71{´(R) (ower)+ 1.3.33 ¤vi ri<+/-C]ÅPx (Electrician) - +/-i <+/-C]ÅE+/- +|i(R)v E rxi +(R) |i(R)vE E |E(R) (Laws of resistance and various types ofresistors)=qP : < {` E +xi +{ Vx EM :*|i(R)v E x E ¤ix il ´z {nl E |i(R)v E i+/-x E(R)x*EbC](R) E |i(R)v +(R) ´ E ¤S ¤v ¤ix*n M b] (x + +n) EbC](R) E |i(R)v +(R) ´ E Mhx E(R)x*´z |E(R) E |i(R)v E ´J E(R)x *|i(R)v E x (Laws of resistance): BE S+/-E u(R) =i{z|i(R)v R xx E(R)E {(R) x(R) E(R)i **S+/-E E |i(R)v ´r =E +/-¤< E x{i i **S+/-E E |i(R)v =E +x|l E] E Ij¡+/- E ´iGx{ii **S+/-E E |i(R)v =E {nl {(R) x(R) E(R)i * V E ¤xi ** S+/-E E i{ {(R) x(R) E(R)i *+ +xi E(R)E E +xnJ E(R)E E Ei E Va = RLV (rho - OE E ´h) - l(R) V ExbE](R) E {nl E Mh{(R) x(R) +(R) =E ´P¹] (R)]x (resistance) +l´|i(R)Ei (resistivity) E deg{ Vx Vi *n +/-¤< 1](R) +(R) Ij¡+/- 'a' = 1m2 i R = r<+/- E {nl E ´P¹` |i(R)v = {nl E 1 x](R) E´{(R)i {P´ E ¤S |i(R)v E deg{ {(R)¹i E V Ei* (+l´ E BEE x E = {nl E x cm +/-i *)(Fig 1)´xx {nl E |i(R)v E i+/-x (Comparison of theresistance of different materials) : ´ti E S+/-E E deg{ +vE i´{h {nl E +/- (Fig 2) EU i+/-xiE Sx |nxE(R)i * |nÌPi S+/-E x +x|l E] E Ij¡+/- ilx |i(R)v E * Sn E i(R) ¤ +vE V¤E i¤ E EUE +(R) B+/-x E +(R) E *]+/- i(R) E i+/-x Sn E i(R) {S Mx +vE +/-¤ * SE ´z vi ´z S+/-Ei xv(R)h E i =xE |i(R)vxv(R)h z x S ´z vi+ E |i(R)v xv(R)h,´ti {(R){l |iE vi E BE xE]Eb |M E(R)E YiE V Ei * n +{ +vE v(R)h vi+ E BE xE+E(R) E]Eb E E] E(R) =x BE ¤](R) BE BE E(R)E Vb i+{E Yi M E =x ´z j E v(R) |´i M*(Fig 3) Yi E LaR=jE E SI {ri metre Lohm R x metre a2= metreohmLaR=<+/- ´P¹` |i(R)v E jE Ohm meter (m) i *i¤ E i+/-x EU v(R)h vi+ E |i(R)v (Fig 4) UcO¡ u(R) |nÌPi E M * Sn i¤ E i+/-x =k S+/-E *CE < |i(R)v E i * x<G E |i(R)v i¤ Ei+/-x 60 Mx * <+/- n <xE BE ¤](R) BE BE E(R)E(c) NIMI NOT TO BE REUBLISHED

72Vc V i x<G E i+/-x i¤ 60 Mx +vE v(R)|´i E(R)M* |i(R)vE (Resistors)=qP : < {` E +xi +{ Vx EM :*´z |E(R) E |i(R)vE E (R)Sx il ´P¹i+ E ´hx E(R)x*v(R)h i: E Ei E BE n M< +/-¤< E S+/-E E|i(R)v =E +x|l E] E Ij¡+/- E ´iGx{i i *(Fig 5) {´(R) : <+/-C]ÅPx (NSQF Pvi - 2022) - + 1.3.33 ¤vi rin(R) E(R)E V |i(R)v E |´i E(R)i {nl E |Ei <+/- +¤ E Ei E i(R) E |i(R)v* arealength = x +/-¤< /Ij¡+/- x (n M {nl) metre a(metres) L = R(ohms)2< = Ra L Ohm - meterV (OE +I(R) =SS(R)h (R)), BE l(R)E ´H E(R)i *L i(R) E](R) +/-¤< a ´M](R) Ij¡+/- ¤ BE v(R)h Elx E E(R) Ei ; i(R) Vix ¤cM, =E |i(R)v =ix E M; i(R) E G CPx+/- IjVix U] M, =E |i(R)v =ix +vE M *<E ´jE x I{i E(R) Ei : E vi S+/-EE ´ti |i(R)v =E +x|l E] E Ij¡+/- E ´iGx{i i* |i(R)vE

(Resistors): <+/-C]ÅxE {(R){l ={M x ´+/-¤ x x¹G (assive)]E * |i(R)vE E +À (|i(R)v)E ´P¹] x E l ¤x Vi * {(R){l |i(R)vE ={ME(R)x E =qP i v(R) E ´P¹] x iE i E(R)x ´Ui ´+/-]i {ix (IR) ={+/-¤v E(R)x * |i(R)vE E PCixv(R)h (rating) 0.1W Eb ´] iE Ei *|i(R)vE {ÄS |E(R) E i :1i(R)-Eb+/-i |i(R)vE (Wire-wound resistors)2E¤x Vx |i(R)vE (Carbon composition resistors)3vi ¡+/- |i(R)vE (Metal film resistors)4E¤x ¡+/- |i(R)vE (Carbon film resistors)5´P¹ |i(R)vE (Special resistors)1i(R)-Eb+/-i |i(R)vE (Wire-wound resistors)i(R)-Eb+/-i |i(R)vE E (R)E {+/-x, ¤E+/-<], n¤ {{(R)<in V (R)vi E(R) ES(R) i(R)¡ |i(R)v i(R) (x<G xExE+/--G ¸h) E Eb+/-i E(R) ={M E(R)i B ¤xB Vi *Fig 1 < |E(R) E |i(R)vE nP M * <E< ={ME M +x +´hi (bare) i(R) xi: ´ti(R)v {nl {(R)¤r (R)i * i(R)-Eb+/-i |i(R)vEi =SS v(R) E +x|M E+/-B ={M EB Vi * BE ´] 100 ´] +vE * 2E¤x Vx |i(R)vE (Carbon composition resistors) ´Ui |i(R)v E x E +/-B +´PE +x{i I E¤x ¤vE E deg{ Sh ´ti(R)v O E l ¸i O¡<b Fig 5(c) NIMI NOT TO BE REUBLISHED

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73¤xB Vi * Fig 2 E¤x Vx |i(R)vE E (R)Sx nPM< *E¤x |i(R)vE 1 +À 22 M+À E x +/-i *E¤x ¡+/- |i(R)vE 1 +À 10 M+À il 1W iE +/-i, il 85 degC 155 degC iE E E(R) Ei *|i(R)vE E =xE E E {I ´MEi E V Ei V1 l(R) |i(R)vE2{(R)´i |i(R)vEl(R) |i(R)vE (Fixed resistors): l(R) |i(R)vE ´ V,|i(R)vE E xj x l(R) i * <x |i(R)vE BE VbÃ+/-bÃ E ´´l (R)i * (Fig 1 4){(R)´i |i(R)vE (Variable resistors) (F i g 5): {(R)´i|i(R)vE ´ , VxE x E {(R)´ii E V Ei * {(R)´i|i(R)vE ´]E +/-i i Vx { {E E i |i(R)v x E ´z i(R) {(R)] E V Ei * <x´´](R) |i(R)vE (R)+/- deg{ ´´](R) Ei *|i(R)v i{, ´+/-]i, |EP {(R) x(R) E(R)i (Resistancedepends upon temperature, voltage light): ´P¹|i(R)vE ¤xB Vi , VxE |i(R)v i{, ´+/-]i il |EPE l {(R)´ix i * {´(R) : <+/-C]ÅPx (NSQF Pvi - 2022) - + 1.3.33 ¤vi ri3vi ¡+/- E |i(R)vE (Metal film resistors) (Fig 3)vi ¡+/- |i(R)vE, n |G ¤x Vi *] ¡+/- |i(R)vE,vi ¸ il Sh EÄS E l +/-{i EB Vi V (R)E+v(R) ¡+/- E(R) {E Vi * (Fig 3)vi ¡+/- |i(R)vE 1 +À 10M iE 1 W +/-i *4 E¤x ¡+/- |i(R)vE (Carbon film resistors) (Fig 4)< |E(R) , (R)E +v(R)/]¬¤ {(R) E¤x E {i+/- {(R)i Exl{i E Vi * {z E +/-¤< E ¤fÃx E +/-B {¹`E >{(R)´P¹] |G u(R) BE Ì{+/- JS E] Vi *|i(R)vE E +/-B SxEx Eb (Marking codes for resistors)=qP : < {` E +xi +{ Vx EM :*|i(R)vE {(R) (R)M E Ebi +Ex E ´J E(R)x*|i(R)v E x E +/-B +I(R) il J Eb E ´J E(R)x*|i(R)vE E +/-B ´(R)i x E S ¤xx *(R)M Eb E B |i(R)vE E |i(R)v il ¹hi (]+/-(R)) E x (Resistance and tolerance value of colour codedresistors)´{(R)E deg{ |i(R)v E x il ¹hi (]+/-(R)) E x,(R)M E Eb +I(R) il +EE Eb |i(R)vE {(R) +Ei(R)i *x E Ei E(R)x E +/-B (R)M E Eb E

n lE +E il]+/-(R) E IS 8186 E +x(R)]¤+/- 1 n MB *(c) NIMI NOT TO BE REUBLISHED

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74]¤+/- 1(R)M E Mi E lEi +E il]+/-(R) E x(R)M |l ui ii Sil¤hb/ ¤hb/ ¤hb/ ¤hb/b] b] b] b]|l uiMhE]+/-(R)+E +E(R)Vi---- 1 0-2+/- 10 %´h---- 1 0-1+/- 5 %E+/---0 1 -- -(R)111 0 +/- 1 %+/-+/-22 1 02+/- 2 %x(R)M33 1 03---{+/-44 1 04---(R)55 1 05---x+/-66 1 06---¤Mx77 1 07---v(R)88 1 08---¡n99 1 09---E< x---- -- +/- 2 0 %n lE +E il]+/-(R) (R)M Eb |i(R)vE Fig 1 nP MB+x(R) E (¤b) {(R) (R)M E +/-{x E B 4 ¤hb i *|l ¤hb |i(R)vE]E E BE (R) E xE] Ei * ui,ii B´ Sil (R)M E ¤hb Fig 1 nP MB *|l n (R)M E ¤hb, |i(R)v E +EE x |l n +E EEi E(R)i * i(R) (R)M, ¤hb MhE E Ei E(R)i * ´i´E|i(R)v x E Yi E(R)x E +/-B |l n +E E MhE MhE Vi * (R)M E Sl ¤hb]+/-(R) E |iPi Ei E(R)i*=n(R)h|i(R)v E x (Resistance value) : n |i(R)vE (R)M E¤hb, < G i +/-+/-, (R), i(R) il ´h i|l (R)M ui (R)M ii (R)M Sil (R)M+/-+/-¤Mxx(R)M ´h 2 7 1000(103) +/- 5 %|i(R)vE E x 27,1000 +À , + 5% ¹hi (]+/-(R)) El]+/-(R) (¹hi) E x (Tolerance value): Sl ¤hb(]+/-(R)), |i(R)v E {(R) E Ei E(R)i , V =E ´i´Ex * ={(R)Ci =n(R)h]+/-(R) (U]) + 5% * 27000 E+5% 1350 +À * <+/-B |i(R)vE E x 25650 +À il28350 +À E ¤S E x E M* ¹hi (]+/-(R)) Exx x E |i(R)vE (I) v(R)h x E |i(R)vE Mi *+/- +(R) v |i(R)v E {x (Methods of measuring low and medium resistance)=qP : < {` E +xi +{ Vx EM :*|i(R)v {x E ´xx ´v E x ¤ix*B](R) +(R) ´+/-]](R) ´vÄ E ´hx E(R)x * {´(R) : <+/-C]ÅPx (NSQF Pvi - 2022) - + 1.3.33 ¤vi ri+/- |i(R)v {x E ´v (Methods of measuring lowresistance) : +/- |i(R)v E {x |H xx ix ´v +/-Vi **´+/-]](R) +(R) B](R) ´v*´´](R) u(R) xE +Yi E i+/-x ´v*E+/-´x JPYV*Px] |E(R) E +](R)B](R) +(R) ´+/-]](R) ´v (Ammeter and voltmetermethod) : ´v (R)+/- ´v * +(R) +/- |i(R)v E{x E +/- +ivE |M +/- Vi *Fig 1 Rm { Vx ´+/- |i(R)v +(R) RV |i(R)v E V BE=SS ´+/-]](R) * l n¹] v(R) +{Ìi BE v(R) R i< ¸h BE ={H B](R) Vi * +¤ x E +Yi|i(R)v ´ v(R) V E B](R) A E u(R) { M< * Exx j u(R) reading Ammeterreading Voltmeter = RmRm = Measured value(c) NIMI NOT TO BE REUBLISHED

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75v |i(R)v (Medium resistance) E {x E +/- xx ix´v |H i **(R)W ´M E +](R)*´+/-]](R) +(R) B](R) ´v*´]]x JPYV ´v+](R) (Ohmmeter)=qP : < {` E +xi +{ Vx EM :*¸h |E(R) E +](R) E rxi (R)Sx, +(R) ={M E ¤ix*Px] |E(R) E +](R) E rxi (R)Sx, +(R) ={M E ¤ix * {´(R) : <+/-C]ÅPx (NSQF Pvi - 2022) - + 1.3.33 ¤vi ri|i(R)v E {x (Measurement of resistances)v |i(R)v E {x, ={E(R) V E+/-´x JPYV, ´]]x JPYV,{h i(R)

JPYV, {] +¡ ¤C, +(R) + { Ei >{(R) E ={E(R) ´P¹ bV<x +/- |i(R)v E {x {(R)Pri Ei *+/-Ex =SS |i(R)v E {x E +/- M +](R) +l´ M(R)V ={E(R) |M +i *+](R) (Ohmmeter)+](R) BE B ={E(R) V |i(R)v {x E(R)i * + {n |E(R) E ¸h +](R), v |i(R)v E {x E +/-, +(R)Px] |E(R) E + { V +/- |i(R)v E {x |H i *+{x +/-E deg{ + { n BE +xi(R)E P¹E +/- BEMMC +/-](R) +(R) BE v(R) x |i(R)v i *E] +](R) E ={M E(R)x {+/-, |i(R)v { E +/-B,E] E(R)] E ¤n E(R) nx SB +(R) E] E <+/-C]Å+/-<]E E{](R) E bSV E Vx SB* n (R)JE +](R) E +{i E +{x (R)i i *¸h |E(R) +](R) : (R)Sx (Series type ohmmeter:construction)(R)Sx: BE ¸h |E(R) E + { Fig 1 E +x(R) J deg{ BE MMC (b+x´+/-) { M x |i(R)v R1 BE ¤](R) E+(R) A il B E +/- BE M+/-]Ìx+/- V +Yi |i(R)v RXE ¤xv x * +(R) { R2 E xi(R) BE Px] M |i(R)vi V EiE E Px li Vx E +/- ={M +/-Vi *Ex´x (Working)V¤ A +(R) B]Ìx+/- E +/- {li (+Yi |i(R)v RX = 0) E(R)n Vi {(R){l +vEi v(R) |´i i *](R) {hE+/- E(R)x] ¤x i * Px] |i(R)v R2 E Vx u(R) { E{h {x v(R) (Ifsd) {x E +/- ¤x Vi * EiE E {h{x v(R) li E {x {(R) Px +P SxEi E Vi *V¤ +](R) E +Oh (A +(R) B]Ìx+/-) J+/- i b+/- { E< v(R) |´i x i* < E(R)h](R) ´I{i x i+(R) EiE b+/- E ¤ +(R) (R)i * <+/- b+/- E ¤(R) +xxi (alpha) |i(R)v SxEi E Vi VE +l i E {(R)Ih +Oh E ¤S +xxi |i(R)v (J+/- |i(R)v) *A +(R) B]Ìx+/- Yi |i(R)v RX E ´z x E Vb E(R)b+/- vE SxEx ({x) E V Ei *+](R) E {(R)Pri +vEi(R) ¤](R) E li {(R) x(R) E(R)i* hb(R)x +l´ ={M ¤](R) E +xi(R)E |i(R)v v(R)v(R) E Ei * < E(R)h {h {x v(R) E Vi +(R)]Ìx+/- A +(R) B E +/- {lx x {(R) { Px x {fi *Fig 1 {(R)´i Px] |i(R)v R2 u(R) BE Vx |{i i Vxxi ¤](R) ´+/-]i |´ E x(R)x BE +xiMi E(R)Ei * n ¤](R) ´+/-]i BE E Vi R2 EVx Px Vx EiE E Px li {(R) x +/- VEi * i¤ ¤](R) E |il{x BE =k ¤](R) x S*Fig 2 E +x(R) { {x nx (R) {(R) Px +(R) ¤ +(R)+xxi + M*+ { BE +(R)JE {x i * CE |i(R)v +(R) v(R) ´iG ¤xv i ¡+/-´ deg{ Px E { ´ri {x +(R)+xi (R) {(R) xi {x i *Px] |E(R) +](R) (Shunt type ohmmeter)Fig 3 BE Px] |E(R) + { E {(R){l +(R)J nJ M *(c) NIMI NOT TO BE REUBLISHED

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76Ex´x (Working)V¤ A +(R) B E]Ìx+/- +/- {li i (+Yi |i(R)v RX = 0ohms) { v(R) Px i * n(R) +(R) n +Yi |i(R)vRX = alpha = (A +(R) B J+/-) i v(R) E´+/- { |´i i +(R) R1 x E =Si Sx EiE E {h {x {(R) {S VEi *<+/- Px] |E(R) E + { E Px Sx ¤ l E +(R) (v(R)Px) +(R) +zi Sx {x E nx l +(R) i * {h {x(´I{h v(R)) i * V E (Fig 4) nJ M * vx E |i(R)v {x u(R) |´ { |i(R)v +(R) +Yi|i(R)v E ´iG +x{i ´Vi i +(R) EiE v xli +/-i ={M (Use) : < |E(R) E + { +/- x |i(R)vE E {xE +/- ´P¹E(R) ={H i *< { ¤](R) E, MMC { Mi +(R) Px Vx E +/- Vx|i(R)v R1 E l ¸h Vb Vi * +Yi |i(R)v RX V]Ìx+/-A +(R) B E]Ìx+/- E (R) {(R) Vb Vi { E l xi(R){(R){l xÌi E(R)i * hb(R)x

¤](R) E x¹Ex E n(R) E(R)xE +/- EV S Ï|M (R)i {P ¤]x |E(R) E i * {´(R) : <+/-C]ÅPx (NSQF Pvi - 2022) - + 1.3.33 ¤vi riFig 4Fig 3(c) NIMI NOT TO BE REUBLISHED

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77{´(R) (ower)+ 1.3.34 ¤vi ri<+/-C]ÅPx (Electrician) - +/-i <+/-C]ÅE+/- +´]]x JPYV - rxi +(R) =E +x|M (Wheatstone bridge - principle and itsapplication)=qP : < {` E +xi +{ Vx EM :*´] ]x JPYV {(R){l E {(R)¹i, (R)Sx |E (Function) +(R) ={M ¤ix*´] ]x JPYV u(R) +Yi |i(R)v Yi E(R)x *´] ]x JPYV +Yi |i(R)v E Yi E(R)x E +/- (Fordetermining the unknown resistance by WheatstoneBridge):*JPYV ExCPx Vx ´+/- v(R) Px x S**+x ix |i(R)v E x `E-`E Yi x S*E Yi E(R) E JPYV ExCPx E< v(R) |´i x (R) ?(How to find no current flows through the bridgeconnection?) BE { xj V EU <GB{(R) (BE B{(R)E n +/-J´ M) E |´ E Ei n Ei V M+/-´x {Ei |H E Vi * 25 <GB{(R) u(R) {h {x ´SU{nx ´+/- M+/-´x{ *´´E ´]]x JPYV BE xi(R) |i(R)v EV H M+/-´x{i JPYV ExCPx E BE {P ¤]x n¤x Vi * < ={H{ E BE IbE ´SU{ E VS Ex l i * +vE ´SU{x {(R) {(R)´i |i(R)v E Vx E Vi * M+/-´x{ E Px]|i(R)vE E J+/- (R)J E(R) +xi +(R) ll Vx E Vi *JPYV E ix V xE/ll |i(R)vE E ¤x i * ´]]xJPYV u(R) {x lli E ´r E +/- {E |i(R)v E +i +/-(R)J Vi *l{ M+/-´x { E ={M JPYV ExCPx v(R) E Px VxE xPSi E(R)x i * +li JPYV ExC](R) u(R) Vc nx xi(R)PJ+ ´´ ¤xn i *< ´´l E x +´¹E(R)E E x {(R) (R)J M +(R) ´]]xJPYV E+/-i ´]]x JPYV +/-MM 1.0 ohm 1.0 M ohm {(R) E {x |H i * (Fig 1) |i(R)vE , Q +(R) S { xj E +xi(R)EM il R ´ +Yi |i(R)v VE {x E(R)x *{ xj E Vx +x{i Vx iE E Vi ´S E ¤xn li M+/-´x{ (R)ËbM E Px Vx <EEi i *|i(R)vE +(R) Q +x{i V E+/-i * +(R) Q E {n {(R)´Ìii E(R)i V |i(R)v x E BE {(R) |{i E+(R) S x E |i(R)v M nPE |i(R)v S u(R) xv(R)i EV E* (Fig 2)R = Q S Mh E Vi *Fig 1 Fig 2Q+x{i E Mhx E (R)+/-i E +/- 1,10, 100 +l´ 1000(R)J Vi *S {(R)´i |i(R)v * S(R) nPE |i(R)v E ¸h Vc B * SE x E S(R) nPE |i(R)v <E< E Vx u(R) BE + E{n 1.0 + 9999 + iE (R)J Vi *=n(R)h E +/-B = 10 ohm, Q = 100 ohm, S = 7ohm.i¤, (c) NIMI NOT TO BE REUBLISHED

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78{´(R) (ower)+ 1.3.35 & 1.3.36 ¤vi ri<+/-C]ÅPx (Electrician) - +/-i <+/-C]ÅE+/- +|i(R)v {(R) i{x ´´vi E |´ (Effect of variation of temperature on resistance)=qP : < {` E +xi +{ Vx EM :*S+/-E E ´ti |i(R)v Ex E(R)E {(R) x(R) E(R)i {¹] E(R)x*|i(R)v E i{x MhE (E-B¡B]) ¤ix *{nl E |i(R)v +vEP i{x {(R) x(R) E(R)i +(R) {nl E+x deg{ ¤n+/-i *V r BE l(R)E V S+/-E E {nl E |Ei +(R) ´P¹] |i(R)v+l´ |i(R)Ei E+/-i * i{ {(R)

|i(R)v E x(R)i xx ´i(R) {¹] E V (R) *|i(R)v {(R) i{x E |´ (Effect of temperature onresistance) : |i(R)v E +{IE x Vx {+/- ¤i M ´ vi+ E +/-MM E(R) E i{ {(R) n M * {nl E |i(R)v=SS +l´ +/- i{ {(R) {(R)´Ìii i *+vEi(R) V¤ {nl E i{ ´r i =E |i(R)v ´ri +/-Ex EU +x {nl i{ ´r x {(R) |i(R)v E i*|iE +P i{ {(R)´ix V {(R)h |i(R)v |´i i = i{ MhE Ei * P¤n vxiE +(R) @hiE i{ E |i(R)v ´r, E E |nÌPi E(R)i *V¤ i{ ´r {nl E |i(R)v ´r i i{ MhE vxiEi * Pr vi+ V Sn, i¤, B+/-x, {i+/- <inE +/- ={H * (Fig 1) EU ¸i vi+ V (R)E, Mxx <in E +/- i{ ´r BE |i(R)v ´r +{IEi E +(R) +xi i *V¤ i{ ´r {nl E |i(R)v E i <E i{ MhE @hiEi * (Fig 2) ´ti +{]¬, (R)vE V EMV, (R)¤(R), ES +SE <in {(R)+(R) S+/-E V E¤x {(R) +PE deg{ |´ *BE S+/-E E |i(R)v E i{ MhE (alphaalphaalphaalphaalpha) (Temperaturecoefficient of resistance (alphaalphaalphaalphaalpha) of a conductor) : x BEvi S+/-E R0 E 0 degC {(R) |i(R)v +(R) <E tC iE i{iE Vi * il < i{ {(R) |i(R)v Rt V x i{ {(R)E +/- |i(R)v ´r E +/- xx |{i i :*<E |(R)E |i(R)v E x{i *i{ ´r E x{i *S+/-E E {nl E |Ei {(R)<+/- (Rt Ro) = Ro t alpha.....(i)V alpha (B+/-¡) BE l(R)E V S+/-E E |i(R)v E i{ MhEEi *{x& ´´Si E(R)h +/-i t RR = t R R - R = alpha000tIf Ro= 1, t = 1 degC, then alpha = R = Rt Ro.<+/- {nl E i{ MhE E |i 0C i{ ´r E +/- |i +|i(R)v ´r u(R) {(R)¹i E V Ei *E(R)h (1) Yi i E RT = Ro(1+alpha t) .....(ii)|(R)E i{ {(R) alpha E x(R)i E nJi BE n M i{ {(R)|i(R)v E i{ MhE E n M i{ {(R) |i bO x]O] i