

!" #&/

4;O <548G=>3> 70AB>AC20==O ;V:0@AL:>3> 70A>1C

\$!-/

!,:04:

4VNG0 @5G>28=0: celecoxib;

1 :0?AC;0 :A81C 100 <3 01> 200 <3;

4>?>28=8: ;0:B>70, <>=>3V4@0B; =0B@VN :@>A:0@<5;>70; =0B@VN ;0C@8;AC;LD0B; ?>2V4>=; <03=VN AB50@0B;>1>;>=: 0?AC;8 78= (E 127), B8B0=C 4V>:A84 (171), EV=>;V=>289 6>2B89 (E 104), 65;0B8=, G>@=8;0 G>@=V (C @07V =0=5A5==O B>@3>2>3> 7=0:C ?V4?@8TGlaze 45 % @>7G8= 2 5B0=>;V, 70;V70 >:A84 G>@=89 (172), ?@>?V;5=3;V>;L, 0G8= :=F5=B@>20=89) (4>7C20==O 100 <3) 01> ?0B5=B>20=89 A8=V9 V (E 131), B8B0=C 4V>:A84 (171), 65;0B8= (4>7C20==O 200 <3).

V:0@AL:0 D>@<0. □0?AC;8.

A=>2=V DV78:>-EVABV: B25@4V 65;0B8=>2V :0?AC;8 7 =5?@>7>@8<8 :>@?CA>< V :@8H5G:>N 6>2B>3> (4>7C20==O 100 <3) 01> 2V4 A2VB;>-1;0:8B=>3> 4> 1;0:8B=>3> (4>7C20==O 200 <3) :>;L>@C. @>H>: 1V;>3> :>;L>@C. >?CA:0TBLAO =0O2=VABL 03;<5@0BV2 G0AB>: ?>@>H:C. 0 :0?AC;C (4>7C20==O 100 <3) 4>?CA:0TBLAO =0=>A8B8 B>20@=89 7=0: ?V4?@8T ".

\$0@<0:>B5@0?52B8G=0 3@C?0. @>B870?0;L=V B0 0=B8@52<0B8G=V 70A>18. □>:A818.

>4 "% 0101.

\$0@<0:>;>3VG=V 2;0AB82>ABV.

\$0@<0:>48=0 5AB5@>W4=89 ?@>B870?0;L=89 70AV1 (), I> 45<>=AB@CT ?@>B870?0;L=C, 0=0;35B8G=C B0 60@>7=86C20;L=C 0:B82=VABL. 2060TBLAO, I><5E0=V7< 4VW F5;5:>:A81C 7C <>2;5=89 ?@83=VG5==O< A8=B57C ?@>AB03;0=48=V2 ?5@5206=> H;OE< V=3V1C20==O F8;>;>:A835=078-2 (? C B5@0?52B8G=8E :=F5=B@0FVOE C ;N48=8 F5;5:>:A81 =5 V=3V1CT V7>D5@ <5=B F8;>;>:A835=07C-1 (&-1).

"@><1>F8B8. =0A;V4>: 2V4ACB=>ABV 2?;82C =0 B@><1>F8B8 F5;5:>:A81 =5 <>65 70DV;0:B8FV A5@F52>-AC48==8E 70E2>@N20=L. 52V4><>, G8 2?;820T F5;5:>:A81 =0 B@><1>F8B8 C ?;0=V ?V428I5==O @878:C @>728B:C A5@9>7=8E A5@F52>-AC48==8E B@><1>B8G=8E ?>1VG=8E @50: FV9, ?>2O70=8E V7 70AB>AC20==O< F5;5:>:A81C.

0B@8. @83=VG5==O A8=B57C PGE2 <>65 ?@872>48B8 4> 70B@848 70 @0EC=>: 71V;LH5==O @501A>@1FVW C 28AEV4=V9 B>2ABV9 G0AB8=V ?5B;V 5=;5 <>7:>2>3> H0@C =8@>: V, <>6;82>, 2 V=H8E A53<5=B0E 48AB0;L=8E 2V44V;V2 =5D@>=C. 2060TBLAO, I> PGE2 ?@83=VGCT @501A>@1FVN 2>48 C 71V@=8E B@C1>G:0E, ?5@5H:>460NG8 4VW 0=B84VC@5B8G=>3> 3>@<>=C. \$0@<0:>:V=5B8:0.

1A>@1FVO. V:>2V :=F5=B@0FVW F5;5:>:A81C C ?;072V 4>AO30NBLO ?@81;87=> G5@57 3 3>48=8 ?VA;O ?5@>@0;L=>3> ?@89>2V :=F5=B@0FVW ?@5?0@0BC C ?;072V (C_{max}) B0 ?;>I0 ?V4 :@82>N (AUC) T ?@81;87=> ?@>?>@FV9=8<8 4>7V 4> 200 <3 42VGV =0 4>1C; ?@8 28I8E 4>70E A?>AB5@V30TBLO <5=H ?@>?>@FV9=5 71V;LH5==O C_{max} V AUC. >A;V465==O 01A>;NB=>W 1V>4>ABC?=>ABV =5 ?@>2>48;8AO. @8 1030B>@07>2>206=89 AB0= 4>AO30TBLO =0 5-9 45=L 01> @0=VH5.

?;82 W6V. >;8 F5;5:>:A81 ?@89<0;8 @07>< 7 W65N 7 28A>:8< 2< 68@V2, ?V:>2V :=F5=B@0FVW C ?;07 2V 4>AO30;8AO ?@81;87=> =0 1-2 3>48=8 ?V7=VH5, 0 7030;L=0 01A>@1FVO (AUC) 71V;LHC20;0AO =0 10-20 %. @8 ?@89>70E 28I5 200 <3 71V;LH5==O C_{max} V AUC 2V41C20TBLO <5=H ?@>?>@FV9=>, I> 22060TBLO =0A;V4:>< =87L:>W @>7G8==>ABV ;V:0@AL:>3> 70A>1C C 2>4=>28IV.

!C?CB=T 70AB>AC20==O F5;5:>:A81C 7 0=B0F840<8, O:V 2V 7V 7<5=H5==O< C_{max} =0 37 % V AUC =0 10 %. ?5:>:A81 C 4>70E 4> 200 <3 42VGV =0 4>1C <>6=0 ?@89<0B8 =570;56=> 2V4 ?@89>78 ?@5?0@0BC (400 <3 42VGV =0 4>1C) A;V4 ?@89<0B8 7 W65N 4;O ?>:@0I5==O 01A>@1FVW. 030;L=0 A8AB5<=0 5:A?>78FVO (AUC) F5;5:>:A81C 1C;0 >4=0:>2>N ?@8 9>3> ?@89>W :0?AC;8 V ?@8 4>4020==V 2 VA;O ?@89> V7 01;CG=8< ?N@5 7=0G=8E 7:07=8:0E C_{max}, T_{max} 01> "½=5 A?>AB5@V30;>AO.

>7?>4V.; ?5:>:A81 C <560E 4V0?07>=C ;;V=VG=8E 4>7 <0T 28A>:89 ABC?V=L 7207C20==O 7 1V;:0<8 (~97 %). >A;V465==O in vitro?>:07CNBL, I> F5;5:>:A81 7207CTBLAO ?5@5206=> 7 0;L1C< V,<5=H>N N, 7 α_1 :8A;8< 3;V:>?@>B5W=>1 □ T < @>7?>4V;C C @V2=>206=>(V_{ss}/F) AB0=>28BL ?@81;87=> 400 ;, I> A2V4G8BL ?@> 5:AB5=A82=89 @>7?>4V; ?@5?0@0BC C B:0=8=0E. ?5:>:A81 ?5@5206=> =5 7207CTBLAO 7 5@8B@>F8B0<8.

5B01>;V7 5B01>;V7< F5;5:>:A81C ?5@5206=> 74V9A=NTBLAO V7>D5@<5=B>< CYP2C9. # ?;072V ;N48=8 1C;> V45=B8DV:>20=> B@8<5B01>;VB8: ?5@28==89 A?8@B, 2V4?>2V4=0 :0@1=>=>20 :8A;>B0 B0 WW 3;N:C@>=V4=89 :=N30B. &V <5B01>;VB8 =5 <0NBL 0:B82=>ABV I>4> V=3V1C20==O &□-1 01> &□-2.

:A:@5FVO. ?5:>:A81 282>48BLAO ?5@5206=> H;OE<< <5B01>;V7(<3 %) :V;L:VABL =573> ;V:0@AL:>3> 70A>1C. VA;O ?5@>@0;L=>3> 70AB>AC20==O >4=>:@0B=>W 4>78 ?@5?0@0BC,3> @04V>V7>B>?> <, 1;87L:> 57 % 4>78 282>48;>AO 7 :0;< V 27 % V7 A5G5N. A=>2=8< <5B01>;VB< C A5GV B0 :0;V 1C;0 :0@1=>=>20 :8A;>B0 (73 % 4>78), ?@8 FL>6 28O2;O;0AO =525;8:0 :V;L:VABL 3;N:C@>=V4C. 2060TBLAO, I> =87L:0 @>7G8==VABL ?@5?0@0BC ?>4>26CT ?@>F5A 01A>@1FVW, I> @>18BL $\frac{1}{2}$ 1V;LH 20@V015;L=8<. D5:B82=89 $\frac{1}{2}$ AB0=>28BL ?@81;87=> 11 3>48= 70 C<>2 ?@89> #02=89 ;;V@5=A (CL/F) ?;07<8 :@>2V AB0=>28BL 1;87L:> 500<;/E2.

0FVT=B8 ;VB=L>3> 2V:C. # ?0FVT=BV2 ;VB=L>3> 2V:C (2V:< 2V4 65 @>:V2) C @V2=>206=>C_{max} 1C;0 =0 40 % 28I0 V AUC =0 50 % 28I0 ?>@V2=O=> 7 B0:8<8 C ?0FVT=BV2 <>;>4H>3> 2V:C. # 6V=>: ;VB=L>3> 2V:C C_{max} V AUC 4;O F5;5:>:A81C T 28I8<8, =V6 C G>;>2V:V2 ;VB=L>3> 2V:C, 0;5 F5 ?V428I5==O ?5@5206=> T =0A;V4:<< <5=H>W <0A8 BV;0 C B0:8E 6V=>:. 030;<< :>@83C20B8 4>7C 4;O ?0FVT=BV2 ;VB=L>3> 2V:C =5 ?>B@V1=>. 4=0: C ?0FVT=BV2 7 <0A>N BV;0 <5=H5 50 :3 ;V:C20==O A;V4 ?>G8=0B8 7 =09<5=H>W @5:><5=4>20=>W 4>78.

0A>20 ?@8=0;56=VABL. 57C;LB0B8 <5B0-0=0;V7C 4>A;V465=L D0@<0>:V=5B8:8 A2V4G0BL ?@> B5, I> AUC F5;5:>:A81C T ?@81;87=> =0 40 % 1V;LH>N C ?@54AB02=8:V2 =53@>W4=>W @0A8 ?>@V2=O=> 7 ?0FVT=B0<8 T2@>?5>W4=>W @0A8. @8G8=0 V ;;V=VG=0 7=0GCIVABL FL>3> A?>AB5@565==O =52V4>

5GV=:>20 =54>AB0B=VABL. >A;V465==O D0@<0>:V=5B8:8, ?@>2545=5 70 CG0ABN ?0FVT=BV2 7 ?5GV=:>2>N =54>AB0B=VABN ;53:>3> (:;0A 70 H:0;>N '09;40-N) V A5@54=L>3> (:;0A 70 H:0;>N '09;40-N) ABC?5=O BO6:>ABV, ?@>45<>=AB@C20;>, I> AUC F5;5:>:A81C C @V2=>206=>N ?@81;87=> =0 40 % V 180 % 2V4?>2V4=> ?>@V2=O=> 7V 74>@>28<8 4>1@>2>;LFO<8 :=B@>;L=>W 3@C?8. "> @5?0@0B =5 @5:<<5=4CTBLAO 70AB>A>2C20B8 ?0FVT=B0< 7 BO6:>N ?5GV=:>2>N =54>AB0B=VABN

8@:>20 =54>AB0B=VABL. 3V4=> 7 @57C;LB0B0<8 ?>@V2=O==O A;V465==O<8, AUC F5;5:>:A81C 1C;0 ?@81;87=> =0 40 % =86G>N C ?0FVT=BV2 7 E@>=VG=>N =8@:>2>N =54>AB0B=VABN (H284:VABL ;;C1>G:>2>W DV;LB@0FVW 35-60<;/E2), =V6 C ?0FVT=BV2 7 =>@<0;L=>N DC=:FVTN =8@>:. =0GCI>3> 270T<>7207:C G:>2>W DV;LB@0FVW V ;;V@5=A< F5;5:>:A81C 28O2;5=> =5 1C;>. >A;V465=L 70 CG0ABN ?0FVT=BV2 7 BO6:>N =8@:>2>N =54>AB0B=VABN =5 ?@>2>48;>AO. /: V C 28?04:C 7 V=H8<8 , ?@5?0@0B =5 @5:<<5=4CTBLAO 70AB>A>2C20B8 ?0FVT=B0< 7 BO6:>N =8@:>2>N =54>AB0B=VABN.

70T<>4VO 7 V=H8<8 ;V:0@AL:8<8 70A>10<8. >A;V465==O in vitro?>:07CNBL, I> F5;5:>:A81 =5 T V=3V1VB>@<< V7>D5@<5=BV2 2C9, 2C19 01> 3A4 F8B>E@> P450.

4>A;V465==OE in vivo>B@8<0=> @57C;LB0B8, =02545=V =86G5.

VBV9. # 4>A;V465==V, ?@>2545=>@>28E 4>1@>2>;Lfv2, A5@54=V9 @V25=L ;VBVN C ?;072V C @V2=>206=> =0 17 % C ?0FVT=BV2, O:V >B@87V 450 <3 42VGV =0 4>1C @07<< 7 F5;5:>:A81< C 4>7V 200 <3 42VGV =0 4>1C, ?>@V2=O=> 7 4>1@>2>;LFO<8, O:V ?@89<0;8 ;8H5 ;VBV9.

\$.C:>=07>.; !C?CB=T 70AB>AC20==O D;C:>=07>;C C 4>7V 200 <3 1 @07 =0 4>1C ?@872>48;> 4> ?V428I5==O :=F5=B@0FVW F5;5:>:A81C C ?;072V C 2 @078. "0:5 ?V428I5==O T =0A;V4:<< V=3V1C20==O D;C:>=07>;<< <5B01>;V7:A81C, O:5 74V9A=NTBLAO V7>D5@<5=B>< CYP2C9.

=HV;V:0@AL:V 70A>18. ?;82 F5;5:>:A81C =0 D0@<0>:V=5B8:C V/01> D0@<0>:48=0:=07>;C, <5B>B@5:A0BC, D5=VB>W=C V B>;1CB0A;V465==OE in vivo, O:V =5 28O28;8 ;;V=VG=> 206;828E 270T <>4V9 7 F8<8 ;V:0@AL:8<8 70A>10<8.

:B82=VABL V7>D5@<5=BC CYP2C9 T 7=865=>N C >AV1 7 35=5B8G=8<8 ?>;V<>@DV7<0<8, O:V ?@872>4OBL 4> 7=865==O D5@<5=B=>W 0:B82=>ABV (=0?@8;:04, ?0FVT=B8, 3<>>783>B=V 70 35=0 <8 CYP2C9*2 V CYP2C9*3). B@8<0=V 7 4<548G=8E ?C1;V:0FV9 >1<565=V 40=V 4>A;V465=L, O:V 2;:NG0;8 CAL>3> 8 ?0FVT=BV2 7 3<>>783>B=8< 35=>B8?<< CYP2C9*3/*3, A2V4G0BL, I> A8AB5

<=V :>=F5=B@0FVW F5;5:>:A81C C F8E ?0FVT=BV2 1C;8 C 3-7 @07V2 28IV ?>@V2=O=> 7 ?0FVT=B0
<8, O:V <0;8 35=>B8?8 CYP2C9*1/*1 01> *I/*3. \$0@<0:>:V=5B8:0 F5;5:>:A81C =5 >FV=N20;0AO C >AV1
7 V=H8<8 2840<8 ?>;V<>@DV7CYP2C9, B0:8<8 O: *2, *5, *6, *9 V *11. AB0=>2;5=>, I> G0AB>B0 3>
<>783>B=>3> 35=>B8?C *3/*3 C @V7=8E 5B=VG=8E 3@C?0E AB0=>28BL 2V4 0,3% 4> 1 %.

;V=VG=V E0@0:B5@8AB8:8.

>:070==O. @5?0@0B ?>:070=89:

- 4;O ?>A;01;5==O >7=0: V A8AB5>0@B@8BC, @52<0B>W4=>3> 0@B@8BC B0 0=;V;>7CNG>3>
A?>=48;VBC;

- 4;O ;V:C20==O 3>AB@>3> 1>;N C 4>@>A;8E ?0FVT=BV2;

- 4;O ;V:C20==O ?5@28==>W 48A<5=>@5W.

@>B8?>:070==O. @5?0@0B ?@>B8?>:070=89:

- ?0FVT=B0< 7 ?V428I5=>N GCB;82VABN 4> F5;5:>:A81C, 0A?V@8=C 01> V=H8E ;

- ?0FVT=B0<, C O:8E A?>AB5@V30;8AO @50:FVW 0;5@3VG=>3> B8?C =0 AC;LD0=V;0

- ?0FVT=B0< 7 =0O2=VABN 2 0=0<=57V 1@>=EV0;L=>W 0AB<8, :@>?82O=:8 01> V=H8E @50:FV9
0;5@3VG=>3> B8?C ?VA;O 70AB>AC20==O 0A?V@8=C G8 V=H8E . # B0:8E ?0FVT=BV2

A?>AB5@V30;8AO BO6:V 0=0DV;0:B>W4=V @50:FVW =0 , 45O:V 7 O:8E ?@8725;8 4> ;5B0;L=>3>
=0A;V4:C;

- 4;O ;V:C20==O ?5@8>?5@0FV9=>3> 1>;N ?@8 ?@>2545==V >?5@0FVW 0>@B>:>@>=0@=>3>
HC=BC20==O;

- ?0FVT=B0< 7 3>AB@>N H;C=:>2>-.8H:>2>N :@>2>B5G5N.

70T<>4VO 7 V=H8<8 ;V:0@AL:8<8 70A>10<8 B0 V=HV 2848 270T<>4V9.

030;L=0 V=D>@<0FVO. 5B01>;V7< F5;5:>:A81C ?5@5206=> 74V9A=NTBLAO V7>D5@<5=B<< CYP2C
9 C ?5GV=FV. !C?CB=T 70AB>AC20==O F5;5:>:A81C 7 ;V:0@AL:8<8 70A>10<8, O:V V=3V1CNBL

V7>D5@<5=B CYP2C9, A;V4 74V9A=N20B8 7 >15@56=VABN. ?5:>:A81 <65 7=0G=8< G8=>< 270T
<>4VOB8 V7 ;V:0@AL:8<8 70A>10<8, O:V V=3V1CNBL V7>D5@<5=B CYP2C9.

>A;V465==O in vitro 45<>=AB@CNBL, I> F5;5:>:A81 T V=3V1VB>@< V7>D5@<5=BC CYP2D6, E>G V
=5 T 9>3> AC1AB@0B> ">in vivo 7 ;V:0@AL:8<8 70A>10<8, O:V <5B01>;V7CNBLAO V7>D5@<5=B<<
CYP2D6.

0@D0@8=. 0FVT=B0<, O:V 70AB>A>2CNBL 20@D0@8= 01> ?>4V1=V ;V:0@AL:V 70A>18, ?VA;O
?>G0B:C 70AB>AC20==O ?@5?0@0BC 01> 2=5A5==O 7AC20==O ?@5?0@0BC, >A>1;82> C ?5@HV
:V;L:0 4=V2, A;V4 AB568B8 70 0=B8:>03C;O=B=>N 0:B82=VABN, >A:V;L:8 B0:V ?0FVT=B8<0NBL

?V428I5=89 @878: @>728B:C CA::04=5=L C 283;O4V :@>2>B5GV. A=CNBL 40=V, I> 2?;82 F5;5:>:A81C
=0 0=B8:>03C;O=B=C 4VN 20@D0@8=C 4>A;V46C202AO C 3@C?V 74>@>28E 4>1@>2>;LFBV2, O:V
I>45==> >B@8 # 4>1@>2>;LFBV2 F5;5:>:A81 =5 2?;8202 =0 0=B8:>03C;O=B=C 4VN 20@D0@8=C, I>

287=0G0;>AO 70 ?@>B@<1V=>28< G0A> 4=0: ?V4 G0A 70AB>AC20==O ?@5?0@0BC ?VA;O 28E>4C
9>3> =0 @8=>: C ?0FVT=BV2, O:V >4=>G0A=> >B@8:A81 V 20@D0@8=, A?>AB5@V30;8AO

A5@9>7=V ?>1VG=V @50:FVW C 283;O4V :@>2>B5G, 45O:V 7 O:8E ?@8725;8 4> ;5B0;L=>3>
=0A;V4:C (?5@5206=> C ?0FVT=BV2 ;VB=L>3> 2V:C) =0 D=>V 71V;LH5==O ?@>B@<1V=>2>3>

G0AC.

VBV9. !;V4 @5B5;L=> A?>AB5@V30B8 70 ?0FVT=B0<8, O:V >B@8G0B:C 70AB>AC20==O ?@5?0@0BC
01> ?V4 G0A 9>3> 2V4

A?V@8=. @5?0@0B <>6=0 70AB>A>2C20B8 @07<< V7 =87L:8<8 4>70<8 0A?V@8=C. 4=0: AC?CB=T
70AB>AC20==O 0A?V@8=C 7 ?@5?0@0B<< ?V428ICT G0AB>BC CB2>@5==O 28@07:8 H;C=:>2>-
:8H:>2>3> B@0:BC 01> V=H8E CA::04=5=L ?>@V2=O=> V7 70AB>AC20==O< ;8H5 F5;5:>:A81C.

=0A;V4>: 2V4ACB=>ABV 2?;82C =0 B@<<1>F8B8 ?@5?0@0B =5 <>65 70DV;0:B8FV A5@F52>-
AC48==8E 70E2>@N20=L.

=3V1VB>@8 \$ V 0=B03>=VAB8 0=3V>B5=78=C II. <>6CBL ?>A;01;N20B8 0=B83V?5@B5=782=89 5D5:B
V=3V1VB>@V2 0=3V>B5=78=?5@5B2>@N20;L=>3> D5@<5=BC (\$) V 0=B03>=VABV2 0=3V>B5=78=C

II. &N 270T<>4VN A;V4 2@0E>2C20B8, O:I> ?0FVT=B8 ?@89<0NBL ?@5?0@0B @07<< 7 V=3V1VB>@0
<8 \$ V 0=B03>=VAB0<8 0=3V>B5=78=C .

?0FVT=BV2 ;VB=L>3> 2V:C, ?0FVT=BV2 7V 7=865=8< >1T<<< F8@:C;NNG>W :@>2V (C B. G. ?@8
70AB>AC20==V 4VC@5B8:V2) 01> ?>@CH5==O< DC=:FVW =8@>: 70AB>AC20==O V=3V1VB>@V2 \$

@07>< V7 , 2:;NG0NG8 A5;5:B82=V V=3V1VB>@8 &□-2, <>65 ?@872>48B8 4> ?>3V@H5==O DC=:FVW =8@>:, 2:;NG0NG8 <>6;8289 @>728B>: 3>AB@>W =8@>:2>W =54>AB0B=>ABV. 0728G09 ?VA;O ?@8?8=5==O 70AB>AC20==O AB0= ?0FVT=B0 ?>25@B0TBLAO 4> @V2=O, I> A?>AB5@V302AO 4> ?>G0B:C ;V:C20==O.

\$.C:>=07>;. !C?CB=T 70AB>AC20==O D;C:>=07>;C C 4>7V 200 <3 1 @07 =0 4>1C ?@872>48;> 4> ?V428I5==O :>=F5=B@0FVW F5;5:>:A81C C ?;072V C 2 @078. "0:5 ?V428I5==O T =0A;V4:< V=3V1C20==O D;C:>=07>;< <5B01>;V7 F5;5:>:A81C, O:89 74V9A=NTBLAO V7>D5@<5=B< CYP2C 9. # ?0FVT=BV2, O:V >B@8=07>;, 70AB>AC20==O ?@5?0@0BC A;V4 ?>G8=0B8 7 =09<5=H>W @5:> <5=4>20=>W 4>78.

\$.C@>A5# 450:8E ?0FVT=BV2 <>6CBL ?>A;01;N20B8 =0B@V9C@5B8G=89 5D5:B DC@>A5 "0:0 @50:FVO ?>OA=NTBLAO V=3V1C20==O< A8=B57C ?@>AB03;0=48=V2 C =8@:0E.

5B>B@5:A0B. # 4>A;V465==V 270T<>4VW ;V:0@AL:8E 70A>1V2, I> ?@>2>48;>AO 70 CG0ABN ?0FVT=BV2 7 @52<0B>W4=8< 0@B@8B><, O:V ?@89<0;8 <5B>B@5:A0B, F5;5:>:A81 =5 2?;8202 =0 D0@<0:>:V=5B8:C <5B>B@5:A0BC.

!C?CB=T 70AB>AC20==O. @5?0@0B =5 A;V4 70AB>A>2C20B8 >4=>G0A=> 7 1C4L-O:8<8 4>70<8 =50A?V@8=>28E G5@57 ?>B5=V9=5 ?V428I5==O @878:C @>728B:C ?>1VG=8E @50:FV9.

A>I;82>ABV 70AB>AC20==O.

!5@F52>-AC48==V B@><I>B8G=V ?>4VW. "@820;5 70AB>AC20==O ?@5?0@0BC <>65 ?V428I8B8 @878: @>728B:C A5@9>7=8E ?>1VG=8E A5@F52>-AC48==8E B@<1>B8G=8E ?>4V9, V=D0@:BC :0@40 B0 V=AC;LBC, O:V <>6CBL ?@8725AB8 4> ;5B0;L=>3> =0A;V4:C.

0AB>AC20==O 2AVE , O: A5;5:B82=8E, B0: V =5A5;5:B82=8E AB>A>2=>&□-2, <>65 <0B8 0=0;>3VG=89 @878:. # ?0FVT=BV2 V7 A5@F52>-AC48==8<8 70E2>@N20==O<8 01> D0:B>@0<8 @878:C WE

@>728B:C, @878: <>65 1CB8 28I8>1 725AB8 4> B5=V9=89 @878: ?>1VG=8E A5@F52>-AC48==8E ?>4V9 C ?0FVT=BV2, O:V 70AB>A>2CNBL ?@5?0@0B, :>6=>:@5<>A>2C20B8 =09<5=HC 5D5:B82=C 4>7C ?@>B03>< =09:>@>BH>3> ?5@V>4C G0AC 2V4?>2V4=> 4> FV;59 ;V:C20==O. □V:0@O< B0 ?0FVT=B0< A;V4 1CB8 4C65 C206=8<8 I>4> @>728B:C B0:8E ?>4V9, =02VBL 70 2V4ACB=>ABV A8:C A5@F52>-AC48==>W A8AB5<8 C <8=C;> ;!;V4 ?@>V=D>@ >7=0:8 B0/01> A8<8 A5@9>7=>W A5@F52>-AC48==>W B>:A8G=>ABV B0 70E>48, O:8E =5>1EV4=> 268B8 ?@8 WE ?>02V.

5@5:>=;82V 4>:078 B>3>, I> AC?CB=T 70AB>AC20==O 0A?V@8=C 7<5=HCT ?V428I5=89 @878: @>728B:C A5@9>7=8E A5@F52>-AC48==8E B@<1>B8G=8E ?>4V9, ?>2O70=8E V7 70AB>AC20==O< , 2V4ACB=V. !C?CB=T 70AB>AC20==O 0A?V@8=C V F5;5:>:A81C ?V428ICT @878: @>728B:C A5@9>7=8E ?>1VG=8E @50:FV9 7 1>:C H;C=:>2>-.8H:>2>3> B@0:BC.

42>E 25;8:8E :>=B@>;L>20=8E ;;V=VG=8E 4>A;V465==OE 70AB>AC20==O @V7=8E , A5;5:B82=8E AB>A>2=> &-2, 4;O ;V:C20==O 1>;N C ?5@HV 10-14 4=V2 ?VA;O >?5@0FVW 0>@B>:>@>=0@=>3> HC=BC20==O 1C;> 28O2;5=> ?V428I5==O G0AB>B8 28=8:=5==O V=D0@:BC :0@40 B0 V=AC;LBC.

@B5@V0;L=0 3V?5@B5=7VO. /: V C 28?04:C 7 CAV<0 , 70AB>AC20==O ?@5?0@0BC <>65 ?@8725AB8 4> 28=8:=5==O 01> ?>3V@H5==O ?5@51V3C 265 VA=CNG>W 0@B5@V0;L=>W 3V?5@B5=7VW, I> <>65 7C<>28B8 ?V428I5==O G0AB>B8 @>728B:C A5@F52>-AC48==8E ?>4V9. # ?0FVT=BV2, O:V ?@89 <0NBL BV07848 01> ?5B;52V 4VC@5B8:8, 5D5:B82=VABL B5@0?VW F8<8 ;V:0@AL:8<8 70A>10<8 <>65 7<5=HC20B8AO ?@8 70AB>AC20==V. !;V4 7 >15@56=VABN 70AB>A>2C20B8 , C B. G.

F5;5:>:A81, ?0FVT=B0< 7 0@B5@V0;L=>N 3V?5@B5=7VTN. 0 ?>G0B:C 70AB>AC20==O ?@5?0@0BC V ?@>B03>< CAL>3> :C@AC ;V:C20==O A;V4 74V9A=N20B8 @5B5;L=89 <=>VB>@8=3

0@B5@V0;L=>3> B8A:C. A=CNBL 40=V, I>C ;;V=VG=>A;V465==V CLASS G0AB>B0 @>728B:C 0@B5@V0;L=>W 3V?5@B5=7VW C ?0FVT=BV2, O:V 70AB>A>2C20;8 F5;5:>:A81, V1C?@>D5= V 48;>D5=0:, AB0=>28;0 2,4 % , 4,2 % V 2,5 % 2V4?>2V4=>.

0ABV9=0 A5@F520 =54>AB0B=VABL V =0I@O:8. # 450:8E ?0FVT=BV2, O:V ?@89<0;8 , C B. G. F5;5:>:A81, A?>AB5@V30;8AO 70B@87@0E>20=0 70 <5B>4>< 0?;0=0-59T@0, C ?0FVT=BV2, O:V ?@89 <0;8 F5;5:>:A81 C 4>7V 400 <3 42VGV =0 4>1C (I> C 4 V 2 @078 ?5@528ICT 4>78, @5:<5=4>20=V 4;O ;V:C20==O >AB5>0@B@8BC V @52<0B>W4=>3> 0@B@8BC 2V4?>2V4=>), V1C?@>D5= C 4>7V 800 <3 B@8GV =0 4>1C V 48;>D5=0: C 4>7V 75 <3 42VGV =0 4>1C AB0=>28;0 2V4?>2V4=> 4,5 % , 6,9 % V 4,7 % . 0FVT=B0< V7 70B@8N @V48=8 01> A5@F52>N =54>AB0B=VABN ?@5?0@0B A;V4 70AB>A>2C20B8 7 >15@56=VABN.

?;82 =0 H;C=:>2>-.8H:>289 B@0:B. 878: @>728B:C 28@07:8 H;C=:>2>-.8H:>2>3> B@0:BC, :@>2>B5GV 01> ?5@D>@0FVW. , 2:;NG0NG8 F5;5:>:A81, <>6CBL A?@8G8=OB8 @>728B>:

A5@9>7=8E H;C=:>2>-.8H:>28E O28I, C B. G. :@>2>B5GV, CB2>@5==O 28@07:8 V ?5@D>@0FVW
H;C=:0, B>=:>3> 01> B>2AB>3> :8H5G=8:0, I> <>65 ?@8725AB8 4> ;5B0;L=>3> =0A;V4:C. &V
A5@9>7=V ?>1VG=V @50:FVW <>6CBL 28=8:0B8 C ?0FVT=BV2, O:V ?@89<0NBL, C 1C4L-O:89 G0A
70=0O2=>ABV 01> 2V4ACB=>ABV ?>?5@546C20;L=8E A8!8<8 1C;8=0O2=V ;8H5 2>4=>3> 7 ?OB8
?0FVT=BV2, C O:8E @>728=C;0AO A5@9>7=0 ?>1VG=0 @50:FVO 7 1>:C 25@E=L>3> 2V44V;C
H;C=:>2>-.8H:>2>3> B@0:BC ?@8 70AB>AC20==V. '0AB>B0 CA:;04=5=>W 28@07:8 V 28@07:8 7
::V=VG=8<8 A8<0<8 G5@57 9 28;0 0,78 % A5@54 CAVE ?0FVT=BV2 4>A;V465==OCLASS V 2,19 % C
?V43@C?V ?0FVT=BV2, O:V ?@89<0;8 0F5B8;A0;VF8;>2C :8A;>BC C =87L:8E 4>70E. # ?0FVT=BV2
2V:<> ?>=04 65 @>:V2 FO G0AB>B0 G5@57 9 28;0 1,40 %, 0 ?@8 AC?CB=L>2>W :8A;>B8 3,06 %. @8
1V;LH B@820;>AC20==V VA=CT B5=45=FVO 4> ?V428I5==O 9>2V@=>ABV @>728B:C A5@9>7=8E
?>1VG=8E @50:FV9 7 1>:C H;C=:>2>-.8H:>2>3> B@0:BC C 1C4L-O:89 <><5=B ?V4 G0A :C@AC
;V:C20==O. 4=0: @878: VA=CT =02VBL ?@8 :>@>B:>G0A=>
!;V4 7 >A>1;82>N >15@56=VABN ?@87=0G0B8 ?0FVT=B0<, C O:8E @0=VH5 A?>AB5@V30;8AO
28@07:>20 E2>@>10 01> H;C=:>2>-.8H:>20 :@>2>B5G0. # ?0FVT=BV2, C O:8E @0=VH5
A?>AB5@V30;8AO ?5?B8G=0 28@07:0 V/01> H;C=:>2>-.8H:>20 :@>2>B5G0 V O:V ?@89<0NBL, @878:
@>728B:C H;C=:>2>-.8H:>2>W :@>2>B5GV T 28I8< 1V;LH =V6 C 10 @07V2 ?>@V2=O=> 7 ?0FVT=B0
<8, O:V =5 <0NBL 6>4=>3> 7 F8E D0:B>@V2 @878:C. > V=H8E D0:B>@V2, I> ?V428ICNBL @878:
@>728B:C H;C=:>2>-.8H:>2>W :@>2>B5GV C ?0FVT=BV2, O:V ?@89<0NBL, =0;560BL AC?CB=T
70AB>AC20==O ?5@>@0;L=8E :>@B8:>AB5@>W4V2 01> 0=B8:>03C;O=BV2, 1V;LH0 B@820;VABL
;V:C20==O, ?0;V==O, 26820==O 0;>3>;N, ;VB=V9 2V: V ?>30=89 7030;L=89 AB0= 74>@>2O.V;LH0
G0AB8=0 A?>=B0==8E ?>2V4<>;5=L ?@> ?>1VG=V @50:FVW 7 1>:C H;C=:>2>-.8H:>2>3> B@0:BC 7
;5B0;L=8<=0A;V4:<< AB>ACTBLAO ?0FVT=BV2 ;VB=L>3> 2V:C 01> >A;01;5=8E ?0FVT=BV2, V B>
2>48B8 7 >A>1;82>N >15@56=VABN.
)>1 725AB8 4> B5=FV9=89 @878: @>728B:C ?>1VG=8E H;C=:>2>-.8H:>28E O28I, :>6=>:@5<<
A>2C20B8 =09<5=HC 5D5:B82=C 4>7C ?@>B03<< =09:>@>BH>3> ?5@V>4C G0AC 2V4?>2V4=> 4>
FV;59 ;V:C20==O □V:0@O< B0 ?0FVT=B0< =5>1EV4=> 1CB8 4C65 C206=8<8 I>4> ?>O28 >7=0: V A82>-
:8H:>2>W 28@07:8 V :@>2>B5GV ?V4 G0A 70AB>AC20==O ?@5?0@0BC V C 28?04:C ?V4>7@8 =0
@>728B>: A5@9>7=8E ?>1VG=8E @50:FV9 7 1>:C H;C=:>2>-.8H:>2>3> B@0:BC A2>TG0A=>
?@>2>48B8 4>40B:>25 >1AB565==O V ;V:C20==O.;O ?0FVT=BV2, O:V =0;560BL 4> 3@C?8 28A>:>3>
@878:C, A;V4 @>73;O=CB8 <>6;82VABL 70AB>AC20==O 0;LB5@=0B82=8E 284V2 ;V:C20==O, I> =5
2.;NG0NBL ?@87=0G5==O. @5?0@0B ?@>B8?>:070=89 ?0FVT=B0< 7 3>AB@>N H;C=:>2>-.8H:>2>N
:@>2>B5G5N.
?;82 =0 ?5GV=:C. > 15 % ?0FVT=BV2, O:V ?@89<0NBL, <>6CBL <0B8 3@0=8G=5 ?V428I5==O @V2=O
>4=>3> 01> :V;L:>E ?5GV=:>28E D5@<5=BV2, 0 7=0G=5 ?V428I5==O @V2=O " 01> !" (?@81;87=> C
3 01> 1V;LH5 @07V2 2V4=>A=> 25@E=L>W 3@0=8FV =>@<8) A?>AB5@V30;>AO ?@81;87=> C 1 %
?0FVT=BV2, O:V 1@0;8 CG0ABL C ;V=VG=8E 4>A;V465==OE. "0:V 2V4E8;5==O ;01>@0B>@=8E
?>:07=8:V2 2V4 =>@<8 <>6CBL ?@>3@5AC20B8, 70;8H0B8AO =57 @8 70AB>AC20==V, C B. G.
F5;5>:A81C, A?>AB5@V30;8AO ?>>48=>:V 28?04:8 BO6:8E ?5GV=:>28E @50:FV9, 2.;NG0NG8
6>2BO=8FN V ;5B0;L=89 1;8A:028G=89 35?0B8B, =5:@>7 ?5GV=:8 V ?5GV=:>2C =54>AB0B=VABL
(45O:V 7 O:8E ?@872>48;8 4> ;5B0;L=>3> =0A;V4:C). A=CNBL 40=V, I> C :>=B@>;L>20=8E ;V=VG=8E
4>A;V465==OE G0AB>B0 28=8=:5==O 3@0=8G=>3> ?V428I5==O @V2=O ?5GV=:>28E D5@<5=BV2 (2
1,2-3 @078 28I5 25@E=L>W 3@0=8FV =>@<8) AB0=>28;0 6 % 4;O F5;5>:A81C V 5 % 4;O ?;0F51>, 0
7=0G=5 ?V428I5==O @V2=O " V !" A?>AB5@V30;>AO ?@81;87=> C 0,2 % ?0FVT=BV2, O:V
70AB>A>2C20;8 F5;5>:A81, V C 0,3 % ?0FVT=BV2, O:V >B@8.
V4 G0A 70AB>AC20==O ?@5?0@0BC 70 ?0FVT=B0<8 V7 A8<0<8 V/01> >7=0:0<8 <>6;82>3>
?>@CH5==O ?5GV=:>2>W DC=:FVW 01> 2V4E8;5==O<8 ?>:07=8:V2 ?5GV=:>28E ?@>1 2V4 =>@<8
A;V4 @5B5;L=> A?>AB5@V30B8 =0 ?@54<5B @>728B:C 1V;LH BO6:>W ?5GV=:>2>W @50:FVW.#
@07V ?>O28 ;V=VG=8E >7=0: V A8@N20==O ?5GV=:8 01> @>728B:C A8AB5<=8E ?@>O2V2
(=0?@8.;04 5>78=>DV;VW, 28A8?0==O B>I>) 70AB>AC20==O ?@5?0@0BC A;V4 ?@878=8B8.
?;82 =0 =8@:8. "@820;5 70AB>AC20==O ?@872>48;> 4> @>728B:C =5:@>7C =8@:>28E A>A>G:V2 B0
V=H8E 284V2 C@065==O =8@>:. 8@:>20 B>:A8G=VABL B0:>6 A?>AB5@V30;0AO C ?0FVT=BV2, C
O:8E ?@>AB03;0=48=8 =8@>: 2V4V3@0NBL :>@=C @>;L C ?V4B@8<0==V =8@:>2>W ?5@DC7VW.#
B0:8E ?0FVT=BV2 70AB>AC20==O <>65 A?@8G8=8B8 4>7>70;56=5 7<5=H5==O CB2>@5==O
?@>AB03;0=48=V2 V, O: =0A;V4>:, 7=865==O =8@:>2>3> :@>2>B>;C, I> <>65 ?@8A:>@8B8 @>728B>:
;V=VG=8E A82>W 45:> > ?0FVT=BV2, O:V <0NBL =0928I89 @878: @>728B:C FVTW @50:FVW,

=0;560BL ?0FVT=B8 7 ?>@CH5==O< DC=:FVW =8@>:, A5@F52>N =54>AB0B=VABN, ?>@CH5==O<
DC=:FVW ?5GV=:8, ?0FVT=B8, O:V ?@89<0NBL 4VC@5B8:8, V=3V1VB>@8 \$, 0=B03>=VAB8
@5F5?B>@V2 0=3V>B5=78=C II, B0 ?0FVT=B8 ;VB=L>3> 2V:C. 0728G09 ?VA;O ?@8?8=5==O
;V:C20==O AB0= ?0FVT=B0 ?>25@B0TBLAO 4> B0:>3>, O: 1C2 4> ?>G0B:C ;V:C20==O ?;82 =0 =8@:8
1C2 ?>4V1=89 4> 2?;82C, I> A?>AB5@V302AO ?@8 70AB>AC20==V V=H8E . 0 =5>1EV4=>ABV
?@87=0G5==O ?@5?0@0BC @5:><5=4CTBLAO ?@>2>48B8 @5B5;L=5 A?>AB5@565==O 70 DC=:FVTN
=8@>: ?0FVT=B0.

=0DV;0:B>W4=V @50:FVW.: V 4;O 2AVE C FV;>W4=V @50:FVW A?>AB5@V30;8AO C ?0FVT=BV2,
O:V @0=VH5 =5 70AB>A>2C20;8 F5;5>:A81. # ?0FVT=BV2, O:V 70AB>A>2C20;8 F5;5>:A81,
A?>AB5@V30;8AO ?>>48=>:V 28?04:8 0=0DV;0:B8G=8E @50:FV9 V 0=3V>=52@>B8G=>3> =01@O:C.
@5?0@0B =5 A;V4 70AB>A>2C20B8 ?0FVT=B0< 7 0A?V@8=>2>N B@V04>N. &59 A8<:>72820TBLAO
C ?0FVT=BV2 7 1@>=EV0;L=>N 0AB<N, C O:8E A?>AB5@V30TBLAO @8=VB 70 =0O2=>ABV G8
2V4ACB=>ABV =070;L=8E ?>;V?V2 01> C O:8E 28=8:0T BO6:89, ?>B5=V9=> ;5B0;L=89 1@>=E>A?07<
?VA;O ?@89>728B:C 0=0DV;0:B>W4=>W @50:FVW A;V4 725@=CB8AO ?> =52V4;:04=C<548G=C 4>?>
<>3C.

50:FVW 7 1>:C H:V@8. @5?0@0B T AC;LD0=V;0< V <>65 A?@8G8=OB8 @>728B>: A5@9>7=8E
?>1VG=8E @50:FV9 7 1>:C H:V@8, B0:8E O: 5:AD>;V0B82=89 45@<0B8B, A8=4@<< !BV25=A0-
6>=A>=0 V A8=4@<< 09T;;0, I> <>6CBL ?@8725AB8 4> ;5B0;L=>3> =0A;V4:C. &V A5@9>7=V ?>1VG=V
@50:FVW <>6CBL 28=8:0B8 =5A?>4V20=> V @>72820B8AO C ?0FVT=BV2, C O:8E @0=VH5 =5
A?>AB5@V30;>AO 0;5@3VW =0 AC;LD0=V;00FVT=B8 ?>28==V 1CB8 ?@>V=D>@<>20=V ?@> >7=0:8
V A8<8, I> A2V4G0BL ?@> A5@9>7=V 7:C H:V@8; ?@8 ?5@HV9 ?>O2V H:V@=8E 28A8?0=L 01> 1C4L-
O:>W V=H>W >7=0:8 ?V428I5=>W GCB;82>ABV ?@89< ?@5?0@0BC A;V4 ?@8?8=8B8.
V:C20==O :>@B8:>AB5@>W40<8. 5 A;V4 >GV:C20B8, I> ?@5?0@0B 740B5= 70@B8:>AB5@>W48 01>
<>65 70AB>A>2C20B8AO 4;O ;V:C20==O :>@B8:>AB5@>W4=>W =54>AB0B=>ABV. 0?B>25
?@8?8=5==O ;V:C20==O :>@B8:>AB5@>W40<8 <>65 ?@8725AB8 4> 703>AB@5==O
:>@B8:>AB5@>W4>70;56=>3> 70E2>@N20==O. # 28?04:C ?@89=OBBO @VH5==O ?@> ?@8?8=5==O
70AB>AC20==O :>@B8:>AB5@>W4V2 ?0FVT=B0<, O:V >B@8@B8:>AB5@>W48 B@820;89 G0A, WE
4>7C A;V4 7=86C20B8 ?>ABC?>2>.

5<0B>;>3VG=V 5D5:B8. # ?0FVT=BV2, O:V 70AB>A>2CNBL ?@5?0@0B, V=:;8 A?>AB5@V30TBLAO
0=5=B@>;L>20=8E ;V=VG=8E 4>A;V465==OE G0AB>B0 @>728B:C 0=528;0 0,6 % ?@8 ?@89>:A81C V
0,4 % ?@8 ?@89>. 0FVT=B0<, O:V ?@89<0NBL ?@5?0@0B C?@>4>26 B@820;>3> G0AC, C 28?04:C
?>O28 1C4L-O:8E >7=0: 01> A82V A;V4 ?5@52V@8B8 @V25=L 35<>3;>1V=C 01> 35<0B>:@8BC.
0728G09 ?@5?0@0B =5 2?;820T =0 :V;L:VABL B@>1>F8BV2, ?@>B@>1V=>289 G0A 01> G0AB:>289
B@>1?>;0AB8=>289 G0A V =5 V=3V1CT 03@530FVN B@>1>F8BV2 ?@8 70AB>AC20==V C @5:>
<5=4>20=8E 4>70E.

@>=EV0;L=0 0AB<0 2 0=0<=57V. 0FVT=B8 V7 1@>=EV0;L=>N 0AB<N <>6CBL <0B8 «0A?V@8=>2C
0AB0AB>AC20==O 0A?V@8=C ?0FVT=B0<8 7 «0A?V@8=>2>N 0AB<N» 0A>FVN20;>AO 7 @>728B>:
< BO6:>3> 1@>=E>A?07 <>65 ?@8725AB8 4> ;5B0;L=>3> =0A;V4:C. A:V;L:8 C B0:8E ?0FVT=BV2,
GCB;828E 4> 0A?V@8=C, A?>AB5@V30;8AO 28?04:8 ?5@5E@5A=>W @50:B82=>ABV (2;:NG0NG8
1@>=E>A?07<) < B0 V=H8<8 , ?@5?0@0B =5 A;V4 70AB>A>2C20B8 ?0FVT=B0< 7 FVTN D>@<N
GCB;82>ABV 4> 0A?V@8=C, V 9>3> A;V4 7 >15@56=VABN 70AB>A>2C20B8 ?0FVT=B0< 7
1@>=EV0;L=>N 0AB<N 2 0=0<=57V.

01>@0B>@=V 0=0;V78. A:V;L:8 A5@9>7=V H;C=:>2>-.8H:>2V 28@07:8 V :@>2>B5GV<>6CBL
@>72820B8AO 70 2V4ACB=>ABV ?>?5@546C20;L=8E A82>-.8H:>2>W :@>2>B5GV. 0FVT=B0<, O:V
70AB>A>2CNBL ?@>BO3< B@820;>3> G0AC, A;V4 ?5@V>48G=> ?@>2>48B8 7030;L=89 V 1V>EV2V.
@07V 715@565==O 01> 71V;LH5==O 2V4E8;5==O 2V4 =>@<8 ?>:07=8:V2 ?5GV=:>28E 01> =8@:>28E
?@>1 70AB>AC20==O ?@5?0@0BC A;V4 ?@8?8=8B8.

:>=B@>;L>20=8E ;V=VG=8E 4>A;V465==OE ?V428I5==O @V2=O 07>BC A5G>28=8 :@>2V
A?>AB5@V30;>AO G0ABVH5 C ?0FVT=BV2, O:V 70AB>A>2C20;8 F5;5>:A81, ?>@V2=O=> 7
?0FVT=B0<8, O:V >B@8. "0:5 2V4E8;5==O ?>:07=8:V2 ;01>@0B>@=8E 0=0;V7V2 2V4 =>@<8 B0:>6
A?>AB5@V30;>AO C ?0FVT=BV2, O:V >B@8A;V465==OE O: ?@5?0@0B8 ?>@V2=O==O. ;V=VG=0
7=0GCIVABL FL>3> 2V4E8;5==O ?>:07=8:V2 2V4 =>@<8 =5 287=0G5=0.

0?0;5==O. \$0@<0>;>3VG=0 0:B82=VABL ?@5?0@0BC I>4> 7<5=H5==O 70?0;5==O V, <>6;82>,
7=865==O ?V428I5=>W B565 ?>A;01;N20B8 FV 4V03=>AB8G=V >7=0:8 ?@8 28O2;5==V V=D5:FV9=8E
CA;:04=5=L C 28?04:0E, :>;8 V=D5:FVO =5 ?V4>7@NTBLAO, O: ?@8G8=0 1>;N.

!C?CB=T 70AB>AC20==O . @5?0@0B =5 A;V4 70AB>A>2C20B8 >4=>G0A=> 7 =50A?V@8=>28<8 C
1C4L-O:8E 4>70E G5@57 ?>B5=FBV9=5 ?V428I5==O @878:C @>728B:C ?>1VG=8E @50:FBV9.
0AB>AC20==O ?0FVT=B0< ;VB=L>3> 2V:C !5@54 7030;L=>W :V;L:>ABV ?0FVT=BV2, O:V >B@&A81
C ;V=VG=8E 4>A;V465==OE, 1V;LH =V6 3300 >AV1 1C;8 2V:×
65-74 @>:8, B>4V O: 2V: I5 ?@81;87=> 1300 ?0FVT=BV2 AB0=>282 75 @>:V2 V 1V;LH5.=0G=>W
@V7=8FV 2 5D5:B82=>ABV 4;O F8E ?0FVT=BV2 V <>;>4H8E ?0FVT=BV2 =5 A?>AB5@V30;>AO. #
;V=VG=8E 4>A;V465==OE, 2 O:8E ?>@V2=N20;8 DC=:FVN =8@>: 70 4>?><>3>N 28ABV ;C1>G:>2>W
DV;LB@0FVW, @V2=O 07>BC A5G>28=8 :@>2V B0 :@50B8=V=C, 0 B0:>6 DC=:FVN B@>1>F8BV2 70
4>?><>3>N 287=0G5==O G0AC :@>2>B5GV B0 03@530FVW B@>1>F8BV2, >B@8<0=V @57C;LB0B8
=5 2V4@V7=O;8AO 4;O 4>1@>2>;LFV2 ;VB=L>3> 2V:C B0 <>;>48E 4>1@>2>;LFV2. 4=0.; O: V C
28?04:C 7 V=H8<8 , C B. G. , I> A5;5:B82=> V=3V1CNBL&□-2, :V;L:VABL A?>=B0==8E ?>2V4×;5=L
?@> ?>1VG=V @50:FVW 7 1>:C H;C=:>2>-.8H:>2>3> B@0:BC 7 ;5B0;L=8< =0A;V4:× V 3>AB@C
=8@:>2C =54>AB0B=VABL 1C;0 1V;LH>N A5@54 ?0FVT=BV2 ;VB=L>3> 2V:C, =V6 A5@54<>;>4H8E
?0FVT=BV2.

5GV=:>20 =54>AB0B=VABL. 0FVT=B0< 7 ?5GV=:>2>N =54>AB0B=VABN A5@54=L>3> ABC?5=O (:;0A
70 H:0;>N '09;40-N) @5:×<5=4>20=C 4>1>2C 4>7C ?@5?0@0BC C :0?AC;0E A;V4 7<5=H8B8 =0 50 %. 5
@5:×<5=4CTBLAO 70AB>A>2C20B8 ?@5?0@0B ?0FVT=B0< 7 BO6:>N ?5GV=:>2>N =54>AB0B=VABN.
8@:>20 =54>AB0B=VABL. 5 @5:×<5=4CTBLAO 70AB>A>2C20B8 ?@5?0@0B ?0FVT=B0< 7 BO6:>N
=8@:>2>N =54>AB0B=VABN.

0FVT=B8 7 ?>2V;L=8< <5B01>;V7<>< AC1AB@0BV2 V7>D5@<5=BC CYP2C9. !;V4 7 >15@56=VABN
70AB>A>2C20B8 F5;5>:A81 ?0FVT=B0< 7 ?V4B25@465=8< 01> ?V4>7@N20=8< (=0 >A=>2V
@57C;LB0BV2 4>A;V465==O 35=>B8?C 01> 0=0<=5AB8G=8E 40=8E I>4> V=H8E AC1AB@0BV2
V7>D5@<5=BC CYP2C9 (B0:8E O: 20@D0@8=, D5=VB>W=) ?>2V;L=8< <5B01>;V7<>< AC1AB@0BV2
V7>D5@<5=BC CYP2C9. ;O ?0FVT=BV2 7 ?>2V;L=8< <5B01>;V7<>< (B>1B> 7 35=>< CYP2C9*3/*3)
A;V4 @>73;O=CB8 <>6;82VABL @>7?>G0B8 ;V:C20==O 7 ?>;>28=8 =09<5=H>W @5:×<5=4>20=>W
4>78. ;O ?0FVT=BV2 7 N25=V;L=8< @52<0B>W4=8< 0@B@8B><, O:V <0NBL ?>2V;L=89<5B01>;V7<
AC1AB@0BV2 V7>D5@<5=BC CYP2C9, A;V4 @>73;O=CB8 <>6;82VABL ?@>2545==O
0;LB5@=0B82=>3> ;V:C20==O.

@5?0@0B 7C, I> A;V4 2@0E>2C20B8 ?0FVT=B0< V7 @V4:VA=8<8 A?04:>28<8 D>@<0<8 =5?5@5=>A8
<>ABV 30;0:B>78, =54>AB0B=VABN ;0:B078, A8=4@>×< 3;N:>7>-30;0:B>7=>W <0;L01A>@1FVW.

0AB>AC20==O C ?5@V>4 203VB=>ABV 01> 3>4C20==O 3@C44N.

03VB=VABL. @5?0@0B =5 A;V4 70AB>A>2C20B8 =0 ?V7=VE B5@ABV, ?>G8=0NG8 7 30-3> B86=O,
>A:V;L:8 2V= <>65 A?@8G8=8B8 ?5@54G0A=5 70:@8BBO 0@B5@V0;L=>W ?@>B>:8.
0B53>@VO ! 157?5G=>ABV 70AB>AC20==O ?@5?0@0BC C ?5@V>4 203VB=>ABV. 0B53>@VO D
157?5G=>ABV 70AB>AC20==O ?@5?0@0BC ?@8 203VB=>ABV, ?>G8=0NG8 7 30-3> B86=O
203VB=>ABV.

>A;V465=L 70 CG0ABN 203VB=8E 6V=>: =5 ?@>2>48;>AO. @5?0@0B A;V4 70AB>A>2C20B8 ?V4 G0A
203VB=>ABV ;8H5 B>4V, :>;8 ?>B5=FBV9=0 :>@8ABL 2V4 9>3> 70AB>AC20==O 28?@024>2CT
?>B5=FBV9=89 @878: 4;O ?>;>40.

>A;V465=L 7 >FV=:8 2?;82C F5;5>:A81C =0 70:@8BBO 0@B5@V0;L=>W ?@>B>:8 C ;N48=8 =5
?@>2>48;>AO. ">A>2C20B8 ?V4 G0A III B@8<5AB@C 203VB=>ABV.

?;82 ?@5?0@0BC =0 ?5@59<8 B0 ?>;>38 C 203VB=8E 6V=>: =52V4><89.

>4C20==O 3@C44N. @5?0@0B A;V4 7 >15@56=VABN 70AB>A>2C20B8 6V=:0<, O:V 3>4CNBL
3@C44N.

**40B=VABL 2?;820B8 =0 H284:VABL @50:FVW ?@8 :5@C20==V 02B>B@0=A?>@B× 01> V=H8<8
<5E0=V7<0<8. V4 G0A 70AB>AC20==O F5;5>:A81C ?@8 28=8=5==V B0:8E =51060=8E @50:FV9 O:
70?0<>@>G5==O, 25@B83> 01> A>=;82VABL A;V4 CB@8@0=A?>@B>< 01> 2V4 @>1>B8 7 V=H8<8
<5E0=V7<0<8.**

**!>AV1 70AB>AC20==O B0 4>78. 5@54 ?@89=OBBO< @VH5==O ?@> 70AB>AC20==O ?@5?0@0BC
A;V4 @5B5;L=> 72068B8 ?>B5=FBV9=C :>@8ABL V @878:8 70AB>AC20==O ?@5?0@0BC B0 V=H8E
20@V0=BV2 ;V:C20==O. □>6=>:@5<>A>2C20B8 =09<5=HC 5D5:B82=C 4>7C ?@>BO3×<
=09:>@>BH>3> ?5@V>4C G0AC 2V4?>2V4=> 4> FV;59 ;V:C20==O.**

@5?0@0B <>6=0 70AB>A>2C20B8 =570;56=> 2V4 ?@89>
AB5>0@B@8B. ;O ?>A;01;5==O >7=0: V A8AB5>0@B@8BC @5:><5=4>20=0 4>70 ?@5?0@0BC
AB0=>28BL 200 <3 =0 4>1C B0 <>65 70AB>A>2C20B8AO >4=>:@0B=> 01> 42VGV =0 4>1C ?> 100 <3.
52<0B>W4=89 0@B@8B. ;O ?>A;01;5==O >7=0: V A8
=:V;>7CNG89 A?>=48;VB. ;O ;V:C20==O >7=0: V A87CNG>3> A?>=48;VBC @5:><5=4>20=0 4>70
?@5?0@0BC AB0=>28BL 200 <3 =0 4>1C B0 <>65 70AB>A>2C20B8AO >4=>:@0B=> (1 @07 =0 4>1C)
01> 1CB8 @>7?>4V;5=>N =0 2 ?@89<>8 (42VGV =0 4>1C). 0 2V4ACB=>ABV 5D5:BC G5@57 6 B86=V2
;V:C20==O 20@B> A?@>1C20B8 70AB>AC20B8 4>1>2C 4>7C 400 <3. 0 2V4ACB=>ABV 5D5:BC G5@57
6 B86=V2 70AB>AC20==O ?@5?0@0BC C 4>7V 400 <3 =0 4>1C ;V:C20==O, H284H5 70 2A5, T
=55D5:B82=8<, V A;V4 @>73;O=CB8 <>6;82VABL 70AB>AC20==O 0;LB5@=0B82=8E 284V2 ;V:C20==O.
V:C20==O 3>AB@>3> I>;NV ?5@28==>W 48A<5=>@5W. >G0B:>20 @5:><5=4>20=0 4>70
?@5?0@0BC AB0=>28BL 400 <3. 0 =5>1EV4=>ABV C ?5@H89 45=L <>6=0 70AB>AC20B8 4>40B:>2C
4>7C ?@5?0@0BC, I> AB0=>28BL 200 <3. # =0ABC?=V 4=V @5:><5=4>20=0 4>70 AB0=>28BL 200 <3
42VGV =0 4>1C 70 ?>B@518.

A>I;82V 3@C?8 ?0FVT=BV2.
0FVT=B8 7 ?5GV=:>2>N =54>AB0B=VABN. ;O ?0FVT=BV2 7 ?5GV=:>2>N =54>AB0B=VABN
A5@54=L>3> ABC?5=O (:;0A 70 H:0;>N '09;40-N) @5:><5=4>20=C 4>1>2C 4>7C ?@5?0@0BC A;V4 7
<5=H8B8 =0 50 %. 5 @5:><5=4>20=0 4>70 AB0=>28BL 200 <3. # =0ABC?=V 4=V @5:><5=4>20=0 4>70
?@5?0@0B ?0FVT=B0< 7 B06:>N
?5GV=:>2>N =54>AB0B=VABN.

0FVT=B8 7 ?>2V;L=8< <5B01>;V7<< AC1AB@0BV2 V7>D5@<5=BC CYP2C9. !;V4 7 >15@56=VABN
70AB>A>2C20B8 F5;5>:A81 ?0FVT=B0< 7 ?V4B25@465=8< 01> ?V4>7@N20=8< (=0 >A=>2V
@57C;LB0BV2 4>A;V465==O 35=>B8?C 01> 0=0<=5AB8G=8E 40=8E I>4> V=H8E AC1AB@0BV2 CYP2C
9 (B0:8E O: 20@D0@8=, D5=VB>W=)) ?>2V;L=8< <5B01>;V7<< AC1AB@0BV2 V7>D5@<5=BC CYP2C
9. ;O ?0FVT=BV2 7 ?>2V;L=8< <5B01>;V7<< (B>1B> 7 35=>< CYP2C9*3/*3) A;V4 @>73;O=CB8
<>6;82VABL @>7?>G0B8 ;V:C20==O 7 ?>;>28=8 =09<5=H>W @5:><5=4>20=>W 4>78. ;O ?0FVT=BV2 7
?>2V;L=8< <5B01>;V7<< 7 N25=V;L=8< @52<0B>W4=8< 0@B@8B< A;V4 @>73;O=CB8 <>6;82VABL
?@>2545==O 0;LB5@=0B82=>3> ;V:C20==O.

VB8. @5?0@0B =5 ?>:070=89 4;O 70AB>AC20==O 4VBO

5@54>7C20==O. !8<8, O:V 7O2;ONBLAO ?VA;O 3>AB@>3> ?5@54>7C20==O , 70728G09 >1
<56CNBLAO 7030;L<>20=VABN, A>;=82VABN, =C4>B>N, 1;N20==G V 1>;5< 2 5?V30AB@0;L=V9
4V;O=FV, B0 7030;>< <0NBL >1>@>B=89 E0@0:B5@ ?@8 ?@>2545==V ?V4B@83> ;V:C20==O. >65
28=8:=CB8 H;C=:>2>-.8H:>20 :@>2>B5G0. >6CBL A?>AB5@V30B8AO 0@B5@V0;L=0 3V?5@B5=7VO,
3>AB@0 =8@:>20 =54>AB0B=VABL, ?@83=VG5==O 48E0==O B0 :>0, 0;5 C ?>>48=>:8E 28?04:0E. @8
B5@0?52B8G=>AC20==V ?>2V4<<;O;8 ?@> @>728B>: 0=0DV;0:B>W4=8E @50:FV9, O:V B0:>6
<>6CBL 28=8:0B8 ?@8 ?5@54>7C20==V.

@8 ?5@54>7C20==V ?0FVT=B0< A;V4 ?@>2>48B8 A8<0B8G=5 B0 ?V4B@8BV2 =5 VA=CT. □=D>@
<0FVW I>4> 282545==O F5;5>:A81C H;OE<< 35<>4V0;V7C =5 >B@8<0=>, 0;5, 72060NG8 =0 9>3>
28A>:89 ABC?V=L 72O7C20==O 7 1V;:0<8 ?;07<8 :@>2V (>97 %), <0;>9<>2V@=>, I> 4V0;V7 1C45
:>@8A=8< C 28?04:C ?5@54>7C20==O. @>B03<< 4 3>48= ?VA;O ?5@>@0;L=>3> ?@89>7C20==V
<>6=0 A?@>2>:C20B8 1;N20==O V/01> ?@87=0G8B8 0:B82>20=5 2C3V;;O (60-100 3 4>@>A;8<) V/01>
>A<>B8G=5 ?@=>A=5. '5@57 28A>:89 ABC?V=L 72O7C20==O ?@5?0@0BC 7 1V;:0<8 ?;07<8 :@>2V
D>@A>20=89 4VC@57, ?V4;C65==O A5GV, 35<>4V0;V7 01> 35<>?5@DC7VO <>6CBL 1CB8
=55D5:B82=8<8.

>1VG=V @50:FVW.

I>:C H;C=:>2>-.8H:>2>3> B@0:BC: 1V;L C 682>BV, 1V;L C 25@E=VE 4V;O=:0E 682>B0, 4V0@50,
48A?5?AVO, <5B5>@87<, =C4>B0, 70?>@, 4825@B8:C;VB, 48AD03VO, 2V4@86:0, 57>D03VB,
30AB@8B, 30AB@>5=B5@8B, 30AB@>57>D0350;L=89 @5D;N:A, 30AB@>57>D0350;L=0 @5D;N:A=0
E2>@>10, 35<>@>9, 3@860 AB@02>EV4=>3> >B2>@C 4V0D@03<8, <5;5=0, ACEVABL C @>BV, AB>
<0B8B, B5=57<8, 1;N20==O, :8H:>20 =5?@>EV4=VABL, ?5@D>@0FVO :8H5G=8:0,H;C=:>2>-.8H:>20
:@>2>B5G0, :>;VB 7 :@>2>B5G5N, ?5@D>@0FVO AB@02>E>4C, ?0=:@50B8B, V;5CA, 0;L25>;O@=89
>AB8B ?VA;O 2840;5==O 7C10 (ACE0 ;C=:0).

I>:C A5@F52>-AC48==>W A8AB5<8: 703>AB@5==O 0@B5@V0;L=>W 3V?5@B5=7VW,

AB5=>:0@4VO, 70E2>@N20==O :>@>=0@=8E 0@B5@V9, V=D0@:B :0@40, 2V4GCBBO ?>A8;5=>3>
A5@F518BBO, B0EV:0@4VO, =5?@8B><=VABL, 70ABV9=0 A5@F520 =54>AB0B=VABL, DV1@8;OFVO
H;C=>G:V2, 5<1>;VO ;535=52>W 0@B5@VW, ?>@CH5==O <>7:>2>3> :@>2>>1V3C, ?5@8D5@8G=0
30=3@5=0, B@><1>D;51VB, 20A:C;VB, B@><1>7 3;81>:8E 25=, V=D0@:B 3>;>2=>3> <>7:C,
=5AB01V;L=0 AB5=>:0@4VO, =54>AB0B=VABL0>@B0;L=>3> ;:0?0=0, 0B5@>A::5@>7 :>@>=0@=8E
0@B5@V9, A8=CA>20 1@048:0@4VO, 3V?5@B@>DVO H;C=>G:0.

030;L=V: 703>AB@5==O 0;5@3VW, 0;5@3VG=0 @50:FVO, 1V;L C 3@C4OE, :VAB0;VAB0 OTG=8:0,
35=5@0;V7>20=V =01@O:8, =01@O: >1;8GGO, H284:0 2B<;N20=VABL, ?V428I5==O B5?>4V1=V A8<8,
1V;L, ?5@8D5@8G=89 1V;L, 1V;L C A?8=V, ?5@8D5@8G=V =01@O:8, 28?04:>25 CH:>465==O, A5?A8A,
@0?B>20 A<5@BL, 0=0DV;0:B>W4=0 @50:FVO, 0=3V>=52@>B8G=89 =01@O:: 2V4E8;5==O
;01>@0B>@=8E ?>:07=8:V2 2V4 =>@<8, 2;;NG0NG8 ?>4>265==O 0:B82>20=>3> G0AB:>2>3> B@>
<1?>;0AB8=>2>3> G0AC, =0O2=VABL 10:B5@VC@VW, ?>78B82=89 @57C;LB0B ?>AV2C :@>2V,
?V428I5==O 0@B5@V0;L=>3> B8A:C, 71V;LH5==O 22>W :8A;>B8 C :@>2V, ?V428I5==O 35
<0B>:@8BC, 2V4E8;5==O 2V4 =>@<8 ?5GV=:>28E ?@>1, =0O2=VABL ?@>B5W=C@VW, ?V428I5==O
@V2=O B@0=A0@<8 ?>:07=8:V2 7030;L=>3> 0=0;V7C A5GV.

I>:C F5=B@0;L=>W V ?5@8D5@8G=>W =5@2>2>W A8AB5<8: AC4<<8 C =>30E, 3>;>2=89 1V;L,
3V?5@B5=7VO, 3V?5AB57VO,

I>:C >@30=V2 7>@C: ?;020NGV ?>3> BV;0, :=N=:B820;L=89 :@>2>28;82.

I>:C >@30=V2 A;CEC B0 25AB81C;O@=>3> 0?0@0BC: 3;CE>B0, HC<C 2CE0E, ;01V@8=B8B.

I>:C ?5GV=:8 B0 6>2G>284V;L=>W A8AB5<8: ?>@CH5==O DC=:FVW ?5GV=:8, ?V428I5==O @V2=O
!", ?V428I5==O @V2=O !", 6>2G=>:0<O=0 E2>@>10, 35?0B8B, 6>2BO=8FO, ?5GV=:>20
=54>AB0B=VABL

>@CH5==O <5B01>;V7 ?V428I5==O @V2=O 07>BC A5G>28=8 :@>2V, ?V428I5==O @V2=O \$,
3V?5@E>;5AB5@8=5:0;VT2>3> 07>BC, 71V;LH5==O 2W D>AD0B078, 71V;LH5==O <0A8 BV;0,
3V?>3;V:5=0B@VT7=865==O 2AB5@>=C C :@>2V.

I>:C >?>@=>-@CE>2>3> 0?0@0BC: 0@B@0;3VO, 0@B@>7, 2VWB, B5=48=VB8, 5?V:>=48;VB,
@>7@82 ACE>68;;O.

I>:C ?A8EV:8: 0=>@5:AVO, B@82>6=VABL, ?V428I5==O 0?5B8BC, 45?@5AVO, =5@2>7=VABL,
A>;82VABL, 157A>==O, 0B0:AVO, A@>3C1AB2>, 0A5?B8G=89 <5=V=3VB, 03527VO, 0=>A;5B0;L=89
2=CB@VH=L>G5@5?>89 :@>2>28;82.

I>:C A8AB5<8 :@>2V: 7=865==O @V2=O 35<>3>;1V=C, 0=55:EV<>7, =>A>20 :@>2>B5G0, B@>
<1>F8B5B@><1>F8B>?5=VO, 03@0=C;>F8B>7, 0?;0AB8G=0 0=5?5=VO, ;59:>?5=VO.

I>:C 48E0;L=>W A8AB5<8: 1@>=EVB, 1@>=E>A?0?<, 703>AB@5==O 1@>=E>A?0?

I>:C H:V@8 B0 ?V4H:V@=>W B:0=8=8: 0;>?5FVO, 45@<0B8B, @50:FVO D>B>GCB;82>ABV,
A25@1V6, 28A8?0==O (C B. G. 5@8B5<0B>7=V, <0:C;>?0?C;L>7=V), 7:C H:V@8, ACEVABL H:V@8,
?V428I5=5 ?>B>284V;5==O, :@>?82O=:0, @<=0 5@8B5<0, 5:AD>;V0B82=89 45@<0B8B, A8=4@<<
!BV25=A0-6>=A>=0, A8=4@<< 09T;;0, <548:0<5=B>7=5 28A8?0==O, I> AC?@>2>46CTBLAO
5>78=>DV;VTN V A8AB5<=8<8 ?@>O20<8 (DRESS-A8=4@<< 01> A8=4@<< ?V428I5=>W
GCB;82>ABV).

>@CH5==O C AC20==O ?@5?0@0BC: F5;N;VB, :=B0:B=89 45@<0B8B.

I>:C A5G>284V;L=>W A8AB5<8: 0;L1CV=B5@AB8FV0;L=89 =5D@8B.

"5@ABV.3 @>:8.

#<>28 715@V30==O. 15@V30B8 2 >@83V=0;L=V9 C?0:>2FV ?@8 B5□.
15@V30B8 C =54>ABC?=>

#?0:>2:0. 0?AC;8 10, 10E2 C 1;VAB5@0E C :>@>1FV|

0B53>@VO 2V4?CA:C. 0 @5F5?B>

8@>1=8:. "«\$0@<0F52B8G=0 :>@>2□O».

VAF57=0E>465==O 28@>1=8:0 B0 9>3> 04@5A020465==O 4VO;L=>ABV.

#: @0W=0, 61013,