PHYSICS

BOOKS - TARGET PHYSICS (MARATHI ENGLISH)

SEMICONDUCTORS

Exercise

1. CONDUCTORS HAVE___electrical conductivity as conductivity as compared to insulators.

A. high

B. less

C. same

D. zero

Answer:

Watch Video Solution

2. OUT OF THE FOLL.semiconductors, which of them is an example of compound semiconductors?

A. germanium

B. silicon

C. calcium sulphide

D. polyaniline

Answer:

Watch Video Solution

3. when the temperature of a semiconductor is increased , its electrical conductivity___.

A. decreases

B. increases

C. does not change

D. initial decrease and later on decreases

Answer:

Watch Video Solution

4. metals are good conductors of heat as compared to the insulators because

A. they contain free electrons

B. tehir atoms are realtively far apart

C. their atoms collide frequently

D. they have reflecting surfaces

Answer:

Watch Video Solution

5. for a given solid,closely spaced energy levels of all electros in a particular orbit is called

A. valence band

B. energy band

C. conduction band

D. band gap

Answer:

6. in insulators,

A. the valence band is partially filled with electrons

B. the conducion band is partially filled with electrons

C. the conduction bamd is filed with electrons and valence band is empty

D. the conduction band is empty and the valene band is filed with electrons

Answer:

Watch Video Solution

7. the energy band gap is maximum in

A. metals

B. super conductors

C. insulators

D. semi conductors

Answer:

 Watch Video Solution

8. the band gap in germanium and silicon in eV are

A. 0.7,1.1

B. 1.1,0.7

C. 1.0,0

D. 0,1.1

Answer:

Watch Video Solution

9. the main distinction between conductors,semiconduct ors and insulators is concerned with

A. binding enegry of free electrons

B. width of forbidden energy band

C. work function of free electrons

D. temperature coefficient of resistance

Answer:

Watch Video Solution

10. if the temperature of a semi condutror is incressed, then the forbidden gp will

A. increase

B. remain same

C. decrease

D. vanish

Answer:

 Watch Video Solution

11. the most commonly used semi caonductors are

A. germanium and silicon

B. germanium and copper

C. silicon and glass

D. glass and ebonite

Answer:

Watch Video Solution

12. a pure semiconductor

A. has low resistance

B. is an intrinsic semiconductor

C. allows inadequate curren to pass through it

D. is an extrinsic semiconductor

Answer:

Watch Video Solution

13. thr ratio of no.of holes and no. of conduction electrons in an intrinsic semiconductor is

A. less than one

B. one

C. greater than one

D. infinity

Answer:

Watch Video Solution

14. at absolute zero temerature , a crystal of pure germanium

A. behaves a perfect conductor

B. behaves as perfect insulator

C. behaves as a semiconductor

D. contains no electron

Answer:

Watch Video Solution

15. which of the foll. Is NOT a 'donor' impurity?

A. bismuth

B. antimony

C. indium

D. arsenic

Answer:

Watch Video Solution

16. Pure silicon should be doped with which of the foll. Impurity atoms to make a p-type semiconductor?

A. arsenic

B. antimony

C. aluminium

D. germanium

Answer:

 Watch Video Solution

17. a n-type semiconductor is formed

A. when germanium crystal is doped with an impurity containing three valence electrons

B. when germanium crystal is doped with an imopurity containing five valencelectrons

C. from pure germanium

D. from pure silicon

Answer:

Watch Video Solution

18. Regarding p-type and n-type semiconductors,which of the foll..statements is true?

A. n-type semiconductors have free electrons in majority

B. n-tyoe semiconductors havwe holes in Majority

C. the concentration of electrons and hoes are equal in both n-type and p-type semiconductors

D. n-type semiconductor is obtained by dopins with travelent impurity

Answer:

 Watch Video Solution

19. a semiconductor is damaged by a strong current ,because of

A. excess of electrins

B. decrease in electrons

C. lack of free electrons

D. none of these

Answer:

Watch Video Solution

20. bond in n and p type semiconductor is

A. covalent

B. oionic

C. metallic bond

D. co-ordinate bond

Answer:

Watch Video Solution

21. in germanium crystal.a hole is provided by a___impurity.

A. covalent

B. trivalent

C. monovalent

D. tetravalnt

Answer:

Watch Video Solution

22. on doping germanium metal with a little amount of indium, one gets

A. a rectifier

B. an n-type semiconductor

C. an insulator

D. a p-type emiconductor

Answer:

Watch Video Solution

23. doping materials are caled impurities because

A. they make semiconductrs less pure

B. they alter cystal tructure

C. they chnge chemical properties

D. they change the no. of charge carriers

Answer:

Watch Video Solution

24. a hole in a semiconductcorr is rather diff. from an electron because it has

A. zero mass

B. positively charged vacancy

C. negatively charged particle

D. zero charge

Answer:

Watch Video Solution

25. suitable impurities are added to a semiconductor depending on its use. This is done to

A. increase its life

B. enable it to withstand higher voltages

C. increase its electrical conductivity

D. increases its electrical resistivity

Answer:

Watch Video Solution

26. The donor atoms have energy level

A. slightly below the conduction band

B. slightly above the conduction band

C. slightly below the valence bond

D. slightly above the valence bond

Answer:

 Watch Video Solution

27. The diode is called an electronic valve since

A. it permits the flow of electric current only in one direction from cathode to anode

B. it permits the flow of electric curent only in one direction from anode to cathode in external circuit

C. it permits current in both direction

D. it oermits the flow of electric current in any direction

Answer:

Watch Video Solution

28. in a semiconductor diode, the abrrier potential offers opposition to only

A. majority carriers in both regions

B. minority carriers in both regions

C. free electrons in n region

D. holes in the p region

Answer:

Watch Video Solution

29. in a p -n junction , there is no appreciable current if

A. p-section is made positive and n-section negative

B. a potential diff.is applied acrosee junction making p-section negative nad n-section positive

C. a potential diff. is applied across the junction

D. potential barrrier is craetyed at junction

Answer:

Watch Video Solution

30. The potential barrier developed in a junction diode opposes

A. minority carriers in both regions

B. majority carriers

C. electrons in n refgion

D. holes in p rtegion

Answer:

Watch Video Solution

31. when a p junction dioode is forward biased, the flow of cufrent across the junction is mainly

A. due to drift of charged

B. due to diffusion of charges

C. due to both drift and diffusion of charges

D. due to charge -less particles

Answer:

Watch Video Solution

32. in p-n junction diode, holesdiffuse from p-region to n-region because

A. the free electrons in the n-region affect them

B. they aree swept across the junction by potential diff.

C. there is a greatre concetration of holes in p-region as compared to n -region

D. ther is a greater concetration of electrons in p-region as compared to n-region

Answer:

Watch Video Solution

33. Depletion layer in the P-N junction is caused by

A. drft of holes

B. diffusion of charge carriers

C. migration of imourity ions

D. drift of electrons

Answer:

Watch Video Solution

34. The potential difference developed across the junction due to migration of majority carriers is called___

A. potential barrier

B. electric potential

C. gravitational potential

D. atomic potential

Answer:

Watch Video Solution

35. in asemiconductor diode, reverse bia current is due to drift of ffree electons and holes caused by

A. impurity atoms

B. thermal excitaion

C. crystal structure

D. battery

Answer:

Watch Video Solution

36. a p-n junction diode is sai to be forwarded biased whwn a potential diff. applied across p and n region makes

A. p-region positive and n-region negative

B. p-region negative and n-region positive

C. both p and n-regions positive

D. both p and n-regions negative

Answer:

Watch Video Solution

37. an ideal diode

A. should have zero resistance in the forward bias as well as in erverse bias

B. should have zero resistance in the forward bias and an infinity large resistance in reverse bias

C. sholud have infinitely large ressiatnce in the forward bias and zero resistance in reverse bias

D. shoukd have infinitely large resistance in forward as well as in reverse bias.

Answer:

Watch Video Solution

38. a p-n junction diode cannot be used

A. as a rectifier

B. for converting light energy into elecrtrical energy

C. for getting light radiation

D. for increasing the amplitude of an a.c. signal

Answer:

Watch Video Solution

39. leakage current in ajunction diode

A. decreases with temperature

B. increases with temperature

C. is due to majority carrrier

D. depends on the biasing voltage

Answer:

Watch Video Solution

40. Assertion : Semiconductor devices are thermally stable. Reason: No heating effects occur in semiconductor

A. Assertion is true ,reason is true, reason is correct expalnation for assertion

B. assertion is true,reason is true,reason os not a correct explanaton for assertion

C. assertion is true, resaon is false

D. assertion is false, reason is true

Answer:

Watch Video Solution

41. Electron Holes pairs are generated in photodiode

A. when light enters in its depletion region

B. when light enters in its junction

C. when photon energy hv greater than E_g.

D. (A)and (C)

Answer:

Watch Video Solution

42. Photocurrent in a photodiode depends upon

A. biasing of junction

B. no. of electron holes

C. density of diode material

D. intensity of incident radiation

Answer:

43. Usually Si is used in the designing of photodiodes because

A. it is portable

B. it is easily available

C. it requires less forward biasing

D. current due to thermally generated minority carriers is quite small

Answer:

Watch Video Solution

44. A Solar Cell

A. converts the radiant energy of sun into electrical power

B. coverts the radiant energy of sun into heat

C. reflects all lights from sun

D. absorbs energy and converts into sound energy

Answer:

Watch Video Solution

45. Combination of solar cells designed to increase the electric power output is called

A. Solar array

B. solar panels

C. solar module

D. all of these

Answer:

Watch Video Solution

46. solar cell producs photo voltage whwn incident light has eenrgy

A. equal to band gap energy

B. greater than band gap energy

C. less than band gap renergy

D. greater or equal to band gap energy

Answer:

Watch Video Solution

47. The color of light emitted by LED depends on

A. its reverse bias

B. its forward bias

C. type of semiconductor material

D. rectifier

Answer:

Watch Video Solution

48. The barrier potential in LED depends on type of

A. impurity

B. junction

C. biasing

D. semiconducors

Answer:

Watch Video Solution

49. the brightness of LED can be controlled by

A. applied potential differences

B. by changing the value of series esistance

C. by changing the value of parallel resistance

D. none of these

Answer:

Watch Video Solution

50. choose the INCORRECTT statement

A. LEDs are cheap

B. LEDS require high operating voltage

C. LEDs have light weeight

D. LEDs have high operating speed

Answer:

Watch Video Solution

51. thermistor is a temperature sensitive___device

A. insultor

B. conducor

C. semiconductor

D. super conductor

Answer:

 Watch Video Solution

52. in case of a semiconductor, which of the foll. Statements is wrong?

A. doping increases conductivity

B. temperature coefficent of resistance is negative

C. resistivity is in between that of a conductor and insulator

D. at absolute zero temperature, semiconductor behaves like a conductor

Answer:

Watch Video Solution

53. electrical conductivity of a silicon is ___

A. $6.3 \times 10^{7} Sm^{-1}$

B. $10^{-15} Sm^{-1}$

C. $1.67 \times 10^{-2} Sm^{-1}$

D. $8 \times 10^{-11} Sm^{-1}$

Answer:

Watch Video Solution

54. the conductivity $(\sigma)$of a solid is given by [n=no. of carriers per unit volume, q= charge on th carrirs, μ=mobility of carriers]

A. $\sigma = \frac{nq}{\mu}$

B. $\sigma = (nq(\mu))$

C. $\sigma = \frac{n(\mu)}{q}$

D. $\sigma = \frac{\mu}{nq}$

Answer:

Watch Video Solution

55. electrical conductivity of a semiconductor

A. decreases with the rise in its temprearture

B. increases with the rise in its epmerature

C. does not change with the rise in its temperature

D. first increases and then decreses with the rise in its temperature

Answer:

Watch Video Solution

56. at room temperature,electrical conductivity of semiconductor is

A. greater than that of a good conductor

B. zero

C. less than that of a good conductor

D. less than that of a bad conductor

Answer:

Watch Video Solution

57. Assertion:the resistivity of a semiconductor increases with temperature. Reason: in a conducting solid,the rate of collisions between free electrons and ions increases with increase of temperature

A. assrtion is true,reason is true,reason is correct expalanation for assertion

B. assertion is true, reason is true,reason is not cirrect explanation for assertion

C. assertion is false bbut ,reason is true

D.

Answer:

Watch Video Solution

58. in a good conductor the energy gap between the conduction band and the valence band is

A. infinite

B. wide

C. narrow

D. zero

Answer:

Watch Video Solution

59. energy band in solids are a consequence of

A. Ohm's law

B. pauli's exclusion principle

C. bohr's theory

D. heisenberg's unceratinity principle

Answer:

60. three semiconductors are arranged in the incresing order of their gap as follows. The correct arrangement is

A. tellurium,germanium,silicon

B. tellurium,silicon,germanium

C. silicon,germanium,tellurium

D. silicon,tellurium,germanium

Answer:

Watch Video Solution

61. Assertion: the energy gap between the valence band and conduction band is greater in silicon than in germanium. Reason: thermal

energy produces fever minority carriers in silicon than in ghermanium

A. asserton is true,reason is true,reason is correct expalnatiomn for assertion

B. asserton is true,reason is true,reason is not a correct expalnatiion for assertion

C. assertion is true, resaon is false

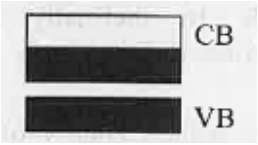
D. assertion is false, reason is true

Answer:

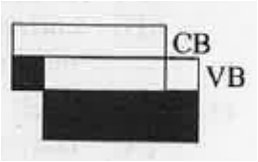
Watch Video Solution

62. which one of the energy band diagrams shown in the figure coresponds to that of semiconductor?

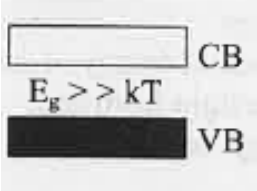
A.



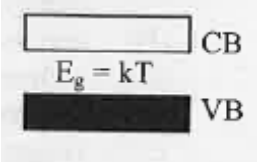
B.



C.



D.



Answer:

Watch Video Solution

63. electronic configuration of silicon is___.

A. $Is^2, 2s^2, 2p^6, 3s^1$

B. $Is^2, 2s^2, 2p^6, 3s^2, 3p^2$

C. $Is^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^{10}, 4s^2, 4p^2$

D. $Is^2, 2s^2, 2p^6, 3s^2, 3p^3$

Answer:

Watch Video Solution

64. in a semiconductor,

A. there are no free electrons at any temperature

B. the no. of free electrons is more than theat in aconductor

C. there are no free electrons at 0 k

D. none of these

Answer:

Watch Video Solution

65. In an intrinsic semiconductor

A. only electrons are responsible for flow of current

B. both holes and electron carry current

C. both holes and electrons carry curent with electrons being majorityt carriers

D. only holes are responsibe for flow of current

Answer:

Watch Video Solution

66. let n_p and n_e be the no. oh holes and conduction electrons in a semicondutcor . Then,

A. $n_p > n_e$ in an intrinsic semiconductor

B. $n_p = n_e$ in an extrinsic semiconductor

C. $n_p = n_e$ in an intrinsic semiconductor

D. $n_p > n_e$ in an intrinsic semiconductor

Answer:

Watch Video Solution

67. resistivity of pure geramanium crystal at room temperature in order of

A. 10^4

B. 10^3

C. 10^2

D. 10^1

Answer:

Watch Video Solution

68. in a pure silicon ($n_i = \frac{10^{16}}{m^3}$) $crystal at 300k$, 10^21` atoms of phosphorous are added percubic meter. The new hole concetaration wil be.

A. $10^{21} perm^3$

B. $10^{19} perm^3$

C. $10^{11} perm^3$

D. $10^5 perm^3$

Answer:

Watch Video Solution

69. to a germanium sample , trace sof gallium are added as an imourity. The resuyltant sample would behave like

A. a conductor

B. a p-type semiconductor

C. an N-type semiconductor

D. an insulator

Answer:

Watch Video Solution

70. when phosphorous and antimony are mixed in germanium , then

A. p-type semicionductor is formed

B. n-type semiconductor is formed

C. both (A) and (B)

D. none of these

Answer:

Watch Video Solution

71. Intrinsic semiconductor is electrically neutral. Extrinsic semiconductor having large no. of current carriers would be

A. positively charged

B. neghatively charged

C. positively charged or negatively charged depending upon the type of impurity

that has been added

D. electrically neutral

Answer:

Watch Video Solution

72. Germanium and Silicon belong to the 14th group of periodic table. Hence each atom of Ge or Si will have

A. two valence electrons

B. four valence electrons

C. three valence electrons

D. one valence electrons

Answer:

Watch Video Solution

73. After Doping , resistivity of a semiconductor

A. does not alter

B. increases

C. decreases

D. may increase or decrease depending on the dopant

Answer:

Watch Video Solution

74. the electrical conductivity of a p-type semiconductor is determined by the no. of

A. holes

B. valence electrons

C. electrons in n refgion

D. conduction electrons

Answer:

Watch Video Solution

75. In Extrinsic Semiconductors

A. the conduction band and valence band overlap

B. the gap between conduction band and valence band is more than 16eV

C. the gap between conduction band and valence band is near about 1eV.

D. the gap between conduction band and valence band will be 100eV andd more

Answer:

Watch Video Solution

76. The majority charge carriers in P-type semiconductors are

A. electrons

B. protons

C. holes

D. neutrons

Answer:

Watch Video Solution

77. a p-type semiconductor can be obtained by adding

A. arsenic to pure silicon

B. gallium to pure silicon

C. antimony to pure germanium

D. phosphorous to pure germanium

Answer:

 Watch Video Solution

78. if n_e aand n_h are the no. of electrrons and holes in a semiconductor heavily doped with phosphorous , then

A. $n_e > > n_h$

B. $n_e < < n_h$

C. $n_e \leq n_b$

D. $n_e = n_h$

Answer:

Watch Video Solution

79. when n-type of semiconductor is heated

A. no. of electrons increases while that of holes decreases

B. no. of holes increases with that of electrons decreases

C. no. of electrons and holes remains same

D. no. of electrons and holes incraeses equally

Answer:

Watch Video Solution

80. A diode converts A.C. voltage into a /an

A. A.C voltage with diff.peak value

B. D.C. voltage with constant value

C. biderctional pulsating voltage with a constant r.m.s value

D. unidirectional pulasating voltage that keeps on dropping in between zero to maximum

Answer:

Watch Video Solution

81. the order of thickness of delpting region in p-n junction is

A. $10^{-12}m$

B. $10^{-6}m$

C. 1mm

D. 1cm

Answer:

Watch Video Solution

82. p-n junction diode works as an insulator , if connected

A. to A.C

B. in forward bias

C. in reverse bias

D. to D.C

Answer:

Watch Video Solution

83. in a semiconductor diode, a p-side is earthed and n-side is applied a potential of -2V , the diode will

A. conduct

B. not conduct

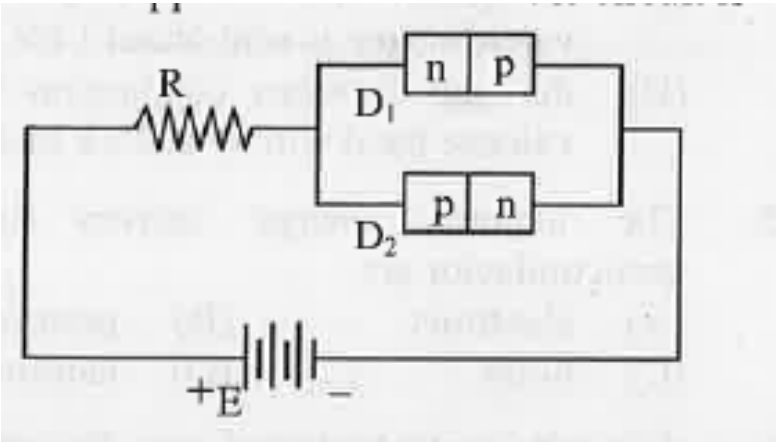
C. conduct partially

D. breakdown

Answer:

Watch Video Solution

84. figure shows ttwo p-n junction diodes alond with aresistance R and a dc battery E. the path of flow of appreciable current in the circuit is,



A. from negative pole through diode D_1 to the positive pole of the battery

B. from diode D_1 only

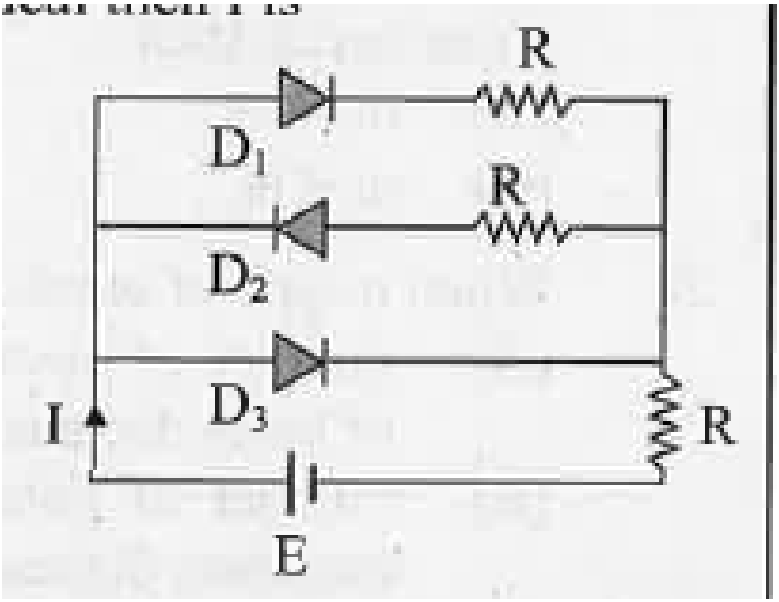
C. from positiuve pole of the battery through diode D_2 to negative pole of battrey

D. will not flow from diode D_2

Answer:

Watch Video Solution

85. in the foll. Circuit of PN junction , diodes D_1, D_2 and D_3 are ideal then I is



A. E/R

B. E/(2R)

C. (2E)/(3R)

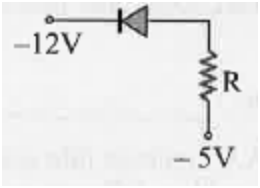
D. ZERO

Answer:

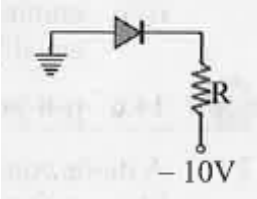
Watch Video Solution

86. OF THE DIODES SHOWN IN the foll. Diagrams, which one is reverse biased?

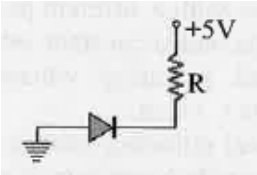
A.



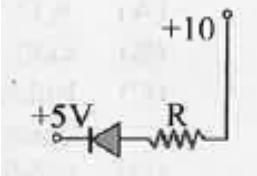
B.



C.



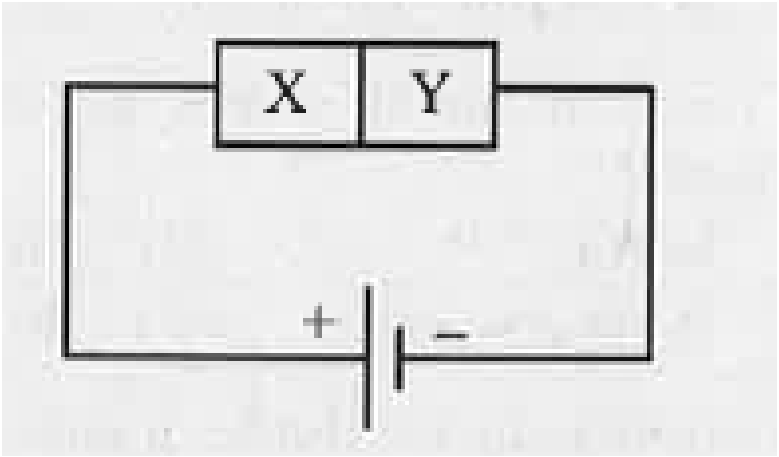
D.



Answer:

Watch Video Solution

87. a semiconductorX is made by doping a germanium crytsal with arsenic (z=33). A second semiconductor Y is made by doping germanium with indium (z=49) . The two are joined end to end and connected to a battery as shown in fiure. Which of the foll. statement is correct?



A. X is p-type , Y is n-type and the juncition is forward biased

B. X is n-type , Y is p-type and the juncition is forward biased

C. X is p-type , Y is n-type and the juncition is reverse biased

D. X is n-type , Y is p-type and the juncition is reverse biased

Answer:

88. the dominant mecahnisms for motion of chargecarriers in forward and reverse biased silicon p-n junctions are

A. drift in forward bias, diffusion in reverse bias

B. diffusion in forward bias, drift in re verse bias

C. diffusion I both forward and reverse bais

D. drift in both forward and reverse bias

Answer:

Watch Video Solution

89. serious draback of the semiconductors devices is __

A. they cannot be used with high voltage

B. thy pollute the environment

C. they are costly

D. they do not last for long time

Answer:

Watch Video Solution

90. in LED, to avoid damage to the diode ___is used

A. capacitor

B. resistor

C. insulators

D. conductor

Answer:

Watch Video Solution

91. in LED, intensity of emitted light

A. increase with forward current

B. decrease with forward current

C. increase with reversecurrent

D. decrease with reverse current

Answer:

Watch Video Solution

92. which of the foll. Is NOT an appliction of photodiode?

A. detection of an optical signal

B. object counters

C. optocouples

D. data profiling

Answer:

Watch Video Solution

93. in a p-n junction photo cell, the value of photo-electromotive force produced by monochromatic light is proportional to

A. the voltage applies at the p-n junction

B. the b arrier voltage at the p-n junction

C. the intyensity of the light falling on the cell

D. the frequency of the light falling on thecell

Answer:

Watch Video Solution

94. Assertion :light emitting diode (LED) emits spontaneous radiation reason: LED are forward biased p-n junction

A. assertion is true,reason is true,reason is a correct explanation for asseertion

B. assertion is true,reason is true,reason is NOT a correct explanation for asseertion

C. assertion is true, resaon is false

D. assertion is false, reason is true

Answer:

 Watch Video Solution

95. thermistors may have

A. positive temperature coefficient

B. negative temperatuire coefficient

C. both positive and negative temperatuer coefficiuent

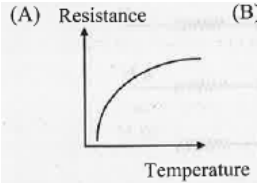
D. zero temperature coeffiient

Answer:

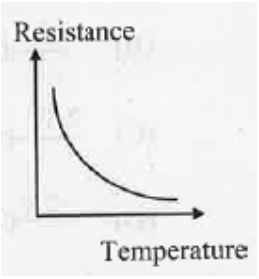
Watch Video Solution

96. which of the foll. Graphs represents NTC thermistors

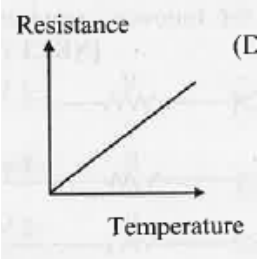
A.



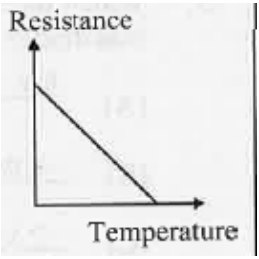
B.



C.



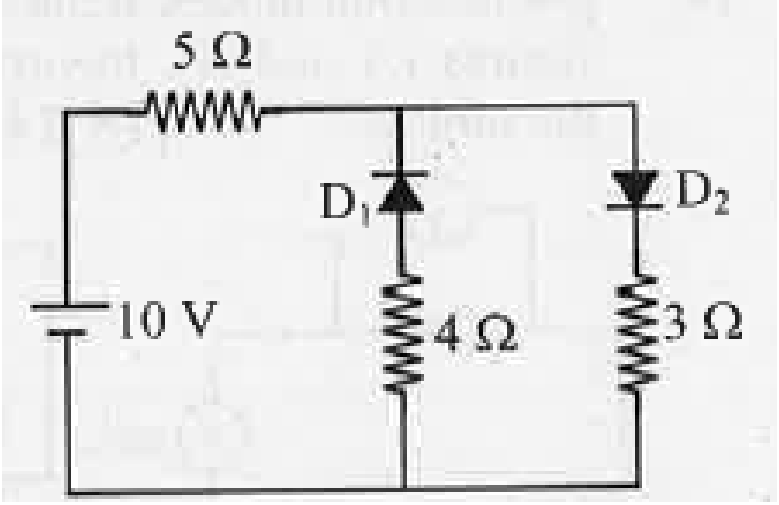
D.



Answer:

Watch Video Solution

97. the circuit has two oppositely connected ideal diodes in parallel. What is the curenet ideal dioddes in parallel. What is the current foll. In the circuit?



A. 1.25A

B. 1.68 A

C. 2.00 A

D. 2.25A

Answer:

Watch Video Solution

98. a p-n junction diode when forward biased has a drop of 0.4 V which is assumed to be independent of currebnt A. a current excess of 10mA through the diode damages (burns) the diode .if we want to use a 2 V battrey to

forwqard bias the diode, what should be the avlue of resistor used in series with the diode so thatthe maximum current does NOT exced 5mA?

A. 160ω

B. 260ω

C. 390ω

D. 520ω

Answer:

Watch Video Solution

99. for a photodiode , the forbidden energy gap$(E_8)$of the material used is 2.8eV and wavelength of radiations (λ) incident on it is 5780 A. then the emission of electrons is possible when incident radiation have

A. λ=5780A

B. λ lt5780A

C. λgt5780 A

D. none of these

Answer:

Watch Video Solution

100. if the band gap between valence band and conduction band in a matereial is 5.0 eV , then the material is

A. semkicondu tor

B. good conductor

C. supreconductor

D. insulator

Answer:

 Watch Video Solution

101. in insulatore (C.B. is conduction band and V.B. is a valence band)

A. vV.B.is partially filled with electrons

B. C.B. is partially filed with electrons

C. C.B.is empty and V.B is filled with electrons

D. C.B is filled with electrons amd V.B is empty

Answer:

Watch Video Solution

102. the energy gap in case of which of the foll. Is less than 3eV?

A. germnanium

B. iron

C. copper

D. aluminiu

Answer:

Watch Video Solution

103. the band gap of an insulator , conductor and semic conductor are E_{gI} and E_{g2} and E_{g3} . The relationshiop between them is given as___

A. E_{gI} gt E_{g2} lt E_{g3}

B. E_{gI} gt E_{g2} gt E_{g3}

C. E_{gI} lt E_{g2} gtE_{g3}

D. E_{gI} lt E_{g2} ltE_{g3}

Answer:

Watch Video Solution

104. C and Si bot have same lattice structure , having bomnding electrons in each. Howeever,

C is insulator whweras Si is intrinsic semiconductor. This is because

A. in case of C the valence band is not completetly filled at absolute zero temperature

B. in case of C the conduction ban is partly filled even at absolute zero temperature

C. the four bonding electrons in the case of c lie uin the second orbit whereas in the case of Si, they lei on the third

D. the four bonding electrons in the case of c lie uin the third orbit whereas in the case of Si, they lei on the fourth orbit

Answer:

Watch Video Solution

105. the density of an electron-hole pair in a pure germanium is $3 \times 10^{16} m^{-3}$ at room temperature. On doping with aluminium , the hole density increses to $4.5 \times 10^{22} m^{-3}$.now

the electron density (in m^{-3})in doped germanium will be

A. 1×10^{10}

B. 2×10^{10}

C. 0.5×10^{10}

D. 4×10^{10}

Answer:

Watch Video Solution

106. a semiconductor has equal electron and hole concetration of$2x10^{8}m^{-3}$. On doping with a certain impurity, the electron concentration increases to $4x10^{10}m^{-3}$, then the new hole concentration of the semiconductor is

A. $10^{6}m^{-3}$

B. $10^{8}m^{-3}$

C. $10^{10}m^{-3}$

D. $10^{12}m^{-3}$

Answer:

Watch Video Solution

107. in an n - type semiconductor, which of the foll.statement is true ?

A. electrons are majority carriers and trivalent atoms are dopants

B. electrons are minority carriers and pentavalent atoms are dopants

C. holes are majority carriers and pentavalent atoms are dopants

D. holes are majority carriers and trivalent atoms are dopants

Answer:

Watch Video Solution

108. in n type semiconductor , electrons are majority charge carriers but it does not show any negative charge. The resaon is

A. elaectrons are stationary

B. elaectrins are neutralizw with holes

C. mobility of electrons is exteremely small

D. atom is electrically neutral

Answer:

Watch Video Solution

109. the barrier potential of p-n junction depends on : a.type of semiconductor

matereial b.amount of doping c. temperature

which one of the foll. Is correct?

A. a and b only

B. b only

C. b and c only

D. a,b and c

Answer:

Watch Video Solution

110. with forwardf biased mode, the p-n junction diode.

A. is one in which width of depletion layer increses

B. is one in which potential barier increases

C. acts as closed switch

D. acts as open switch

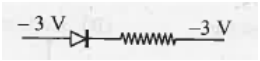
Answer:

Watch Video Solution

111. the forward biased diode connection is

A.

B.



C.

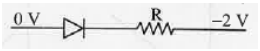
D.

Answer:

Watch Video Solution

112. whicch one of the foll. Represents reverse bias diode?

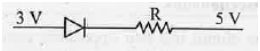
A.



B.

C.

D.



Answer:

Watch Video Solution

113. p-n junction diods are arranged as shown in the figures (A and B). Identify type bias applied to the diodes

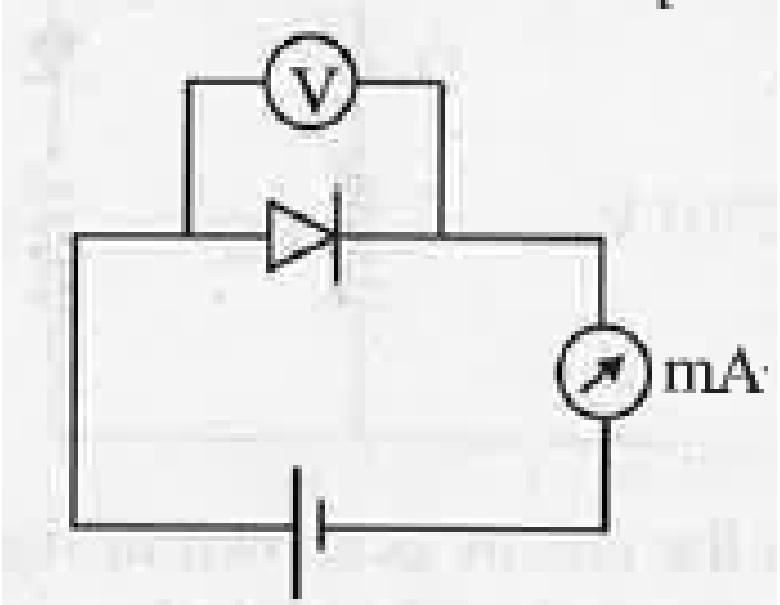


Fig. (A)

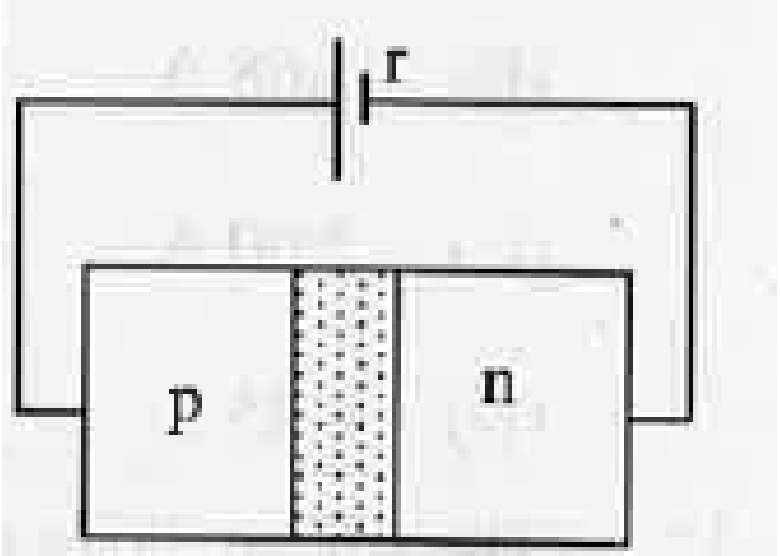


Fig. (B)

A. A shiows reverse bias , B shows forward bias

B. both A and B show forward bias

C. both A and B show reverse bias

D. A shows forward bias , B shows reverse bias

Answer:

Watch Video Solution

114. pick out the statement which is not CORRECT

A. at a low temperature, the resistance of a semiconductor ius very high

B. movement of holes is restricted to the a valence band only

C. width of the depletion region increases as the forwaard bias voltage increases in case of a p-n junction

D. in aforward bias condition, the diode heavily conducts

Answer:

Watch Video Solution

115. aplication of a forward bias to a p-n junction

A. increases the no. of donors on the n-side

B. increases the electric field in the depletion zone

C. increases the potential diff. across the depletion zone

D. widens the depletion zone

Answer:

Watch Video Solution

116. the change in curtrent through a junction diode is 1.2mA when the forward bias voltage is changed by 0.6V the dynamic resistance is

A. $500 ohm$

B. $300 ohm$

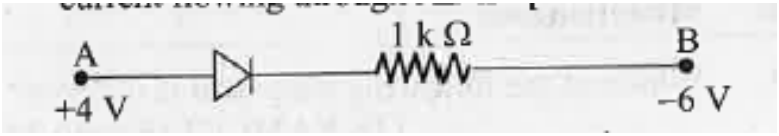
C. $150 ohm$

D. $250 ohm$

Answer:

Watch Video Solution

117. consider the junction diode as ideal. The value of current flowin g through AB is



A. 10^{-1}A

B. 10^{-3}A

C. 0A

D. 10^{-2}A

Answer:

Watch Video Solution

118. In the figure shown, if the diode forward voltage drop is 0.2V, the voltage diff. between A and B is

A. 2.2 V

B. 1.3 V

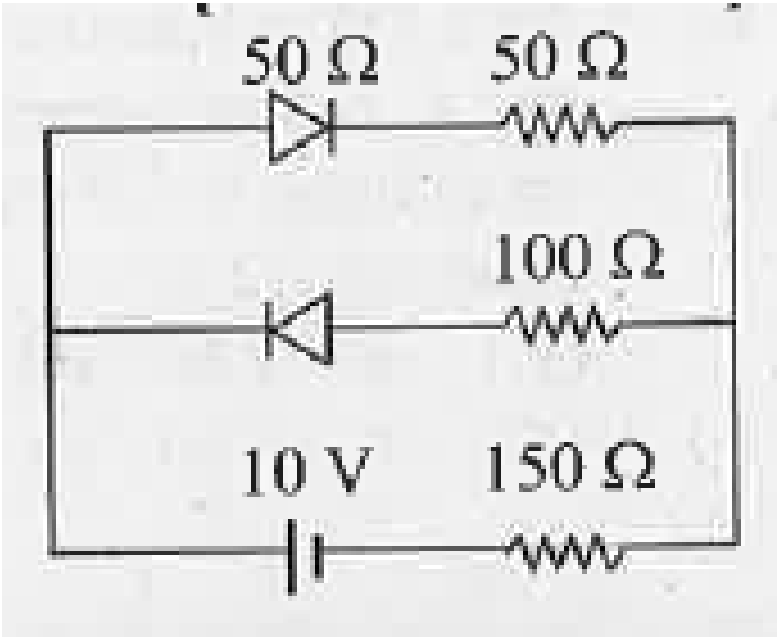
C. 0

D. 0.5 V

Answer:

Watch Video Solution

119. assume that even each diode shown in the figure has a forward basis resistnace of 50 ohm and an infinite reverse bias resistance . The current through the resistance 150 ohm is



A. 0.66 A

B. 0.05 A

C. zero

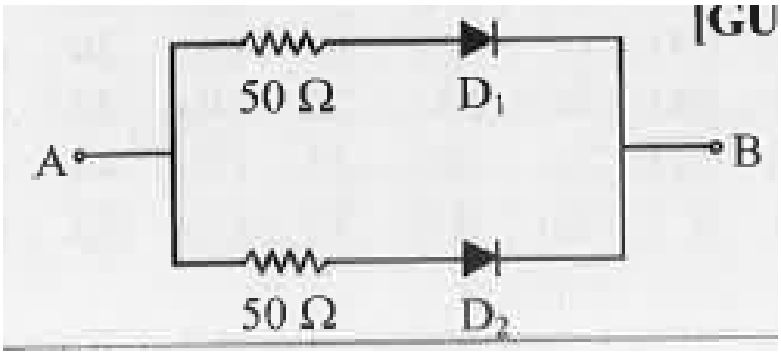
D. 0.04 A

Answer:

Watch Video Solution

120. for the current shiown in the figure . The equivalent resistance between A and B for two cases (i) $V_A > V_B$ (ii) $V_B > V_A$ is ___ohm and

____ohm (D_1 and D_2 are ideal diodes)



A. 25, ∞

B. 50, ∞

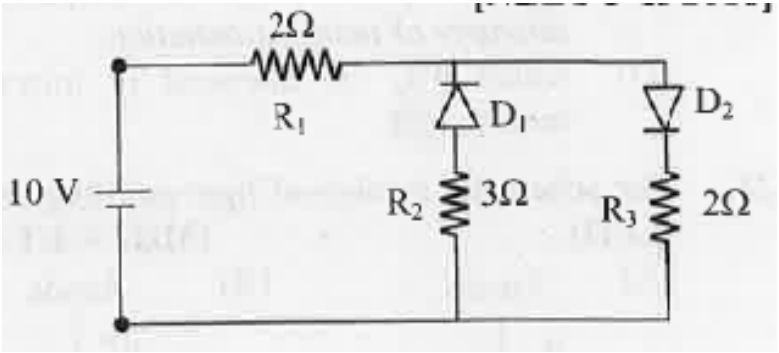
C. ∞,25

D. 25,25

Answer:

Watch Video Solution

121. the given circuit has two ideal diodes connected as shown in the figure below. The current flowing through the resistance R_1 will be



A. 3.13A

B. 2.5A

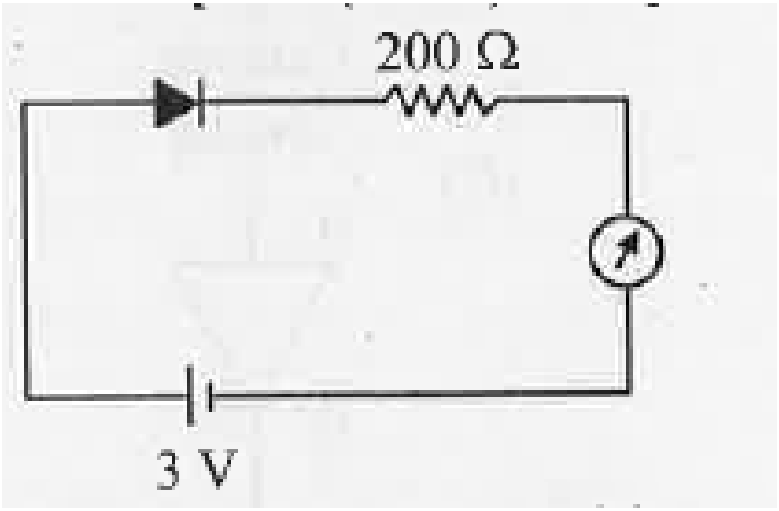
C. 10.0A

D. 1.43A

Answer:

Watch Video Solution

122. the reading of the ammeter for a silicon diode in the given circuit is :



A. 11.5mA

B. 13.5mA

C. 0

D. 15mA

Answer:

Watch Video Solution

123. when a semiconductor device is connected in series with a battery and a resistance, a current is found to flow in the

circuit . If , hiwever the polarity of the battery is reversed, practically no current flows in the circuit. The device may be

A. a p-type semicondutor

B. a n- type semiconducto

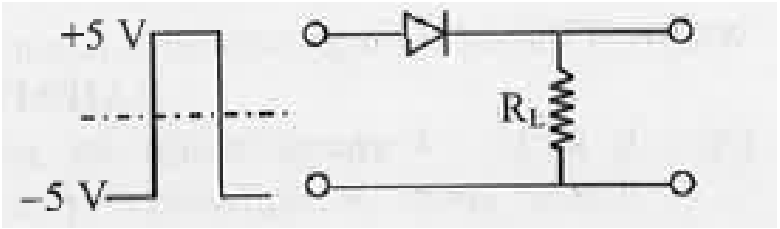
C. an intrinsic semiconductor

D. a p-n juntion

Answer:

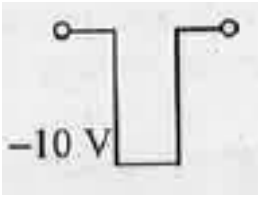
Watch Video Solution

124. if in a p-n junction , a square input signal of 10 V is applied as shown

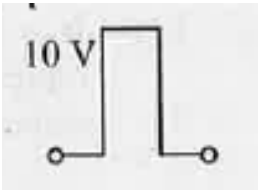


then output acrioss R_1 will be :

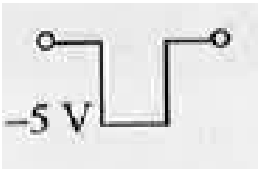
A.



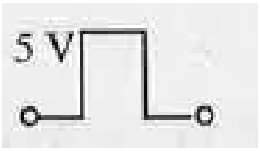
B.



C.



D.



Answer:

Watch Video Solution

125. in a p-n junction diode, change in temperature due to heating

A. affects only reverse resistance

B. affects only forward resistance

C. does not afect resistance of p-n junction

D. affects the overall V-I characteristics of p-n junction

Answer:

Watch Video Solution

126. Photodiode is a device

A. which is always opertaed in reverse bias

B. which is always operated in forwarded bias

C. in which photo current is independent of intensity of incident radiation

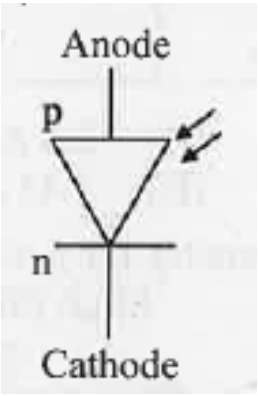
D. which may be operated in forwarded or reverse bias

Answer:

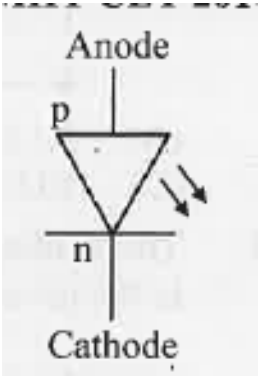
Watch Video Solution

127. The schematic symbol of Light Emitting Diode (LED) is

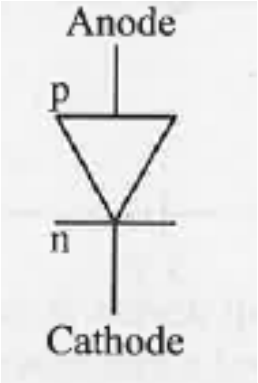
A.



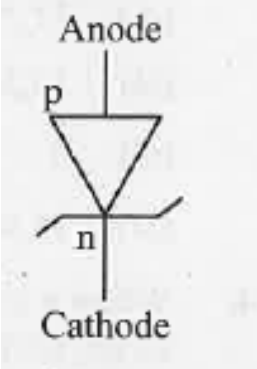
B.



C.



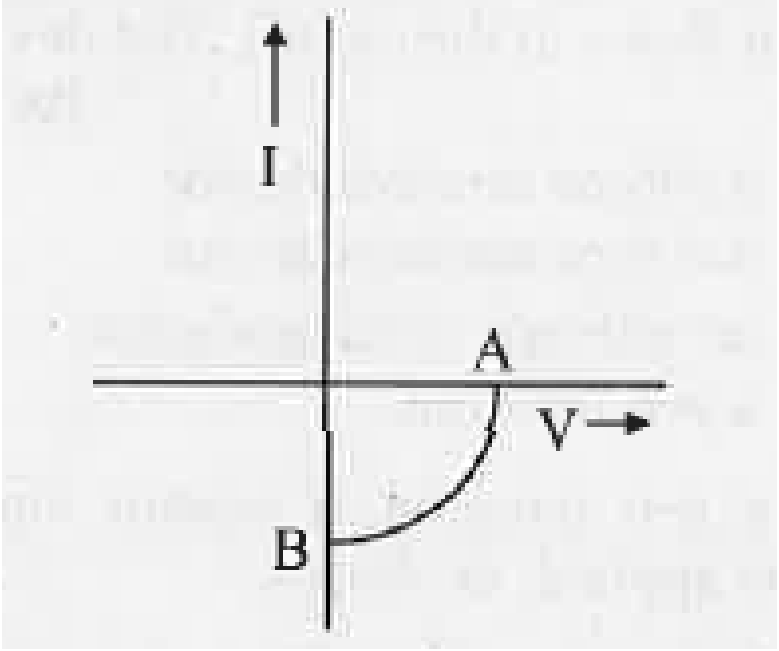
D.



Answer:

Watch Video Solution

128. The given graph represents V-I characteristics for a semiconductor device



A. it is V-I characteristics for solar cell where point A represents open circuit voltage and point B short circuit current

B. it is for a solar cell and point A and B represent open circuit voltage and

current

C. it is for a photodiode and points Aand B represent open circuit voltage and current

D. it is for a LED and points A and B represents open circuit voltage and short circuit current.

Answer:

Watch Video Solution

129. A wire of aluminum and a wire of germanium are cooled to a temperature of 770K . Then

A. resistance of each of them decreases.

B. resistance of each of them increases.

C. resistance of alumminium wire increases and that of germanium wire decreases

D. resistance of alumminium wire decreases and that of germanium wire increases

Answer:

Watch Video Solution

130. which of the foll. Statement is not true?

A. the resistance of an intrinsic semiconductor decreases with increase in temperature

B. doping pure Si with trivalent impuroties gives p-type semiconductor

C. the majority carriers in n-type semiconductors are holes

D. a p-n junction can zct as semiconductor diode

Answer:

Watch Video Solution

131. In Gallium Arsenide material, Ohm's law does not hold good because

A. current remains constant for any value of voltage

B. resistance is infinite

C. negative resistance exists in the voltage current variation

D. current goes to infinite at very low voltages

Answer:

 Watch Video Solution

132. An LED is constructed from a p-n junction based on a certain semi conducting material whose energy gap is 1.9eV then the wavelength of the emitted light is

A. $6.5 \times 10^{-7} m$

B. $2.9 \times 10^{-9} m$

C. $9.1 \times 10^{-5} m$

D. $1.6 \times 10^{-8} m$

Answer:

Watch Video Solution

133. Generally, the no. of electrons in the valence shell of good conductor is

A. 6 or more than 6

B. 5

C. 4

D. 3 or less than 3

Answer:

 Watch Video Solution

134. the process of addding impurities to the pure semiconductor is called

A. bonding

B. binding

C. doping

D. inbsulating

Answer:

 Watch Video Solution

135. the intrinsic semiconductors becomes an insulator at

A. $0^\circ C$

B. $-100^\circ C$

C. 300K

D. 0 K

Answer:

Watch Video Solution

136. a p -type semiconductor is (i) a silicon crystal doped with arsenic impurity (ii)a silicon crystal doped with aluminium impurity (iii) a germanium crystal doped with boron impurity (iv) a germanium crystal doped with phosphorous impurity

A. I and ii are correct

B. ii and iii are correct

C. I and iv aare correct

D. only i is correct

Answer:

Watch Video Solution

137. when forward bias is appllied to as p-n junction . Then wat happens to the potential barrier V_B and the width of charged depleted region X?

A. $V_B$increases , X decreases

B. $V_B$decreases , X increases

C. $V_B$increases , X increases

D. $V_B$decreases , X decreases

Answer:

Watch Video Solution

138. a Ge specimen is doped with Al the concentartion of acceptor atoms is ~10^{21} atoms/$m^{3,}$ given that the intrinsic concentartion of electron -hole pairs is ~`10^(19)/m^3, the concentration of electron in the specimen is

A. $\frac{10^{17}}{m^3}$

B. $\frac{10^{15}}{m^3}$

C. $\frac{10^{4}}{m^3}$

D. $\frac{10^{2}}{m^3}$

Answer:

Watch Video Solution

139. if the two ends p and n of p-n junction diode are joined by a wire,

A. they will not be asteady current in the circuit

B. they will be asteady current from n-side to p-side

C. they will be a steady p-side to n-sidee

D. they will not be a current depending upon the resistnce of the connecting wire

Answer:

Watch Video Solution

140. a light emitted diode is

A. always used in forward biased condition

B. always used in reverse biased condition

C. never used in forward biased condition

D. used in both forward and revers biased position depending upon its application

Answer:

Watch Video Solution

141. in remote controlled receivers , the sensors are

A. LEDs

B. solar cells

C. photodiodes

D. xzener diodes

Answer:

Watch Video Solution

142. the temoperature -coefficient of resistivity of semiconductors is

A. $+ve$

B. $-ve$

C. zero unpreditable

D.

Answer:

Watch Video Solution

143. carbon , silicon and germanium have four valence electrions each . The most appropriate statement for these elements

A. no. of free electrons for conduction is ssignificant in all three

B. no. of free electrons for condution is signifucant inly in Si and Ge but small in C

C. no. of free condutcion electrons is significant in C but small in Si and Ge

D. no. of free electrons is negligibly small in all three

Answer:

Watch Video Solution

144. the no. densities of electrons and holes in a pure germanium at room temperature are equal and its value is 2×10^{16} per m^3 . On doping with aluminium the hole density

increases to 3.5×10^{22} per m^3 then the electron density in dppoed germanium is

A. $1.1 \times 10^{10} m^{-3}$

B. $2.2 \times 10^{9} m^{-3}$

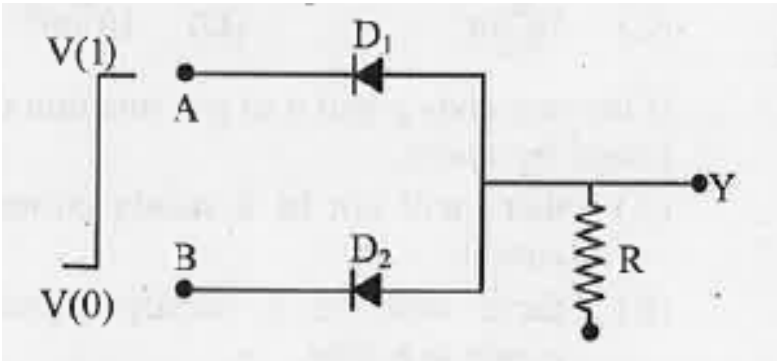
C. $3.3 \times 10^{9} m^{-3}$

D. $4.4 \times 10^{9} m^{-3}$

Answer:

Watch Video Solution

145. the circuit below represents a



A. OR gate

B. AND gate

C. NOR gate

D. NAND gate

Answer:

Watch Video Solution

146. The maximum wavelength which a photodiode can detect with E_g =0.74eV is

A. 1680nm

B. 1764nm

C. 1847nm

D. 1932nm

Answer:

Watch Video Solution

147. When p-n junction is reverse biased, then the width of barriers potential will

A. increase and it will offer more resitance

B. decrease and it will offer more resitance

C. remain constant and it will not offer more resitance

D. decrease and it will offer lessresitance

Answer:

Watch Video Solution