-?EfWW@k-!
- $$\begin{split} F &< 50 = ! . ! A5 , </:/8 = !T- ; ! < 6D! J \&G(AA \& !B80C1 ! QF <> 50 = ! . ! \\ & ! D/F < 9439 = ! ; ! \# 0L < 5N = ! \\ & " ! . 08D06 = ! \& ! K < 8 < 6 = ! ' ! K / 684 / 9 = ! T-V + ! KCO / 8 = ! F ! (3, L < 6 = ! A = ! yT / 06B = ! A = ! o 46B = ! ; = ! \\ J < 704 / = ! \% ! T < 6! \# 07 / 8 = ! \% ! J / 7 / 69 / 8 = ! \& = ! ; 5\% 08L 45N = ! ; = ! + / 9949 = ! " = ! A5 < L003 = ! ' = ! AL49 , = ! \% = ! \\ ; 03 > / 2V ' , 0L 1306 = ! " = ! ' , 0L 1306 = ! J = ! ' 8C :: / 8 = ! ; = ! d / 86 / 9 = ! ; = ! HC = ! o = ! s < B < 80D607 = ! d R = ! \\ EI ? ^ = ! ' / 88 / 3984 <>! / Y103C8 / V < B / ! 8 / 508D ! 0 : ! KO > 05 / 6 / ! 45 / ! 3 , / 9! < 6D! 45 / ! 3 , /> : ! 5 , < 6B / ! 46! 9 , /! \\ 6089 , / < 39! \& 69 < 85945! + / 6463C >< ! J ' '' / * , $ ", B \% ? & 7 * & 3 \% 2 > 7 * O8 = ! f @ = ! ? I ? V ? ? ? ! \\ \end{split}$$

-=!x+46`06=!T-=!x#<8>/2=!T-=!A<B60994=!J-=!oC,6=!.-=!]>0846D0=!]-=![4>306=!.-=! y),6/43/8=!%-=!;064/6=!#-=!<6D!T03/1,=!J-=!EI?^-! F0M>/3=!T-&-=!K<LL/8=!T-"-=!<6D!

%0M<6=!"-=! -=!+0M/>>=!G-=!yA5,00>:4/>D=!A-=!EIIW=!;46/8<>VL<86/945!1801/894/3!0:! K0>05/6/!B><54L<846/!3/D4L/69!:80L!A0C9,/86!%0<39<>!&><3N<=!0"\$")7"\$%L-',\$"(%-&3",/5% ?&7\*\$&\*8=!Z^Q@R=!?EW@V?E1E-!

 $y \ [ <6B=! s -=!\%0M < 6=! " -\& -=!A/8 < LC8=! o -=! \#M2/8=! . -A-=!y \ [ 4>306=!T-\%-=!y o <85, /8=G-=! <6D! d /6B03, =!& -=!EIEE-! J /B <52!0:!50 <!<3, !5069 < L46 <9406!46! ><N/!3/D4L/693! <6D! <4L1>45 <94063!:08!18/7 <>/69!843N3!90! < C <945!/503239/L3=!0# <9<3/9R=! ; <B6/9453!(6:08L<9406! %0630894CL!0; <B(%R=!D04U):I-kE11edZe; & .(%eE1?kW-%$ 

1

- y; 5%<896/2=!o-=!K<LL/8=!T-"-=!A,/<=!'-=! 80>/!0:!6<6035</!949<60L<B6/949/!46!0C00>/!6C5>/<9406!74<!607/>!<11>45<94063!0:!L<B6/945! <6<>23/3!Q#<9<3/9R=!; <B6/9453!(6:08L<9406!%0630894CL!Q; <B(%R=! D04U?I-kE11edZe; &. (%eEII?@-!

[/0/8=!;-!"-=!F<4>/2=!(-=!K/LL46B=!A-G-=!;<8903=!H-;-=!xG/4>>2=!F-'-=!G06B/=!'-!&-=!

. C20D0=!H-=!&5906=! . - # -=!

xG/4>>2=!F-=!'<CY/=!J-=! !.C9\_<,8=!; -=!J//=!F-=!K/86z6D/`V&>L/4D<=!(-=!K/LL46B=! A-G-=!F<4>/2=!(-=!s,/6B=!j-=![/0/8=!; -=!G<2L0=!; -"-=![4>>4<L3=!'-=!EIE^-!&!B/05,/L45<>! L/5,<643L!:08!g?I!L!0::3/93!0:!L<B6/945!8/7/83<3!46:/88/D!:80L!9,/!50L1<84306!0:!9M0! A5094<!A/<!D84>>!349/3!Q() #+!"Y1/D49406!^1ER=!]<>!EIE^!; //946B!0:!9,/!&L/845<6! ./01,2345<>!\$6406=!#/5/L0/8!??V?f=!EIE^=!A<6!]8<654350=!%&-!

y+/<8306=! [-]=!%0M<6=!"-&-=! [<6B=!s-=! -=!K4>>=!G-=!d/6B03,=!&-=!A/8<LC8=!o-%-=! K<B/L<6=!A-T-=!EIE^-!%,<8<59/84`<9406!0:!L081,0>0B2=!5,/L43982=!<6D!L<B6/945! 3C35/19404>492!0:!50<>!<3,!<6D!<11>45<94063!:08!98<5N46B!9,/!98<631089!46!<\C<945! /674806L/693=!./0>0B45<>!A054/92!0:!&L/845<!.A&!%066/593!EIE^=!)5900/8!?fV?1=! +49930C8B,=!+&=!EIE^-!

- y]0Y=!.-%-=!%0M<6=!"-&-=![<6B=!s-=! 34`/!7<84<9406!<6D!B/05,/L45<!34B6<9C8/3!0:!50<!<3,!D/10349406!46!K250!J<N/=!\*%-! ./0>0B45<!A054/92!0:!&L/845<!.A&!%066/593!EIE^=!)5900/8!?fV?1=!+49930C8B,=!+&=!EIE^-!
- y [ <6B=!s-=!%0M<6=!"-=!A/8<LC8=!o-=! -=!d/6B03,=!&-=!EIE^-!G<D406C5>AD/3!:08! 98<546B!D439840C9406!<6D!,439082!0:!50<>!<3,!5069<L46<9406!46!><N/!3/D4L/69=!./0>0B45<>! A054/92!0:!&L/845<!A0C9,/<39/86e\*089,/<39/86!A/59406!;//946B=!?kn?@!;<85,!EIE^=! G/3906=!d48B464<=!\$A&-!
- y; 5%<896/2=!o-\*-=!K<LL/8=!T-"-=!A,/<=!'-=! #/9/5946B!6LV35<>/!949<60L<B6/949/!46!,4B,!34>45<!8,20>49/!1CL45/!M49,!607/>!<11>45<94063!0:! 805N!L<B6/943L-=!(&d%"(!A54/694:45!&33/L0>2=!T<6C<82!^I!90!]/08C<82!^=!EIE^=!G0908C<=! \*/M!s/<>6D-!

 $\begin{aligned} &:= !x J40L < 6 VG03, <>= !) -: !x K0DB /= !\& -: !x #0, /892 = !\& -: !x *45, 0>3 V) P * /4>= !A -: !xG/4>>2 = !\\ F-'-=!' < CY/=!J-=![ /0/8=!; -: !G < 2 L0=!; -"-=! + /5N=!d - J -=! [ 4>>4 < L3=!'-=!F < 4>/2=!(-=!K/LL46B=! A -G-=!) P%066/>>=!A-=!o <1><6=!; -G-=!J45, 9=!o-=! < 6D!() #+! "Y1/D49406!^1E!A54/694393=!EIEE-! J < 9/! +>/43905/6/!&9L031, /8/V) 5/<6V(5/!A, //9!%0C1>46B!46!9, /!A5094<!A/<!! $ 68<7/>46B!9, /! ; <B6/945!AC35/19404>492V(5/!%08/!#C39!%088><9406=!] <>!; //946B!0:!9, /!&L/845<6! ... /01, 2345<! $ 6406=! # /5/L0/8!?EV?W=!EIEE=! &, 45<B0=!(J-$ 

%,8439=!&-T-=!F4/8L<6=!+-G-=!'4306=!TVJ=!F><8D=!+VK=! ;<3980=!K-=!',0L<3=!"-0-=!&BC4><8=!T-;-=!%<:://=!;-=!#<,>VT/63/6=!#-=!#/9,4/8=!#-+-=! ]03D45N=!T-%-=!K/LL46B=!A-G-=!K4D2=!&-T-=!0<345=!0-=!06C9`=!+-%-=!+/8D84<>=!\*-=!+/9//9=! #-;-=!G499/60C8=!'-;-=!A5,</:/8=!T-=!D/!A0C`<=!T-.-G-=!A9/::/63/6=!T-+-=!<6D!A9/4B=!"-T-=!EIEE-! ',/!3C0B><54<!3/D4L/69!:80L!9,/!%<L1!%/69C82!45/!508/U!<!C64\C/!7\$X87/'!1</D54L<9/! <85,47/!:80L!6089,M/39!.8//6><6D=!]<)!;//946B!0:!9,/!&L/845<6!./01,2345<!\$6406=! #/5/L0/8!?EV?W=!EIEE=!%,45<B0=!(J-

!%0M<6=!"-&-=!y [ <6B=!s-=!y o<85, /8=!G-=!y [ 4>306=!T-%-=!A/8<LC8=!o-%-=!d/6B03,=! &-=!EIEE-!; <86/945!5, <8<59/84`<9406!0:!6<9C8<>!<6D!<69, 8010B/645!]/V0Y4D/!<33/L0>B/3!46! \*089, !%<80>46<!><N/3U! '00>3!:08!D/9/59406!0:!50<>!50L0C39406!8/34DC<>3=!./0>0B45<!A054/92! 0:!&L/845<!. A&!%066/593!EIEE=!#/67/8=!%) =! ) 5900/8!EIEE-!

%0M<6=!"-&-=!y [ <6B=!s-=!y [ 4>306=!T-%-=!yo<85, /8=!G-=!A/8<LC8=!o-%-=! d/6B03,=! &-=!EIEE-!J<5C39846/!3/D4L/69!508/3!8/508D!<6!/70>746B!,439082!0:!50<>!<3, !5069<L46<9406!46! :80L!(5/0/8B!&>>/2!06!9,/!8,29,L3!0:!&69<85945!5>4L<9/!DC846B!9,/!+>40V+>/43905/6/=! ./0>0B45<!A054/92!0:!&L/845<!. A&!EIEI!%066/593!)6>46/=!)5900/8!EWVE?=!EIEI-!

$$\begin{split} & : xG/4 \gg 2 = !F - ' - = ! ' < CY/= !J - = ! [ /0/8 = !; - " - = !G < 2 L 0 = !; - = ! + /5 N = !d - = ! [ 4 \gg 4 < L 3 = ! ' - = ! \\ & F < 4 > /2 = !(- = !K/LL46B = !A - G - = !) P\% 066 / \gg = !A - = !G06B/= ! ' -& -= ! yJ//= !F - = ! o < 1 > 6 = !; - = !J45, 9 = ! o - = ! \\ & () # + ! "Y1/D49406!^{1E!A54/694393 = ! ', /!A5094 < !A < !; <B6/945!AC35/19404 > 492!G/508DU! % 0C1 > 46B! \\ & 0 : !9, /! # //1!) 5/<6! < 6D! & 9L031, /8/t! & L/845 < 6! . /01, 2345 < ! $ 6406! ] <>!; //946B = ! \\ # /5/L0/8!kV? = !EIEI - ! \end{split}$$

$$\begin{split} & : xG/4 \gg 2 = !F - ' - = ! ' < CY/= !J - = ! [ /0/8 = !; - " - = !G < 2 L 0 = !; - = ! + /5 N = !d - = ! [ 4 \gg 4 < L 3 = ! ' - = ! \\ & F < 4 > /2 = !(- = !K/LL46B = !A - G - = !) P\% 066 / \gg = !A - = !G06B / = ! ' -& -= !yJ / / = !F - = ! o < 1 \gg 6 = !; - = !J45, 9 = ! o - = ! \\ & () # + ! "Y1/D49406!^{1E!A54/694393 = ! ', /!A5094 < !A < !; <B6/945!AC35/19404 > 492!G/508DU! \% 0C1 > 46B! \\ & 0 : !9, /! # //1!) 5/<6! < 6D! & 9L031, /8/t! . /0 > 0B45 < !A054/92!0 : !& L/845 <! . A & !EIEI! \% 066/593! \\ & ) 6 > 46/=!) 5900/8!EWVE ? = !EIEI - ! \end{split}$$

y '841<9,4=!A=! '4M<84=! ; -=! [ /0/8=! ; -!G<2L0=! ; -=!+/5N=!d-=! [ 4>>4<L3=! '-=!%<8D4>>0=! ]-..=!#C=!s-=! ]<C9,=!..=!y.>C/D/8=!&-=!y(4`CN<=! ; -=!) P%0666/>>=!A==!G06B/=! '-=!<6D!9,/! y; 5%<896/2=!o-\*-=!K<LL/8=!T-"-=!A,/<=!'-=!.4<5,/994=!'-=! !(67/394B<946B! 949<60L<B6/949/!<OC6D<65/!46!8,20>49/!1CL45/=!.0>D35,L4D9!d489C<>!EIEI=!E?VEW!TC6/=! EIEI-!

o<90=!H-=!A/N4=!)-=!(4`CN<=!; -=! [ /0/8=!; -=!G<2L0=!; -=!+/5N=!d-=! [ 4>>4<L3=!'-=!<6D!9, /! =!+8/>4L46<82!8/3C>93!0:!() #+!"Y1-!^1EU!(5/0/8B!&>>/2!<6D!

[ /DD/>>!A/<=!&69<85945!+/6463C><-! . /0>0B45<>!A054/92!0:!&L/845<!EI?k!&66C<>! ; //946B=! ) 5900/8!EEVEf=!EI?k=!A/<99>/=! [ <3,46B906-!

 $\label{eq:stable} $$ \frac{|x\%4806/!\&-:![4\%4<L3:!'-:!K/LL46B:|A-:!J45,9:!o-:!EI?k-!./05,/L45<!<6D! L46/8<0B45<!34B6<9C8/3!0:!9,8//!45/!398/<L3!46!9,/![/DD/>:!A/<!''LO<2L/69:!&69<85945<:!./0>0B45<!A054/92!0:!&L/845<!EI?k!&66C<!;//946B:!)5900/8!EEVEf:!EI?k:!A/<99>:![<3,46B906-!$ 

xT<L/3=!G-T-=! =!EI?k=!K/<72!; /9~!&55CLC><9406!&>06B!9,/!+~43<D/3!(69/839<9/! +<8NM<2=!\*T-!./0>0B45~!A054/92!0:!&L/845<!&66C~!; //946B=!)5900/8!EEVEf=!EI?k=! A/<99>/=! [ <3,46B906-!

yF80M6=!%-G-=!. 84::49, 3=!; -J-=!yK<63/6=!; -J-=!y o 2>/=!. -=!y. /95, =!A-T-=!. 4>>4N46=!#-+-=! =!#<A4>7<=!; -=!+<8D4=!G-!<6D!A/0/945, =!; -=!+8/, 4390845!, CL<6!5C>9C8<!3, 4:93! 46!9, /!L4DV&9><6945U!"74D/65/!0:!5>4L<9/!46:>C/65/!06!<85, <45!5C>9C8/3!46!\*/M!T/83/2! 46:/88/D!:80L!<!?f=III!2/<8!><N/!3/D4L/69!508/=!. /0>0B45<!A054/92!0:!&L/845<!T0469!fE6D! \*089, /<39/86!&66C<!A/59406!e!f?39!\*089, V%/698<!&66C<!A/59406!; //946B!V!EI?k=!; <85, ! ?@nE?=!EI?k=!+49930C8B, =!+&-!

!y] 4839=!"-=!K<LL/8=!T-=!A9/M<89=!A-'-=!K<6N46=!; -=!A1<C>D46B=!#-o-=!FOM>/3=!T-=!yA98<C33=!F-"-=![49,/83=!&-=!<6D!]/460/8B=!T-=!EI?W-!; <B6/945!+801/894/3!0:!A269,/945!; <83! .C3/7!%8<9/8!F<3<93=!] >>!EI?W!; //946B!0:!9,/!&L/845<6!./01,2345<>!\$6406=!A<6! ]8<654350=!%&-!

x%4806/=!&-=! -=!x%089/3=!(-=!xd/8,<B/6=!%-=! [4>>4<L3=!'-=!<6D!K/LL46B=!A-=!EI?W-! +807/6<65/!'8<546B!0:!..>54<>!A/D4L/69!:80L!9,/!]0C6D<9406=!&5<D/L2=!<6D!G/507/82!(5/! A98/<L3=! [/DD/>:A/<=!&69<85945<=!]<>!EI?W!;//946B!0:!9,/!&L/845<6!../01,2345<>!\$6406=! A<6!]8<654350=!%&-!

=!&-=!#0L<5N=!"-=!F8<5,:/>D=!A-=!(3,L<6=!A-=![/>>6/8=!T-=!EI?W=!G/508D3!0:!45/!8/98/<9U! D4<90LVO<3/D!L/33<B/3!:80L!9,/!&69<85945!506946/69<>!L<8B46=!\_T %I\$/\*,\$"/7-\$"(% O-\$<\*,\*\$&\*%-\$%+"(\*-&\*"\$-#,"65B=!\$98/5,9=!\*/9,/8><6D3-!

- A, /<=! '-=!K<LL/8=!T-=!<6D! -=!EI?W-!FC00>/!6C5>/<9406!46!L<BL<3U!<!D0L46<69>2! ,/9/80B/6/0C3!1805/33t!]<>>!EI?W!; //946B!0:!9, /!&L/845<6!./01,2345<>!\$6406=!A<6! ]8<654350=!%&-!
- [ 4>>4<L3=! '-=!K/LL46B=!A-G-=!F03M/>>=!F-=!J45,9=!o-=!y&B8403=!J-=! -=!7<6!D/8! ]>4/8D9=! '-=!oC,6=!.-=!EI?W-\$346B!3/D4L/69!1807/6<65/!90!39CD2!45/!398/<L3!46!9,/! [ /DD/>>! A/<!/L0<2L/69!0:!&69<85945<=!]<>>!EI?W! ; //946B!0:!9,/!&L/845<6!./01,2345<>!\$6406=!A<6! ]8<654350=!%&-!
- A/8<LC8:!o-=!%OM<6=!"-&-=!F8<5,:/>D=!A-=!K<B/L<6=!A-=!<6D!">>4306=!; [-=!EI?W-!"::/593!0:! DOM6398/<L!98<631089!06!1,2345<>!<6D!5,/L45<!1801/849/3!0:!50<>!<3,!f!2/<83!<:9/8!9,/! o46B3906!'d&!314>>-!./0>0B45<>!A054/92!0:!&L/845<!&66C<>!; //946B!46!#/67/8=!%0>08<D0=! \$A&!n!EI?W-
- y./95,=!A-!T-=!yK<63/6=!o-!.-=!.84::49,3=!;-!J-=! A/0/945,=!;-=!<6D!+<8D4=!G-=!EI?W-!#/B><54<>!5>4L<9/!7<84<04>492!46!6089,/86!\*/M!T/83/2!

46:/8/D!:80L!<!><N/!3/D4L/69!508/=!./0>0B45<!A054/92!0:!&L/845<!\*089,/<39/86!A/59406!V! f?39!&66C<!;//946B=!&>0<62=!\*H=!E?nE^!;<85,!EI?W-

- y. /95, =!A-!T-=!yK<63/6=!o-!.-=!.84::49, 3=!; -!J-=! A/0/945, =!; -=!<6D!+<8D4=!G-=!EI?f-!G/506398C5946B!1<39!5>4L<9/!7<84<04>492!<:9/8!9, /! J<C8/694D/!(5/!A, //9!G/98/<9!46!6089, /86!\*/M!T/83/2!C346B!<!><N/!3/D4L/69!508/=!./0>0B45<>! A054/92!0:!&L/845<!EI?f!&66C<!; //946B=!F<94L08/=!; <82><6D=!\$A&=!?VZ!\*07/L0/8! EI?f-!
- K/LL46B=!A-G-=! -=!%00N=!%-=!J45,9=!o=!+4/85/=!"-!J-=!G/46/83=!+-![-=!',0L306=!A-! \*-=!7<6!D/!]>4/8D9=!'-=!<6D![4>4<L3=!'-=!EI?f-!#/9849<9,8L05,8060>0B2!0:!&69<85945! B><54B/645!3/D4L/693U!(634B,93!4690!1<39!45/!3,//9!0/,<7408!<6D!&69<85945<P3!,4DD/6!B/0>0B2=! ]<>>!;//946B!0:!9,/!./0>0B45<!A054/92!0:!&L/845<=!F<94L08/=!;<82><6D=!\$A&=!?VZ! \*07/L0/8!EI?f-!
- [ 4>>4<L3=! '=!J45,9=!o=!K/LL46B=!A=!oC,6=!.=!7<6!D/!]>4/8D9=! '=!F8<5,:/>D=!A=! '08:394/6=!&=! K4>>/608<6D=!% #=!]>0M/8D/M=!; =!F8<DD05N=!+!QEI?fR!(5/!D26<L453!46!9,/![/DD/>>!A/<! /L0<2L/69!0:!&69<85945<!C346B!3/D4L/69!1807/6<65/-!&.\$!T0469!&33/LO>2=!; 0698/<=! %<6<D<=!^Vk!; <2!EI?f!

# A54/65/3=!TC>2!?^

06!&69<85945!+/6463C><!%>4L<9/!%,<6B/U!%>4L<9/=!(5/=!)5/<63=!<6D!J4:/=!A5,00>!0:!+,2345<>! A54/65/3=!\$%!(8746/=!TC6/!EZVEW=!EII1-!

x # </=!%-=! -=!K/LL46B=!A-=!7<6!D/!]>4/8D9=!'-=!EIII-!'8<546B!&69<85945!(5/VA,//9! 39<04>492!9,80CB,!3/D4L/69!1807/6<65/-!A4BL4!j4!A9CD/69!G/3/<85,!%06:/8/65/=!;<2!^=! EIII=!;0695><48=!\*T-!

J/7/69/8=! &-=! y [ /39=! \*-=! #0L<5N=! "-=! -=! (3, L<6=! A-=! QEIIIR-! #/541, /846B! D4<90LV O<3/D!34B6<>3!0: !B><54<VL<846/!/674806L/693U!5<3/!39CD2!0: !9, /!J<83/6!&!<6D!F!/LO<2L/693=! f !(69/86<9406<>! [ 08N3, 01!06! &69<85945! +/6463C>! %AL<9/!%, <6B/U!%AL<9/=!(5/=! ) 5/<63=! <6D! J4: /=!A5, 00>!0: !+, 2345<!A54/65/3=! \$%!(8746/=!TC6/!EZVEW=!EII1-!

-=!#0L<5N=!"-[-=![4>>L099=!d-=!J/7/69/8=!&-=!(3, L<6=!A-=!QEIIIR-!K0>05/6/!K439082! 0:!9,/!J<83/6 -=!#0L<5N!"-[-=!J/7/69/8=!&-=!y[4>>L099=!d-=!(3,L<6=!A-=!QEIIkR-!\*/M!G/3C>93!<6D! ]C9C8/!(+H!(67/394B<94063!46!K/N9084<!'80CB,=!(66/8!J<83/6VF!"L0<2L/69=!&69<85945! +/6463C><=!]<>>!;//946B!0:!9,/!&L/845<6!./01,2345<>!\$6406=!#/5/L0/8!?IV?Z=!A<6! ]8<654350=!%&-!

- FOM>/3=!T-&-=!K<LL/8=!T-"-=! ; <894<6!F<3<93!<6D!(L1>45<94063!:08!9, /!AC8:<5/!; <B6/94`<9406!0:!; <83=!]<>>!; //946B!0:! 9, /!&L/845<6!. /01, 2345<!\$ 6406=!#/5/L0/8!?IV?Z=!A<6!]8<654350=!%&-!
- y%0Y=!A-"-=!G/46/83=!+-[-=!\*450>/35C=!A-=!',0L306=!A-\*-=!./,8/>3=!.-"-=!K/LL46B=!A-G-=!7<6!D/! ]>4/8D9=!'-=!.0>D39/46=!A-J-=!-=!QEIIkR-!(3090145!<6D!',/8L05,8060>0B45<>! "74D/65/!:08!) 84B46!<6D!"803406!K439082!0:!9,/!.<L0C893/7!;0C69<463=!"<39!&69<85945<=! ]<>>!;//946B!0:!9,/!&L/845<6!./01,2345<>!\$6406=!#/5/L0/8!?IV?Z=!A<6!]8<654350=!%&-!
- y J 43vV+80607039=!&-=!A9V ) 6B/=! . -=!F<8>/99<=!]-=! -=!+0>2<N=!J-=!#<802=!#-=!QEIIkR-! K4B, !G/30>C9406!K0>05/6/!+<>/0L<86/945!A/5C><8!d<84<9406!G/508D3!]80L!9, /! &><3N<6e%, CN5, 4!A/<!F08D/8><6D=!]<>>!; //946B!0:!9, /!&L/845<6! . /01, 2345<>!\$ 6406=! #/5/L0/8!?IV?Z=!A<6!]8<654350=!%&-!

 $\begin{array}{l} -=!K/LL46B=!A-!G-=!7<6!D/!] \\ \label{eq:solution} \\ +=!(0.5) \\ +=!(0.5$ 

- y%0Y=!A-=!K/LL46B=!A-G-=!G/46/83=!+- [ -=! \*450>/35C=!A-=! ' ,0L306=!A- \* -=! . / ,8/>3=! . "-=!7<6!D/! ]>4/8D9=! ' -=! .0>D39/46=!A-J-=! -=!QEIIkR-!#/9849<!<1<949/!<6D!`48506!Q\$V', ReK/! /74D/65/!:08!/<8>2!:08L<9406!<6D!3>0M!/803406!0:!9, /! . <L0C893/7!; 0C69<463=! "<39! &69<85945<=! ) 6>46/!+805//D46B3!0:!9, /!?I !(A& "A=!/D49/D!02!&-!0-!%001/8!<6D!%-!G-! G<2L06D!/9!<-=!\$A . A! ) 1/6V]4>/!G/1089!EIIk=! "Y9/6D/D!&0398<59=!?VZ-!
- #0L<5N=!"-![-=!.-!K<7/8306=!yd-![4>>L099=!&-!J/7/69/8=! =!A-!(3, L<6=!QEIIkR-! A1<94<>!<6D!'/L108<>!#439840C9406!0:!(N<49/!%8239<3!46!&69<85945!.<54<?!;<846/!A/D4L/693=! )6>46/!+805//D46B3!0:!9,/!?I (A&"A!j=!/D49/D!02!&-!o-!%001/8!<6D!%-!G-!G<2L06D!/9!<=! \$A.A!)1/6V]4>/!G/1089!EIIk=!"Y9/6D/D!&0398<59=!?VZ-!
- #0L<5N=!"-[-=!J/7/69/8=!&-=!y[4>>L099=!d-=! ;-=!sBC8=!]-=!+<DL<6=!J-=!.4>0/89=!G==!QEIIkR-!\*/M!L<846/!3/D4L/69!508/!D<9<!3C11089! K0>05/6/!39<04>492!0:!9,/!J<83/6!F!(5/!A,/>:=!)6>46/!+805//D46B3!0:!9,/!?I (A&"A!j=! /D49/D!02!&-!0-!%001/8!<6D!%-!G-!G<2L06D!/9!<>=!\$A.A!)1/6V]4>/!G/1089!EIIk=!"Y9/6D/D! &0398<59=!?VZ-!
- K/LL46B=!A-G-=! --!./,8/>3=!.-=!.0>D39/46=!A-J-=!7<6!D/!]>4/8D9=!'-=!QEIIkR-!"74D/65/! :80L!D/9849<>!,0860>/6D/!ZI&&e^@&8!<6D!`48506!\$V+0!<B/3!:08!9,/!30C85/3!0:!B><54<>! D/103493!46!9,/!+82D`!F<2!8/B406=!)6>46/!+805//D46B3!0:!9,/!?I !(A&"A=!/D49/D!02!&-!o-! %001/8!<6D!%-!G-!G<2L06D!/9!<-=!\$A.A!)1/6V]4>/!G/1089!EIIk=!"Y9/6D/D!&0398<59=!?VZ-!
- s BC8=!]-=!G/0/350=!; -=!#0L<5N=!"-[-=!J/7/69/8=!&-=! -=!y [4>L099=!d-=!QEIIkR-! ./01,2345<>!3C87/2!0:!9,/!9,45N=!/Y1<6D/D!3/D4L/69<82!:4>>!0:!9,/!6/MV0086!%8<6/!:\_08D! Q:08L/8!J<83/6!F!(5/!A,/>:=!&69<85945<R=!)6>46/!+805//D46B3!0:!9,/!?I !(A&"A=!/D49/D!02!&-! o-!%001/8!<6D!%-G-!G<2L06D!/9!<-=!\$A.A!)1/6V]4>/!G/1089!EIIk=!"Y9/6D/D!&0398<59=!?VZ-!

y J43vV+80607039=!&-=!A9V ) 6B/!.-=!+0>2<N!J-=!#<802!#-=! -=!QEIIkR-!+,2345<>!<6D! L<B6/945!1801/894/3!0:!,4B,!8/30>C9406!K0>05/6/!3/D4L/69!508/3!:80L!9,/!%,CN5,4!A/<! L<8B46U!+8/>4L46<82!8/3C>93-!%; ) Ae% . \$e&; A!EIIk!506B8/33=!; <2!E1V!TC6/!?=!A9VT06,\$3=! \*/M:0C6D><6D=!%<6<D<-!

-=!; <6>/2=!+-=! . 08846B=!; -=!G2<6=!+-=!QEIIkR-!%069840C94063!0:!3/D4L/69!1807/6<65/! <6D!3/D4L/69!D4<B/6/343!90!M/39/86!&69<85945!+/6463C><!L<B6/945!180Y2!8/508D3=!A1846B! EIIk!&L/845<6! . /01,2345<>!\$6406!T0469!&33/L0>2=!; <2!EEVEf=!EIIk-!

!7<6!D/!]>4/8D9=!'-=!K/LL46B=!A-=!.0>D39/46=!A-=!G02=!; -=!.08846B=!; -=![4>>4<L3=! '-=!QEIIkR-!'8<546B!+807/6<65/!0:!&69<85945!.><540VL<846/!A/D4L/69!9,80CB,!G<D40B/645! (30901/3=!&8e&8!K0860>/6D/!&B/3=!<6D!FC>N!./05,/L43982=!A1846B!EIIk!&L/845<6! ./01,2345<>!\$6406!T0469!&33/L0>2=!; <2!EEVEf=!EIIk-!

y # C>B<8=!A-=! -=!(3, L<6=!A-=!]/88v=!"-%-=!QEIIkR-!#/9849>=!D4<B/6/945=!08!O<59/84>! 084B46!0:!L<B6/949/!46!3/D4L/69!D84:93!:80L!9,/!M/39/86!&69<85945!+/6463C><=!A1846B!EIIk! &L/845<6!../01,2345>!\$ 6406!T0469!&33/L0>2=!; <2!EEVEf=!EIIk-!

xG034B=!; -T-=! !+<335,4/8=!A-=!.08846B=!; -=!QEIIkR-!#/:4646B!9,/!+807/6<65/! %,<8<59/8439453!O:! [/DD/>>!A/<!<6D!\*089,/<39/86!&69<85945!+/6463C><!A/D4L/69!!!&!LC>94V 180Y2!<1180<5,=!A1846B!EIIk!&L/845<6!./01,2345<>!\$6406!T0469!&33/LO>2=!; <2!EEVEf=! EIIk-! !K<LL/8=!T-=!QEIIWR=!A269,/945!]/V845,!O<3<93!<3!; <83!&6<>OB3U!(L1>45<94063!:08! 9,/!; <83!; <B6/945!&60L<4/3=!k !%06:/8/65/!06!G05N!; <B6/943L=!A<69<!]/=!\*; =!TC6/!EEV Ef=!EIIW-!

!K<LL/8=!T-=!QEIIfR=!A269,/945!]/V845,!O<3<>93!<3!; <83!<6<>OB3U!; 46/8<>!L<B6/945! <6D!8/L<6/65/!1801/894/3=!*3* - 8%*J*, "\$8;%*IGA*=!1WQfER=!]<>!; //9-!AC11>-=!&O398<59!.+ZE&VIE-!

-=!0433/>=!%-=!J<\_=!%-=!y [ 4>>L09=!d-=!QEIIfR=!'0M<8D3!<!%485CLV&69<85945!K0>05/6/! G/><947/!+<>/0469/63492!%C87/=!*3*-8%*J*, "\$8;%*IGA*=!1WQfER=!]<>>!; //9-!AC11>-=!&O398<59! .+ZZ&VIf-!

x%<554<1C094=!; -=! -=!QEIIfR=!(67/394B<946B!+09/694<>!30C85/!0:!949<64CLV845,! '49<60L<B6/949/!46!+<>L/8!#//1!L4DD>/!K0>05/6/!3/D4L/69=!3-8%J, "\$8;%1GA=!1WQfER=!]<>>! ; //9-!AC11>=!&0398<59!++Z?&VIWEW-!

3/D4L/693!:80L!9,/!; <5-G00/89306!A,/>:=!"<39!&69<85945!; <8B46=!%,<1L<6!%06:/8/65/!06! ',/!G0>/!0:!#4<90L!+80DC59406!<6D!A4!]>CY!<6D!FC84<>!46!9,/!G/BC><9406!0:!.>00<!%25>/3=! +<804N4<=!.8//5/=!A/19/L0/8!EEVE#=!EII^-!

0433/>=!%-=! J<\_=!#0L<5N=!"-[ -=! . 4>0/89=!G-=!(3, L<6=!A-"-=! J/7/69/8=!&-=! %<L/8>/6B,4=!&-=! . /0L<B6/945!1<>/0469/63492!D<946B!0:!K0>05/6/!3/D4L/69<82!8/508D3!:80L! 0/6/<9,!9,/!:08L/8!J<83/6V&!(5/!A,/>:=! j d(!(\* r \$ &!%06B8/33=!G/60=!\*d=!TC>2!EII^-!

 $+0>2<N=! J-=! !#<802=! #-&=:!F435, 0:=!T-=!+, 4>>413=! y J-=! ]/00=! J-&=:!%0<N>/2=!F-T-=! "DM<8D3=!; -K-=!"6B/>3=!T-J-=!EII^<=!; C>>41>/!B><54<>!/803406!06!9, /!%, CN5, 4!F08D/8><6D=! &85945!) 5/<6=!<3!46D45<9/D!02!18/>4L46<82!D<9<!06!3/D4L/69!398<94B8<1, 2!<6D!3/<:>008! L081, 0>0B2-!! j d(!(* r $ &!%06:-=!+80B8<L!M49, !&0398<593=!1-!?@f-!$ 

!K4B,V:4/>D!L<B6/945!3C35/19404>492!<3!<!98<5/8!0:!040B/645!3/D4L/69<9406!525>/3!

EII1! d]^k@!A/<85,!%0LL499//=!d45/!+807039!0:!&5<D/L45!&::<483!<6D!&33/33L/69!

EIIWVEIII! \$647/83492!.8<DC<9/!%0C654>!0%A&;!8/18/3/69<947/R!

EIIW! ; <84/!]8<`//!A5,0><83,41!%0LL499//!

EIIf! +8/3/69/8=! . 8<DC<9/!#/7/>01L/69!%06:/8/65/!

EIIf! ; <84/!]8<`//!A5,0><83,41!%0LL499//!

!

<u>%0>>/B/!0:!A54/65/!<6D!</u>; <9, /L<9453!

EIEE!

	EI?IVEI?^!	&33054<9/!%.	<48=!#/19-!"	<89,!<6D!"674806L	2/69<>!A9CD4/3!0/	'>/59/D!?!9/8LR!
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EI?I! d%V?^@!"&"A!#/1<89L/69!A/58/9<82!A/<85,!%0LL499//!L/L0/8!

EI?I! d ]V?I!"&"A!]<5C>92!A/<85,!%0LL499//!L/L0/8=!"<89,!A239/L3!; 0D/>46B!

EI?IVEI?f! ; A!46!. /0354/65/!. 8<DC<9/!+80B8<L!%008D46<908!

EII@VEI??! %,<48=!#/1<89L/69!+/83066/>!&59406!%0LL499//!

EIIIV

1)>78-, B%F-", )8%WH"/7-\$"(Z%

- EIE?V!EIEf!; /LO/8=!\$649/D!A9<9/3!&D743082!%0LL499//!90!A54/694:45!)5/<6!#84>>46B!Q\$A&%R! <6D!%,<48!0:!A54/65/!%0LLC645<9406!AC050LL499//=!\$A!A54/65/!AC11089!+80B8<L! Q\$AAA+R!
- EIE?! %, <48=!%C8<9084<>!&D743082!F0<8D=!\$A!+0>8!G05N!G/10349082=!), 40!A9<9/!\$647/83492!
- EI?@VEIEI!; /LO/8=!%C8<9084<>!&D743082!F0<8D=!\$A!+0><8!G05N!G/10349082=!),40!A9<9/! \$647/83492!
- EI?fVEI?1!; /L0/8=!+0><8!G/3/<85, !AC050LL499//!:08!9, /!\*<9406<>!A54/65/!]0C6D<9406! . /0354/65/!#48/5908<9/!&D743082!%0LL499//!
- EI?EV?W!;/L0/8=!G/74/M!<6D!&D743082!%0LL499//!QG&%R=!(63949C9/!:08!G05N!;<B6/943L=! \$647/83492!0:!;466/309<!
- EIIWVEIII!; /L0/8=!&69<85945!G/3/<85,!<6D!AC11>2!d/33/>!A54/694:45!&D743082!%0LL499//=! \*<9406~!A54/65/!]0C6D<9406!
- EIIfVEI?W!; /LO/8=!&69<85945!; <846/!. /0>OB2!G/3/<85,!]<54>492!&D743082!%OLL499//=!]0.2(/)0.2(/)0.2(/)0.2(/)

- o \*&A&!"<89,!<6D!A1<5/!A54/65/!]/>>0M3,41!!
- o ; <83!#<9<!&6<>2343!+80B8<L!0; #&+R!
- +039D05908<>!]/>>0M3,41!180B8<L!
- o A0><8!A239/L! [ 08N46B3!+80B8<L!QAA [ R!

!

# <u>\*<9406</u><<u>1854</u>/65/<u>10C6D</u><<u>9406</u><u>8</u><u>1</u><u>R</u>!

- \* A]!+<6/>3!Q?WR!
  - )::45/!0:!+0><8!+80B8<L3!())++R!

- %`/5,!\*<9406<>!A54/65/!]0C6D<9406!
- (69/B8<9/D!) 5/<6!#84>>46B!+80B8<L!Q() #+R!A49/!A/>/59406!+80B8<L!
- (38</>!A54/65/!]0C6D<9406!
- \*/M!s/<><6D!&69<85945!G/3/<85,!(63949C9/!
- AM433!" 'KVsC845, !G/3/<85, !%0LL433406!
- \$649/D!046BD0L!\*<9C8<>!"674806L/69!G/3/<85,!%0C654>!Q\*"G%R!

!

### *G*\*-(-#7&"(%?-&7\*/B%-<%1 ! \*,7&"%

- EIEf! A/33406!) 8B<64`/8!<6D!%, <48=!EIEf!\*089, /<39!G/B406<>!. A&!; //946B!'/5, 645<>!A/33406! '?^!bG/506398C5946B!"674806L/69<!%, <6B/!:80L!; <846/=!J<5C39846/=!<6D!'/88/3984<>! A/D4L/69<82!G/508D3c!Q35, /DC>/DR!
- EIEZVEIEk!!./0>0B45<>!A054/92!0:!&L/845<!A9CD/69!G/3/<85,!.8<693!%0LL499//!
- EI?W! G/3/<85,!; /6908!:08!../0>0B45<>!A054/92!0:!&L/845<!A9CD/69!G/3/<85,!.8<69!8/5414/69=! G45,<8D!T<L/3=!&M<8D/D!M49,!)C939<6D46B!; /69406-!
- EII1! ) C939<6D46B!G/74/M/8=!G\*-(-#7&"(%?-&7\*/B%-<%1 !\*,7&"%F'((\*/7\$!
- EIIW! A/33406!) 8B<64`/8!<6D!%, <48=!'/5, 645<>!A/33406!'?IE!b&9L031, /8/n(5/!A, //9n) 5/<6! (69/8<594063U!; 0D/86!) 03/87<94063!<6D!K4390845<>!(69/818/9<94063=c!./0>0B45<>!A054/92!0:! &L/845<=!+, 4><D/>1, 4<=!+&=!) 59-!EEVEf=!EIIW-!
- ?@@@V18/3/69U!; <6C358419!8/74/M3U!G\*-(-#B9%G\*-(-#7&"(%?-&7\*/B%-<%1 !\*,7&"%F'((\*/7\$9!G\*-(-#7&"(% ?-&7\*/B%-<%1 !\*,7&"%?6\*&7"(%+"6\*,8!
- ?@@1!90!18/3/69U!!; /LO/8!Q5C88/69>2!J4:/94L/!; /LO/8R!

#### %

*I\$8/7/'/\**%<-,%2-&*Y*%@''#*\$\*/78!*%*A\$7>\*,87/B*%-%@7*\$\$\*8-/''*%

EI?EVEI?W!; /LO/8=!G/74/M!<6D!&D743082!%0LL499//!QG&%R!

EIIW! (6749/D!31/<N/8=!k !%06:/8/65/!06!G05N!; <B6/943L=!A<69<!]/=!\*; =!TC6/!EEVEf=!EIIW-!

- EIIW! A/33406!5067/6/8=!k !%06:/8/65/!06!G05N!; <B6/943L=!A<69<!]/=!\*; =!TC6/!EEVEf=!EIIW-!
- ?@@W! ',48D!%06:/8/65/!06!G05N!; <B6/943L!<6D!"674806L/69<!; <B6/943L=!A<69<!]/=!\*; !
- ?@@f! A/D4L/69<82!F40VB/0VL<B6/943L! [ 08N3,01=!\$647-!; 466/309<!

?@@Z! A/506D!%06:/8/65/!06!G05N!; <B6/943L!<6D!"674806L/69~!; <B6/943L=!A<69<!]/=!\*;!

@ ''\$ '8&,76/\2\*>7\*08\<-,\E/5\*,\+,-<\*887-\$''(\?-&7\*/7\*8\\8\*\*\''C->\*\<-,\1 ! \*,7&''\$\G\*-65B87&''(\ A\$7-\$\''\$)\G\*-(-#7&''(\?-&7\*/B\-<\1 ! \*,7&''\.-',\$''(8Z\

- *1 !* \*,7&"\$%@7\$\*,"(-#78/!0;46/8<>0B45<>!A054/92!0:!&L/845<R!
- $G^{*}(-\#7\&''(\mathbb{N}? \&7^{*}/B\mathbb{N} (\mathbb{N}D \$)) \$\mathbb{N}@ \$ \#, "65\mathbb{N}?*, 7^{*}8!0 . /0>0B45 < :A054/92!0:!J06D06R!$
- *G*\*-65B87&"(%*L*-', \$"(%*I*\$/\*, \$"/7-\$"(!QG02<>!&398060L45<>!A054/92R!
- *E*&\*"\$-#, "65B%Q', /!) 5/<60B8<1, 2!A054/92R!
- +,-&\*\*)7\$#8%-<%/5\*%H"/7-\$"(%1&")\*!B%-<%?&7\*\$&\*8%Q\*<9406<>!&5<D/L2!0:!A54/65/3R!
- ?/')7"%G\*-65B87Y"!Q(63949C9/!0:!./01,23453!0:!9,/!&5<D/L2!0:!A54/65/3!0:!9,/!%`/5,!</li>
  G/1CO>45R!

%

- EIIZ! (6749/D!31/<N/8=! [ 08N3,01!06!9,/!]C9C8/!"Y1<63406!0:!9,/!&69<85945!G/3/<85,!]<54>492=!!
- ! ! ]>084D<!A9<9/!\$647/83492=! '<>>,<33//=!]J=!&CBC39!?EV?^=!ETIZ-!
- EIIE! (6749/D!1<894541<69=!& #G(JJ!\$A!A54/65/! [ 08N3,01=!&184>!?@VE?=!J4650>6=!\*"!
- EIIE! &69<85945!; <846/!./0>0B2!<6D!./01,23453!G/3/<85,!d/33/>!+><6646B![08N3,01=!; <85,!!
- ! ! E^VEZ=! [ <3,46B906=!#-%-!
- ?@@k! &69<85945!(5/V; <8B46!"70>C9406!()&\*'(; "R! [ 08N3,01=!K00<89=!'<3L<64<!
- ?@@k! +<\L/8!J06BV9/8L!"50>0B45<>!G/3/<85,!QJ'"GR! [ 08N3,01=!\$647-!%<4:0864<=!A<69<! F<80<8<!

!

### <u>+</u>\$FJ(%!"#\$%&'() \*!&\*#!)\$'G"&%K!

- EIEI! TCDB/=!A9-!%<334<6!A5,00>!; 4DD>/!A5,00>!A'"; !]<48!
- EI?@! "<89, E%><33!+8/3/69/8=!A<9C8D<2! [ 08N3, 013!:08! "DC5<9083=!J<L069!#0, /892! "<89, ! ) 03/87<9082!
- EI?@! A54%, <9!+8/3/69/8=!&L/845<6!; C3/CL!O:!\*<9C8<>!K439O82=!\*/M!HO8N!%492=!\*/M!HO8N!
- EI?1! +<6/>439=!(L1<593!0:!%>4L<9/!%,<6B/=!]<48>/4B, !#45N46306!\$647/83492!]8/3, L/6!K06083!93.7694cmBT5000

Ike?E!	ACO_/59!0:!A54/694:45!&L/845<6!<8945>/!<6D!M/0V0<3/D!3>4D/!3,0M!bA54/694393!]08B/! 9,80CB,!A/7/8/!A/ (5/!90!F/99/8!#/9/8L46/! [,2!&69<85945<P3!. <54/83!<8/! %0>><1346B=c!,991UeeMMM-354/694:45 <l 845<6-50le<8945="">/-5:Lt4Dp&lt;69&lt;85945<v< th=""></v<></l>
	354/694393VD/9/8L46/VM, 2VB><54/83V<8/V50>><1346B!!
?EeEfeI@!	ACO_/59!0:! <i>HL</i> %?/",%D*)#*,!<8945>/U!%080/99=!*-=!b;0695><48!\$647/83492!180:/33083!!
!!!	,/ <d46b!c1!&69<85945<!98413!90!39cd2!b>00&lt;&gt;!M&lt;8L46B!/::/593c!</d46b!c1!&69<85945<!98413!90!39cd2!b>
IkeI@! !	]/<9C8/D!46!;0695><48!A9<9/!\$647/83492P3!EII@!+8/34D/69P3!G/1089!
I^e^?eI1!	(69/874/M!M49,!*T*!8/B<8D46B!9,/! [ 4>N463!(5/!A,/>:!50>><13/=!&69<85945 </td
I^eEkeI1!	(69/874/M!M49,!',/![/<9,/8!%,<66/>!8/B<8D46B!9,/![4>N463!(5/!A,/>:!50>><13/=!
!!	&69<85945 </td
IEeIkeIk!	ACO_/59!0:!@-\$/&(''7,\J7!*8!<8945>/U!+089/8=!;<8N-!A-=!b.>00<>!M<8646BU!;A\$!!
!!	354/69439!M496/33/3!B><54<>!D43469/B8<9406c!
I^e?WeIk!	(69/874/M!M49,!*T*!06!%>4L<9/!%,<6B/!46!&69<85945 </td
?e?WeIW!	(69/874/M!M49,!o/69!A9<9/!*/M3!06!&85945!)5/<6!/Y1/D49406=!3//!
	<u>,991UeeL/D4&lt;-MMM-N/696/M36/9-50LeL/D4<e3908<b 81wke6="" <="" e1<1="" m3eeiikei?e?we*="" u=""></e3908<b></u>
	M3e+80:/33083!!
!!!	'0-; <n -&85945-'8="" n-a9cd2-%="">4L&lt;9/-%, &lt;6B/VEW^^?I?-3,9L&gt;!</n>
TC6/!EIIZ!	]/<9C8/D!46!*/M!T/83/2!FC346/33!L <b<`46 54<="" \3!31="">!3/59406!06U!',/!(6607&lt;947/!!</b<`46>
	A9<9/=!'/5,60>0B2!'84CL1,3-!f%0>>/B/3!<8/!9,/!%<9<>2393!:08!8/3/<85,!<6D!,4B,V!
	9/5, <i>f</i> !M49, !; A\$!50>>/ <bc 01146b!<6d!#8-!hc<6!.<0-!<="" 3!#8-!;="" <8n!%,="" td=""></bc>
I feEkeIZ!	ACO_/59!0:!@-\$/&("7,%J7!*8!<8945>/U!+089/8=!;<8N-!A-=!bK09!D43507/82!46! 50 D!!
!!	05/<60!!; A\$!180:/3308=!39CD/69!1<89!0:!9/ <l!7 84:246b!70="">5&lt;60!46!&amp;69&lt;85945!!</l!7>
!!	A0C6Dc!
I feEIeIZ!	(69/874/M!M49,!*T*!06!9,/!D43507/82!0:!<6!C6D/83/ 70 5<60!46!&69<85945 </td
; <2!EIIZ!	%07/8 <b !0:!&69<85945!c6d="" 83="" <!70="">5&lt;60!D43507/82!5&lt;884/D!02!9,/!:0&gt;&gt;0M46B!!</b>
	6/M3! <b 33="!J-&amp;-!'4L/3=!*/M3D&lt;2=!A&lt;6!]8&lt;654350!&lt;/td" 3u!!&33054<9="" 654="" d!+8=""></b>
	%, 80645>/=!&9><69 T0C86< V%063949C9406=! # /98049!]8//!+8/33=! \$ A&! ' 0D<2=! ' 080690!
	A9<8=!(6D4<6<10>43!A9<8=!o<63<3!%492!A9<8=!+406//8!+8/33!Q; *R=!+8070!#<4>2!K/8 <d! Q\$ 'R=!*/M3M43/!Q6/M3!M48/R=!%0698<!--%039<!Q%&R! '4L/3=!; 069/8/2!%0C692!K/8<D!</td--></d! 
	$\psi = \pi^{-1}$ (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)

%) \* '(\* \$(\* . !" # \$%& '() \* !& \* # !+G)] "AA() \* & J !# "d "J) + ; " \* '!

- EIEZ! A054/92!0:!G/3/<85, !&DL464398<9083!(69/86<9406<>U!\*(K!GVA/84/3!Q?-f!%"!58/D493R!
- EIEZ! A054/92!0:!G/3/<85, !&DL464398<9083!(69/86<9406<>U!+846541>/3!46!G/3/<85, !#/7/>01L/69! QZ-I!% "!58/D493R!
- EIEZ! A054/92!0:!G/3/<85, !&DL464398<9083!(69/86<9406<>U!&(!46!G/3/<85, !&DL464398<9406U!]C9C8/! '8/6D3=!\$3/!%<3/3=!<6D!%0>><008<947/!)11089C6494/3!Q?-I!%"!58/D49R!
- EIEZ! A054/92!0:!G/3/<85, !&DL464398<9083!(69/86<9406<>U!&(!46!G/3/<85, !&DL464398<9406U!&!\*/M! %, <>>/6B/!0?-I!% "!58/D49R!
- EIEZ! A054/92!0:!G/3/<85, !&DL464398<9083!(69/86<9406<>U!&D7<6546B!G/3/<85, !&DL464398<9406! M49, !&(V+OM/8/D!A0>C94063!<9! "L082!\$647/83492!Q?-I!% "!58/D49R!
- EIEZ! b',/!\*/M!<6D!]C9C8/!A/6408!G/3/<85,!)::45/8!QAG)R! [08N3,01=:&33054<9406!0:!+C0>45! <6D!J<6D!.8<69!\$647/83494/3!%0C654>!06!G/3/<85,-!
- EIE^! b', /!\*/M!<6D!]C9C8/!A/6408!G/3/<85,!)::45/8!QAG)R! [08N3,01=!&33054<9406!0:!+C0>45! <6D!J<6D!.8<69!\$647/83494/3!%0C654>!06!G/3/<85,!
- EI?E! brC<6949<947/!jV8<2!; 4580<6<>2343U!+800>/L!A0>746B!C346B!"#A!<6D! [#A!'/5,64\C/3=c!!
- ! ! J / ,4B ,! ; 458035012!A5 ,00>=!TC6/!ZV1=!E1?E!
- EI?I! KOON/!%0>>/B/!0:!&11>4/D!A54/65/3!0:08L/8>2!; 5%806/!.80C1!%0>>/B/!0:!; 458035012R=!!

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