PRACTICE EXERCISES

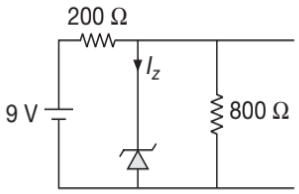
SINGLE CORRECT CHOICE TYPE QUESTIONS

This section contains Single Correct Choice Type Questions. Each question has four choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

1. The part of a transistor which is most heavily doped to produce large number of majority carriers is
(A) emitter
(B) base
(C) collector
(D) can be any of the above three

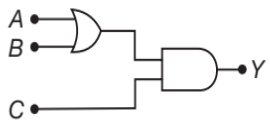
2. In an *npn* transistor circuit, the collector current is 10 mA. If 90% of the electrons emitted reach the collector
(A) the emitter current will be 9 mA
(B) the emitter current will be 11 mA
(C) the base current will be 10 mA
(D) the base current will be 0.1 mA

3. The reverse breakdown voltage of a Zener diode is 5.6 V in the given circuit.



The current I_Z through the Zener is
(A) 15 mA (B) 7 mA
(C) 10 mA (D) 17 mA

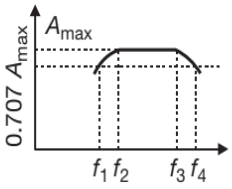
4. To get an output $Y = 1$ from circuit of figure, the inputs must be



	A	B	C
(A)	0	1	0
(B)	1	0	0
(C)	1	0	1
(D)	1	1	0

5. Formation of covalent bonds in compounds exhibits
(A) wave nature of electron
(B) particle nature of electron
(C) both wave and particle nature of electron
(D) None of these

6. The frequency response curve of *RC* coupled amplifier is shown in figure. The band width of the amplifier will be

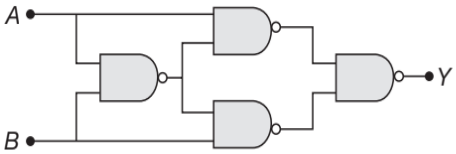


(A) $f_3 - f_2$ (B) $f_4 - f_1$
(C) $\frac{f_4 - f_2}{2}$ (D) $f_3 - f_1$

7. A strip of copper and another germanium are cooled from room temperature to 80 K. The resistance of
(A) each of these decreases
(B) copper strip increases and that of germanium decreases
(C) copper strip decreases and that of germanium increases
(D) each of these increases

8. The current voltage relation of diode is given by $I = \left(e^{1000V/T} - 1\right)$ mA, where the applied voltage V is in volts and the temperature T is in degree kelvin. If a student makes an error measuring ±0.01 V while measuring the current of 5 mA at 300 K, what will be the error in the value of current in mA?
(A) 0.2 mA (B) 0.02 mA
(C) 0.5 mA (D) 0.05 mA

9. Truth table for system of four NAND gates as shown in figure is



(A)

A	B	Y
0	0	0
0	1	0
1	0	1
1	1	1

(B)

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	0

(C)

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

(D)

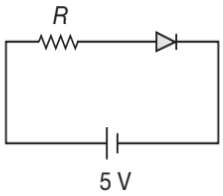
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

10. A semiconductor device is connected in series circuit with a battery and a resistance. A current is found to pass through the circuit. If the polarity of the battery is reversed, the current drops almost to zero. The device may be
(A) a p-type semiconductor
(B) a n-type semiconductor
(C) a pn junction
(D) an intrinsic semiconductor

11. An oscillator is basically an amplifier with gain
(A) less than unity (B) more than unity
(C) zero (D) 0.5

12. The difference in the variation of resistance with temperature in a metal and a semiconductor arises essentially due to the difference in the
(A) crystal structure
(B) variation of the number of charge carriers with temperature
(C) type of bonding
(D) variation of scattering mechanism with temperature.

13. The diode used in figure requires minimum current of 1 mA to be above the knee voltage 0.7 V of current versus voltage characteristics. The maximum value of R so that the voltage is above knee point is



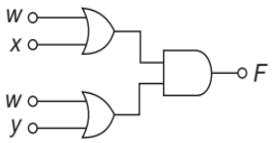
(A) 5 kΩ (B) 5.7 kΩ
(C) 4.3 kΩ (D) 3.5 kΩ

14. A piece of copper and another of germanium are cooled from room temperature to 80 K. The resistance of
(A) each of them increases.
(B) each of them decreases.
(C) copper increases and germanium decreases.
(D) copper decreases and germanium increases.

15. In a full wave rectifier with input frequency 50 Hz, the ripple in the output is mainly of the frequency (in Hz)
(A) 25 (B) 50
(C) 100 (D) 50^2

16. In the middle of the depletion layer of a reverse-biased p-n junction, the
(A) electric field is zero
(B) potential is maximum
(C) electric field is maximum
(D) potential is zero

17. The diagram of a logic circuit is given below. The output F of the circuit is represented by



(A) $W\cdot(X+Y)$ (B) $W\cdot(X\cdot Y)$
(C) $W+(X\cdot Y)$ (D) $W+(X+Y)$

18. For a transistor the value of $\alpha = 0.9$, the value of β is
(A) 1 (B) 0.09
(C) 0.9 (D) 9

19. $\frac{1}{\alpha}-\frac{1}{\beta}$ is equal to
(A) 1 (B) 2
(C) $\alpha\beta$ (D) $\alpha-\beta$

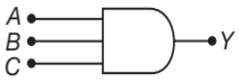
20. The conductivity of semiconductors like Ge and Si
(A) increases when it is doped with tetravalent impurity
(B) increases when it is doped with pentavalent or trivalent impurity
(C) increases when it is doped with pentavalent impurity and decreases when it is doped with trivalent impurity
(D) decreases when it is doped with pentavalent impurity and increases when it is doped with trivalent impurity

21. When npn transistor is used as an amplifier
(A) electrons move from base to collector
(B) holes move from emitter to base
(C) electrons move from collector to base
(D) holes move from base to emitter

22. In a semiconductor diode P side is earthed and N, side is applied a potential of -2 V. The diode shall
(A) conduct
(B) not conduct
(C) conduct partially
(D) breakdown

23. Given sets of elements are phosphorus, arsenic, indium and bismuth. The addition of which in pure semiconductor will result in p-type semiconductor
(A) phosphorus, arsenic and indium
(B) phosphorus, arsenic, indium and bismuth
(C) indium and arsenic
(D) indium only

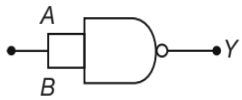
24. The output from a logic gate is 1 when inputs A, B and C are such that



(A) $A=1, B=0, C=1$ (B) $A=1, B=1, C=0$
(C) $A=B=C=0$ (D) $A=B=C=1$

25. For a transistor amplifier in common emitter configuration for load impedance of 1 kΩ ($h_{fe}=50$ and $h_{oe}=25$) the current gain is
(A) –5.2 (B) –15.7
(C) –24.8 (D) –48.78

26. The symbol represents



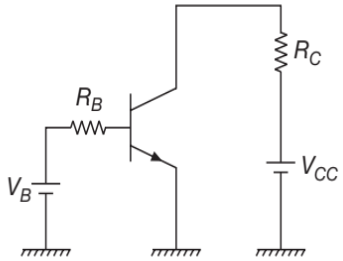
(A) NOT gate (B) OR gate
(C) AND gate (D) NOR gate

27. A piece of copper and another of germanium are cooled from room temperature to 77 K, the resistance of
(A) each of them increases
(B) each of them decreases
(C) copper decreases and germanium increases
(D) copper increases and germanium decreases

28. NAND and NOR gates are called universal gates primarily because they
(A) are available universally
(B) can be combined to produce OR, AND and NOT gates
(C) are widely used in Integrated circuit packages
(D) are easiest to manufacture

29. The value of β
(A) is always less than 1
(B) lies between 20 and 200
(C) is always greater than 200
(D) is always infinity

30. A common emitter amplifier circuit, built using an npn transistor, is shown in the figure.



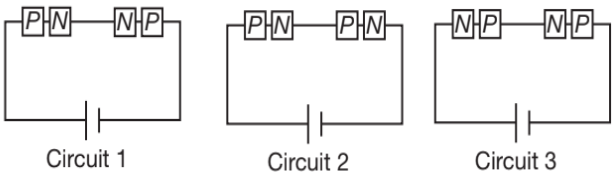
Its dc current gain is 250, $R_C=1\,\text{k}\Omega$ and $V_{CC}=10$ V. What is the minimum base current for V_{CE} to reach saturation?
(A) 10 μA (B) 100 μA
(C) 7 μA (D) 40 μA

31. The forbidden energy gap in conductors, semi-conductors and insulators are EG_1, EG_2 and EG_3 respectively. The relation among them is
(A) $EG_1=EG_2=EG_3$ (B) $EG_1>EG_2>EG_3$
(C) $EG_1<EG_2<EG_3$ (D) $EG_1<EG_2>EG_3$

32. The manifestation of band structure in solids is due to
(A) Heisenberg's uncertainty principle
(B) Pauli's exclusion principle
(C) Bohr's correspondence principle
(D) Boltzmann's law

33. The current gain α of a transistor is 0.95. The change in emitter current is 10 mA. The change in base current is
(A) 9.5 mA (B) 0.5 mA
(C) 10.5 mA (D) $\left(\frac{200}{19}\right)$ mA

34. Two identical pn junctions may be connected in series with a battery in three ways as shown in figure. The potential drops across the two pn junctions are equal in



(A) circuit 1 and circuit 2 (B) circuit 2 and circuit 3
(C) circuit 3 and circuit 1 (D) circuit 1 only

35. An example of n-type semiconductor is
(A) pure germanium
(B) pure silicon
(C) silicon doped with phosphorus
(D) germanium doped with boron

36. The energy band gap is maximum in
(A) metals (B) superconductors
(C) insulators (D) semiconductors

37. When a *pn* junction diode is reverse biased, the flow of current across the junction is mainly due to
(A) diffusion of charges.
(B) drift of charges.
(C) both drift and diffusion of charges.
(D) either drift or diffusion depending upon the nature of the material.

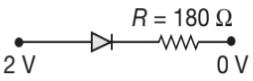
38. When *p-n* junction diode is forward biased, then
(A) The depletion region is reduced and barrier height is increased
(B) The depletion region is widened and barrier height is reduced
(C) both the depletion region and barrier height are reduced
(D) both the depletion region and barrier height are increased

39. An *n*-type semiconductor has resistivity $0.1\,\Omega m$. The number of donor atoms which must be added to achieve this is $\left(\mu_e = 0.05\ m^2V^{-1}s^{-1}\right)$
(A) 1.25×10^{17} (B) 1.25×10^{23}
(C) 1.25×10^{21} (D) 1.25×10^{22}

40. When pure germanium is doped with trivalent impurity like aluminium; the conduction is due to
(A) electrons (B) holes
(C) protons (D) positrons

41. In a common base amplifier, the phase difference between the input signal voltage and output voltage is
(A) 0 (B) $\frac{\pi}{2}$
(C) $\frac{\pi}{4}$ (D) π

42. Assuming that the silicondiode having resistance of 20 Ω, the current through the diode is (knee voltage 0.7 V)



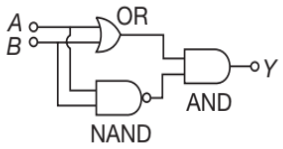
(A) 0 mA (B) 10 mA
(C) 6.5 mA (D) 13.5 mA

43. In a common-emitter transistor amplifier circuit $\beta = 100$, input resistance $R_1 = 1\ k\Omega$, output resistance $R_2 = 10\ k\Omega$. The voltage gain of circuit is
(A) 100 (B) 1000
(C) 10 (D) 5000

44. The electrical conductivity of a semiconductor increases when electromagnetic radiation of wavelength shorter than 2480 nm is incident on it. The band gap in (eV) for the semiconductor is
(A) 0.5 eV (B) 0.7 eV
(C) 1.1 eV (D) 2.5 eV

45. If the forward voltage in a semiconductor diode is doubled, the width of depletion layer
(A) increases
(B) decreases
(C) remains unchanged
(D) becomes zero

46. The following configuration of gate is equivalent to

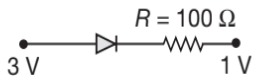


(A) NAND (B) XOR
(C) OR (D) NOR

47. An *npn* transistor is used in common emitter configuration as an amplifier with 1 kΩ load resistance. Signal voltage of 10 mV is applied across the base-emitter. This produces a 3 mA change in the collector current and 15 μA change in the base current of the amplifier. The input resistance and voltage gain are
(A) 0.33 kΩ, 1.5
(B) 0.33 kΩ, 300
(C) 0.67 kΩ, 200
(D) 0.67 kΩ, 300

48. One serious drawback of semi-conductor devices is
(A) they do not last for long time.
(B) they are costly.
(C) they cannot be used with high voltage.
(D) they pollute the environment.

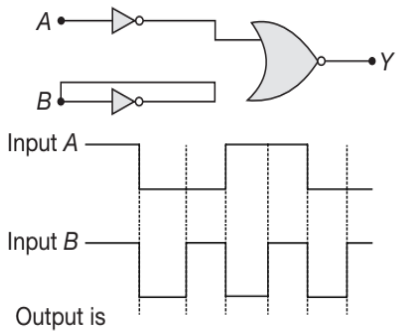
49. Assuming that the junction diode is ideal, the current through the diode is

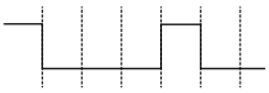


(A) 0 (B) 2 mA
(C) 20 mA (D) 200 mA

50. In a full wave rectifier circuit operating from 50 Hz mains frequency, the fundamental frequency in the ripple would be
(A) 100 Hz (B) 70.7 Hz
(C) 50 Hz (D) 25 Hz

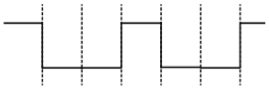
51. The logic circuit shown below has the input waveforms *A* and *B* as shown. Pick out the correct output waveform



(A) 

(B) 

(C) 

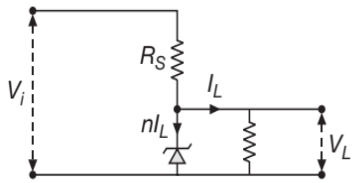
(D) 

52. A p-type semiconductor has acceptor level 57 meV above the valence band. The maximum wavelength of light required to create a hole is

(A) 57 Å (B) 57×10^{-3} Å

(C) 217100 Å (D) 11.61×10^{-33} Å

53. The value of the resistor, R_S, needed in the dc voltage regulator circuit shown here, equals



(A) $\dfrac{(V_i - V_L)}{nI_L}$ (B) $\dfrac{(V_i + V_L)}{nI_L}$

(C) $\dfrac{(V_i - V_L)}{(n+1)I_L}$ (D) $\dfrac{(V_i + V_L)}{(n+1)I_L}$

54. The ratio of forward biased to reverse biased resistance for pn junction diode is

(A) $10^{-1}:1$ (B) $10^{-2}:1$

(C) $10^{4}:1$ (D) $10^{-4}:1$

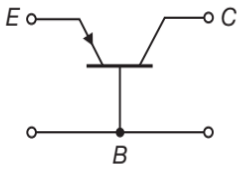
55. A solid which is transparent to visible light and whose conductivity increases with temperature is formed by

(A) metallic bonding
(B) ionic bonding
(C) covalent bonding
(D) van der Waals bonding

56. With the rise in temperature, the specific resistance of a semiconductor

(A) increases
(B) remains unchanged
(C) decreases
(D) first decreases and then increases

57. For circuit shown in figure $I_E = 4$ mA, $I_B = 40\ \mu$A. What are the values of α and I_C?



(A) 0.99, 3.96 mA (B) 1.01, 4.04 mA

(C) 0.97, 4.04 mA (D) 0.99, 4.04 mA

58. The width of the depletion layer in a pn junction diode

(A) increases when a reverse bias is applied.
(B) increases when a forward bias is applied.
(C) decreases when a reverse bias is applied.
(D) remains the same, irrespective of the bias voltage.

59. By increasing the temperature, the specific resistance of a conductor and a semiconductor

(A) increases for both (B) decreases for both

(C) increases, decreases (D) decreases, increases

60. In the ratio of the concentration of electrons that of holes in a semiconductor is $\dfrac{7}{5}$ and the ratio of currents is $\dfrac{7}{4}$ then what is the ratio of their drift velocities?

(A) $\dfrac{4}{7}$ (B) $\dfrac{5}{8}$

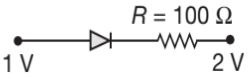
(C) $\dfrac{4}{5}$ (D) $\dfrac{5}{4}$

61. A multistage amplifier has the overall voltage gain of 150. The gain is reduced to 25 when a negative feedback is applied. What is the fraction of the output that is fed back to the input?

(A) $\dfrac{1}{30}$ (B) $\dfrac{1}{20}$

(C) $-\dfrac{1}{30}$ (D) $\dfrac{1}{6}$

62. Assuming that the junction diode is ideal, the current in the arrangement shown in figure is



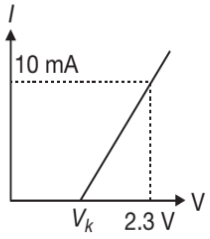
(A) 0 mA (B) 2 mA
(C) 10 mA (D) 30 mA

63. The current gain α of a transistor is defined as
(A) the ratio of change in collector current to the change in emitter current for a constant value of collector voltage in a common base arrangement.
(B) the ratio of change in collector current to the change in base current for a constant collector voltage in a common collector arrangement.
(C) the ratio of change in collector current to the change in base current for a constant collector voltage in a common emitter arrangement.
(D) the ratio of change in emitter current to the change in collector current for a constant emitter voltage in a common emitter arrangement.

64. The value of $\bar{1}+\bar{1}$ is
(A) 2 (B) 0
(C) 1 (D) 10

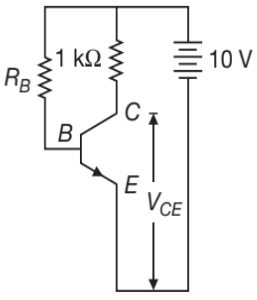
65. In common base mode of a transistor, the collector current is 5.488 mA for an emitter current of 5.60 mA. The value of the base current amplification factor (β) will be
(A) 48 (B) 49
(C) 50 (D) 51

66. The resistance of a germanium junction diode whose V-I is shown in figure is $(V_k = 0.3\ \text{V})$



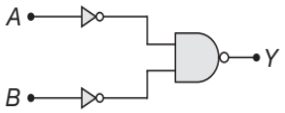
(A) 5 kΩ (B) 0.2 kΩ
(C) 2.3 kΩ (D) $\left(\frac{10}{2.3}\right)$kΩ

67. In the circuit shown here the transistor used has a current gain $\beta = 100$. What should be the bias resistor R_B so that $V_{CE} = 5$ V ? (neglect V_{BE})



(A) 2×10^3 Ω (B) 200×10^3 Ω
(C) 1×10^6 Ω (D) 500 Ω

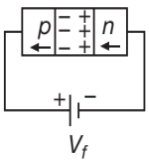
68. The logic gate equivalent to the given logic circuit is

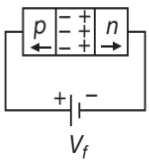


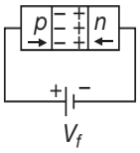
(A) OR (B) NAND
(C) AND (D) NOR

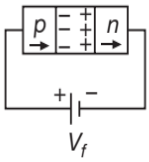
69. At absolute zero, Si acts as
(A) non-metal (B) metal
(C) insulator (D) None of these.

70. In the case of forward biasing of a pn junction diode, which one of the following figures correctly depicts the direction of flow of current

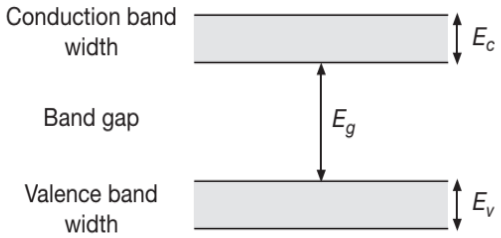
(A)


(B)


(C)


(D)


71. If the lattice constant of this semiconductor is decreased, then which of the following is correct?



(A) all E_c, E_g, E_v decrease
(B) all E_c, E_g, E_v increase
(C) E_c and E_v increase, but E_g decreases
(D) E_c and E_v decrease, but E_g increases

72. In a semiconductor the forbidden energy gap between the valency band and the conduction band is of the order of
(A) 1 eV (B) 5 eV
(C) 1 keV (D) 1 MeV

73. An experiment is performed to determine the I-V characteristics of a Zener diode, which has a protective resistance of $R = 100\ \Omega$, and a maximum power of

dissipation rating of 1 W. The minimum voltage range of the *DC* source in the circuit is

(A) 0 – 5 V (B) 0 – 24 V
(C) 0 – 12 V (D) 0 – 8 V

74. In a bridge rectifier, the number of diodes required is
(A) 1 (B) 2
(C) 3 (D) 4

75. At absolute zero temperature a crystal of pure germanium
(A) behaves as perfect conductor
(B) behaves as perfect insulator
(C) contains no electron
(D) None of the above

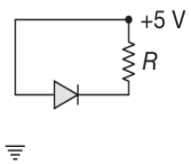
76. In a transistor the value of β is 100, the value of α is
(A) 0.01 (B) 0.1
(C) 0.99 (D) 1

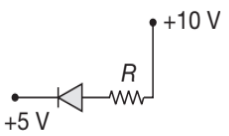
77. The type of binding in germanium crystal is
(A) ionic (B) metallic
(C) covalent (D) vander Waal's

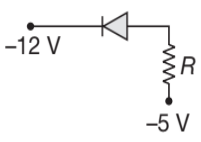
78. When *npn* transistor is used as an amplifier, then
(A) electrons move from collector to emitter
(B) electrons move from emitter to collector
(C) electrons move from collector to base
(D) holes move from emitter to collector

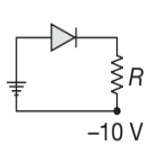
79. An *npn* transistor operates as a common emitter amplifier, with a power gain of 60 dB . The input circuit resistance is 100 Ω and the output load resistance is 10 kΩ . The common emitter current gain β is
(A) 10^4 (B) 6×10^2
(C) 10^2 (D) 60

80. In the following, which one of the diodes is reverse biased?

(A) 

(B) 

(C) 

(D) 

81. The intrinsic conductivity of germanium at 27° is 2.13 mhom^{-1} and mobilities of electrons and holes are 0.38 and 0.18 $m^2V^{-1}s^{-1}$ respectively. The density of charge carriers is
(A) 2.37×10^{19} m^{-3} (B) 3.28×10^{19} m^{-3}
(C) 7.83×10^{19} m^{-3} (D) 8.47×10^{18} m^{-3}

82. In a common base configuration $I_E = 1$ mA, $I_C = 0.95$ mA . The value of base current is
(A) 1.95 mA (B) 0.05 mA
(C) 1.05 mA (D) 0.95 mA

83. Read the following statements carefully
Y: The resistivity of a semiconductor decreases with increase of temperature
Z: In a conducting solid, the rate of collisions between free electrons and ions increases with increase of temperature
State the correct statement(s) from the following
(A) Y is true but Z is false
(B) Y is false but Z is true
(C) Both Y and Z are true
(D) Y is true and Z is the correct reason for Y

84. The transfer ratio β of a transistor is 50. The input resistance of the transistor when used in the common emitter mode is 1 kΩ. The peak value of the collector alternating current for an input peak voltage of 0.01 V is
(A) 100 μA (B) 500 μA
(C) 0.01 μA (D) 0.25 μA

85. Two *pnp* transistors in series give
(A) a positive OR circuit
(B) a negative OR circuit
(C) a positive AND circuit
(D) a negative AND circuit

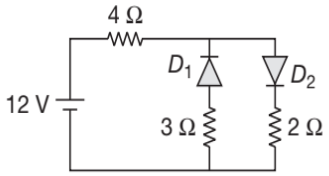
86. An oscillator is nothing but an amplifier with
(A) positive feedback (B) large gain
(C) no feedback (D) negative feedback

87. The dominant mechanisms for motion of charge carriers in forward and reverse biased silicon *pn* junctions are
(A) drift in forward bias, diffusion in reverse bias.
(B) diffusion in forward bias, drift in reverse bias.
(C) diffusion in both forward and reverse bias.
(D) drift in both forward and reverse bias.

88. What is voltage gain in a common emitter amplifier when input resistance is 3 Ω and the load resistance 24 Ω with $\beta = 60$
(A) 8.4 (B) 4.8
(C) 2.4 (D) 480

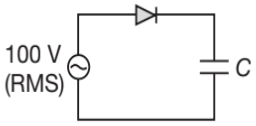
89. A semiconductor is cooled from T_1 K to T_2 K. Its resistance
(A) will decrease.
(B) will increase.
(C) will first decrease and then increase.
(D) will not change.

90. The circuit has two oppositely connect ideal diodes in parallel. What is the current following in the circuit?



(A) 1.33 A (B) 1.71 A
(C) 2.00 A (D) 2.31 A

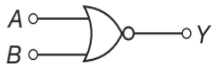
91. A sinusoidal voltage of r.m.s. value 100 V is connected to an ideal junction diode as shown in figure. The maximum potential difference across the capacitor will be



(A) 100 V (B) $100\sqrt{2}$ V
(C) $50\sqrt{2}$ V (D) ZERO

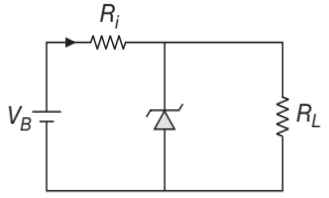
92. In germanium the energy gap is about 0.75 eV. The wavelength of light which germanium starts absorbing is
(A) 5000 Å (B) 1650 Å
(C) 16500 Å (D) 165000 Å

93. The logic symbol shown in figure represents



(A) OR gate (B) XOR gate
(C) NAND gate (D) NOR gate

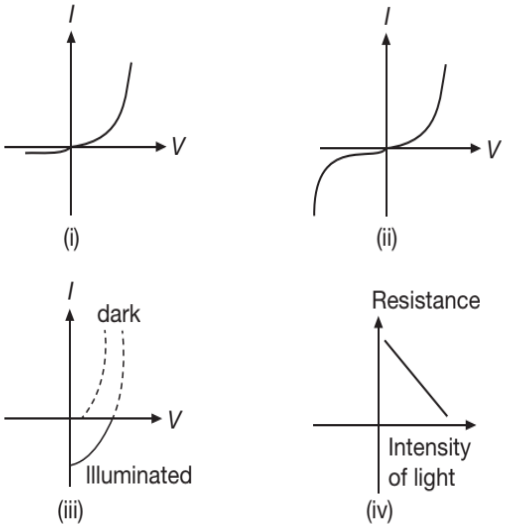
94. The figure represents a voltage regulator circuit using a Zener diode. The breakdown voltage of the Zener diode is 6 V and the load resistance is, $R_L = 4\ \text{k}\Omega$. The series resistance of the circuit is $R_i = 1\ \Omega$. If the battery voltage V_B varies from 8 V to 16 V, what are the minimum and maximum values of the current through Zener diode?



(A) 0.5 mA , 6 mA (B) 0.5 mA , 8.5 mA
(C) 1.5 mA , 8.5 mA (D) 1 mA 8.5 mA

95. In the depletion region of an unbiased *pn* junction diode, there are
(A) only electrons
(B) only holes
(C) both electrons and holes
(D) only fixed ions

96. Identify the semiconductor devices whose characteristics are given below, in the order (i), (ii), (iii), (iv)



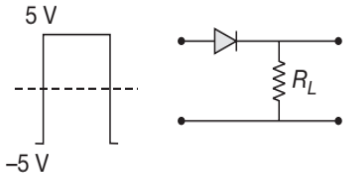
(A) Zener diode, Solar cell, Simple diode, Light dependent resistance
(B) Simple diode, Zener diode, Solar cell, Light dependent resistance
(C) Zener diode, Simple diode, Light dependent resistance, Solar cell
(D) Solar cell, Light dependent resistance, Zener diode, Simple diode

97. Which one of the following logic gates does the truth table represent

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

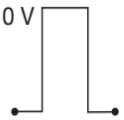
(A) NOT (B) NOR
(C) OR (D) AND

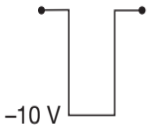
98. If in a *p-n* junction diode, a square input signal of 10 V is applied as shown

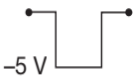


Then the output signal across R_L will be

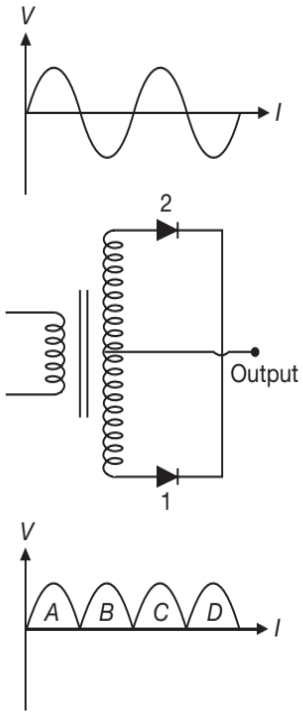
(A) 

(B) 

(C) 

(D) 

99. A full wave rectifier circuit along with the output is shown in figure



This contribution from the diode 1 is

(A) C (B) A, C
(C) B, D (D) A, B, C, D

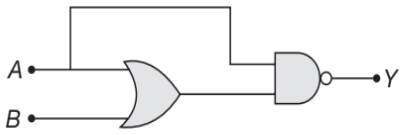
100. When the temperature of a semiconductor is increased, its electrical conductivity

(A) increases
(B) remains the same
(C) decreases
(D) first increases and then decreases

101. The voltage gain of an amplifier without feedback is 100. If a negative feedback is introduced, with a feedback fraction $\beta = 0.1$, then the gain of the feed back amplifier is

(A) 9.09 (B) 10
(C) 100.1 (D) 90.0

102. The truth table for the circuit given in the figure is



(A)

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

(B)

A	B	Y
0	0	0
0	1	0
1	0	1
1	1	1

(C)

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	1

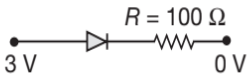
(D)

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	0

103. While using a transistor as an amplifier

(A) the collector junction is forward biased and emitter junction reverse biased.
(B) the collector junction is reverse biased and emitter junction is forward biased.
(C) both the junctions are forward biased.
(D) both the junctions are reverse biased.

104. Assuming that the silicon diode (having negligible resistance), the current through the diode is (knee voltage of silicon diode 0.7 V)

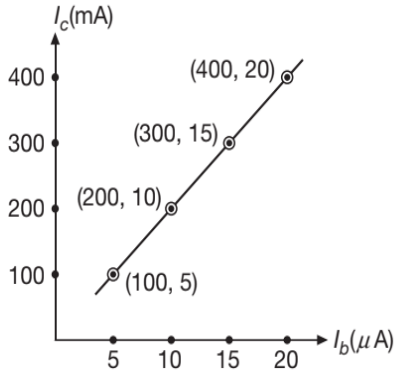


(A) 0 mA
(B) 7 mA
(C) 2.3 mA
(D) 23 mA

105. *npn* transistors are preferred to *npn* transistors because they have

(A) low cost
(B) low dissipation of energy
(C) capable of handling large power
(D) electrons have high mobility than holes and hence high mobility of energy

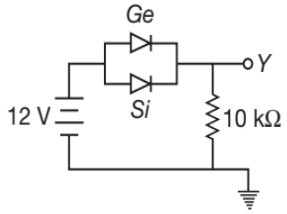
106. The transfer characteristic curve of a transistor, having input and output resistance 100 Ω and 100 kΩ respectively, is shown in the figure. The voltage and power gain, are respectively



(A) 5×10^4, 2.5×10^6 (B) 2.5×10^4, 2.5×10^6
(C) 5×10^4, 5×10^6 (D) 5×10^4, 5×10^5

107. Carbon, silicon and germanium have four valence electrons each. At room temperature which one of the following statements is most appropriate?
(A) The number of free electrons for conduction is significant only in *Si* and *Ge* but small in *C*.
(B) The number of free conduction electrons is significant in *C* but small in *Si* and *Ge*.
(C) The number of free conduction electrons is negligibly small in all the three.
(D) The number of free electrons for conduction is significant in all the three.

108. Two junction diodes one of Germanium (Ge) and other of silicon (Si) are connected as shown in figure to a battery of emf 12 V and a load resistance 10 kΩ. The germanium diode conducts at 0.3 V and silicon diode at 0.7 V. When a current flows in the circuit, the potential of terminal Y will be

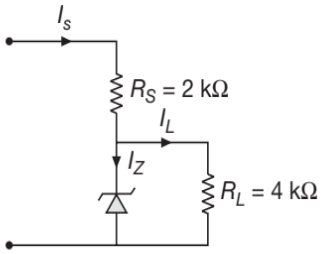


(A) 12 V (B) 11 V
(C) 11.3 V (D) 11.7 V

109. In PROBLEM 108, if the polarity of *Ge* diode are reversed, and a current flows, the potential of point *Y* will be
(A) 12 V (B) 11 V
(C) 11.3 V (D) 11.7 V

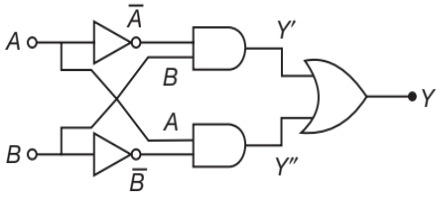
110. A hole in a *p*-type semiconductor is
(A) an excess electron
(B) a missing electron
(C) a missing atom
(D) a donor level

111. Figure shows a *DC* voltage regulator circuit, with a Zener diode of breakdown voltage 6 V. If the unregulated input voltage varies between 10 V to 16 V, then what is the maximum Zener current?



(A) 7.5 mA (B) 1.5 mA
(C) 2.5 mA (D) 3.5 mA

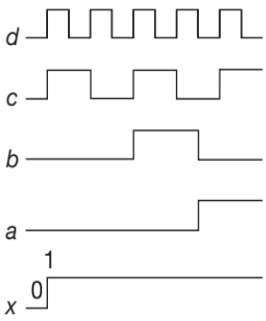
112. The following circuit represents



(A) OR gate (B) XOR gate
(C) AND gate (D) NAND gate

113. $A+\bar{A}$ is equal to
(A) 1 (B) 0
(C) A (D) $A\bar{A}$

114. If a, b, c, d are inputs to a gate and x is its output, then as per the following time graph, the gate is



(A) NAND (B) NOT
(C) AND (D) OR

115. In which of the following figures, the junction diode is forward biased
(A) +0 V ——▷|—— +5 V
(B) +5 V ——▷|—— +10 V
(C) −5 V ——▷|—— 0 V
(D) 0 V ——▷|—— −5 V

116. The energy gap of silicon is 1.14 eV. The maximum wavelength at which silicon will begin absorbing energy is

(A) 10855 Å (B) 1085.5 Å

(C) 108.55 Å (D) 10.855 Å

117. The only function of a NOT gate is to

(A) stop a signal

(B) invert an input signal

(C) recomplement a signal

(D) act as a universal gate

118. Mobility of electrons in a semiconductor is defined as the ratio of their drift velocity to the applied electric field. If, for an *n*-type semiconductor, the density of electrons is 10^{19} m^{-3} and their mobility is 1.6 $m^2V^{-1}s^{-1}$ then the resistivity of the semiconductor (since it is an *n*-type semiconductor contribution of holes is ignored) is close

(A) 2 Ωm (B) 0.2 Ωm

(C) 0.4 Ωm (D) 4 Ωm

119. The collector current in *npn* transistor circuit is 19 mA. What is the base current if 95% of the electrons emitted reach the collector?

(A) 1 mA (B) 2 mA

(C) 0.5 mA (D) 0.75 mA

120. A truth table is given below

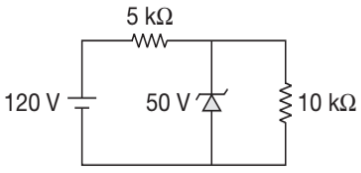
A	B	Y
0	0	1
1	0	0
0	1	0
1	1	0

Which of the following follows this truth table?

(A) XOR gate (B) NOR gate

(C) AND gate (D) OR gate

121. For the circuit shown below, the current through the Zener diode is



(A) Zero (B) 9 mA

(C) 14 mA (D) 5 mA

122. The input impedance of the *npn* transistor in common emitter mode (in standard notations) is given by

(A) $Z_i = \left(\frac{\Delta V_{BE}}{\Delta I_B}\right)_{V_{CE}}$ (B) $Z_i = \left(\frac{\Delta I_B}{\Delta V_{BE}}\right)_{V_{CE}}$

(C) $Z_i = \left(\frac{\Delta I_C}{\Delta I_B}\right)_{V_{CE}}$ (D) $Z_i = \left(\frac{\Delta I_C}{\Delta V_{CE}}\right)_{I_B}$

123. The current gain β may be defined as

(A) The ratio of change in collector current to the change in emitter current for a constant collector voltage in a common base arrangement.

(B) The ratio of change in collector current to the change in base current at constant collector voltage in a common emitter circuit.

(C) The ratio of change in emitter current to the change in base current for constant emitter voltage in common emitter circuit.

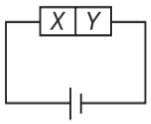
(D) The ratio of change in base current to the change in collector current at constant collector voltage in common emitter circuit.

124. The current gain in the common emitter mode of a transistor is 10. The input impedance is 20 kΩ and load resistance is 100 kΩ. The power gain is

(A) 100 (B) 200

(C) 500 (D) 300

125. A semiconductor X is made by doping a germanium crystal 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. Which of the following statements is correct?



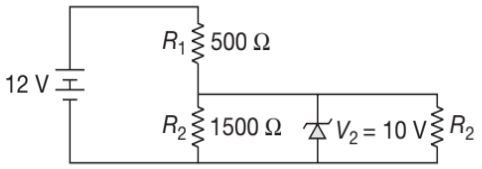
(A) X is *p*–type, Y is *n*-type and the junction is forward biased

(B) X is *n*–type, Y is *p*-type and the junction is forward biased

(C) X is *p*–type, Y is *n*-type and the junction is reverse biased

(D) X is *n*–type, Y is *p*-type and the junction is reverse biased

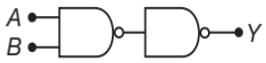
126. In the given circuit the current through Zener Diode is close to



(A) 6.7 mA (B) 0.0 mA
(C) 4.0 mA (D) 6.0 mA

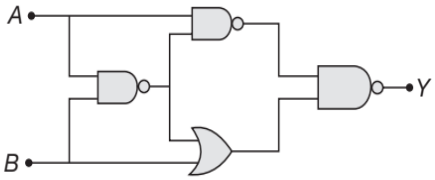
127. Boolean expression $Y = A\bar{B} + B\bar{A}$ is given
If $A = 1, B = 1$ then, $Y = ?$
(A) 0 (B) 1
(C) 11 (D) 10

128. The arrangement shown in figure performs the logic function of



(A) AND gate
(B) NAND gate
(C) OR gate
(D) XOR gate

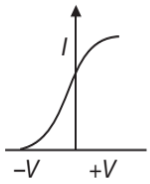
129. The output of the given logic circuit is



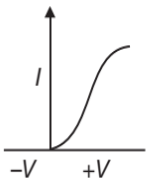
(A) $A\bar{B} + \bar{A}B$ (B) $A\bar{B}$
(C) $AB + \overline{AB}$ (D) $\bar{A}B$

130. Different voltages are applied across a pn junction and the currents are measured for each value. Which of the following graphs is obtained between voltage (V) and current (I)

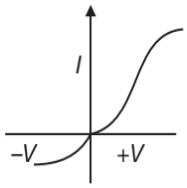
(A)



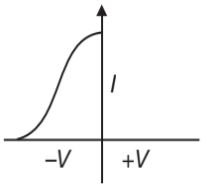
(B)



(C)



(D)

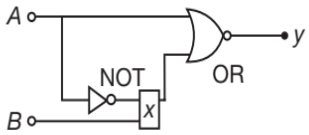


131. In positive logic, logic state 1 corresponds
(A) positive voltage
(B) zero voltage
(C) lower voltage level
(D) higher voltage level

132. The logic circuit shown in the following figure yields the given truth table

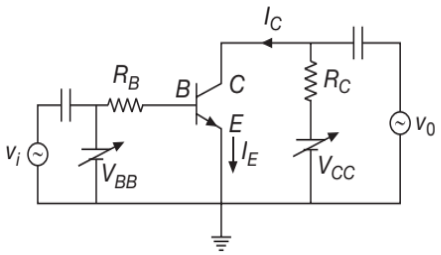
A	B	Y
1	1	1
0	1	1
1	0	1
0	0	0

The gate X in the diagram is



(A) NAND (B) XOR
(C) AND (D) NOR

133. In the figure, given that V_{BB} supply can vary from 0 to 5.0 V, $V_{CC} = 5$ V, $\beta_{dc} = 200$, $R_B = 100$ kΩ, $R_C = 1$ kΩ and $V_{BE} = 1.0$ V. The minimum base current and the input voltage at which the transistor will go to saturation, will be respectively



(A) 25 μA and 3.5 V (B) 20 μA and 2.8 V
(C) 25 μA and 2.8 V (D) 20 μA and 3.5 V

134. The electrical conductivity of semiconductor increases, when em radiation of wavelength shorter than 2480 nm is incident on it. The band gap (in eV) for the semiconductor is
(A) 0.9 (B) 0.7
(C) 0.5 (D) 1.1

135. The truth table given below is for

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

(A) OR (B) AND
(C) XNOR (D) XOR

136. The truth table of a logic gate is

A	B	Y
1	1	0
1	0	1
0	1	1
0	0	1

The logic gate is
(A) NAND (B) AND
(C) XOR (D) NOT

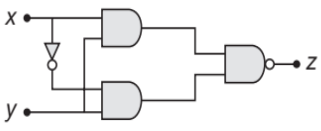
137. Holes are charge carries in
(A) intrinsic semiconductors
(B) *n*-type semiconductors
(C) *p*-type semiconductors
(D) all the above

138. A working transistor with its three legs marked P, Q and R is tested using a multimeter. No conduction is found between P and Q. By connecting the common (negative) terminal of the multimeter to R and the other (positive) terminal to P or Q, some resistance is seen on the multimeter. Which of the following is true for the transistor?
(A) It is an *npn* transistor with R as collector.
(B) It is an *npn* transistor with R as base.
(C) It is a *pnp* transistor with R as collector.
(D) It is a *pnp* transistor with R as emitter.

139. When pure germanium is doped with pentavalent impurity like phosphorus the conduction is due to
(A) electrons
(B) holes
(C) protons
(D) positrons

140. The value of α
(A) is always less than 1
(B) is always greater than 1
(C) may be less or greater than 1
(D) None of the above

141. Truth table for the following digital circuit will be



(A)

x	y	z
0	0	1
0	1	1
1	0	1
1	1	1

(B)

x	y	z
0	0	0
0	1	0
1	0	0
1	1	1

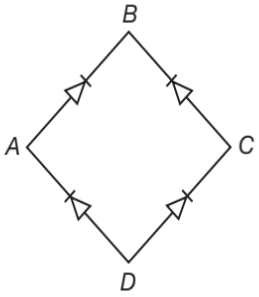
(C)

x	y	z
0	0	0
0	1	1
1	0	1
1	1	1

(D)

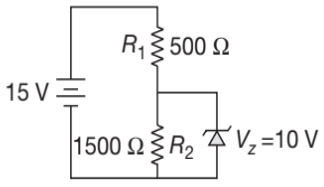
x	y	z
0	0	1
0	1	1
1	0	1
1	1	0

142. In the diagram the input is across the terminals A and C and output is across B and D. Then the output is



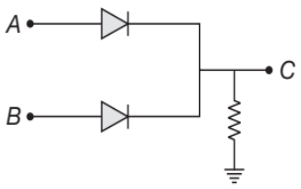
(A) zero
(B) same as input
(C) full wave rectified
(D) half wave rectified

143. In the given circuit, the current through Zener diode is



(A) 6.7 mA (B) 3.3 mA
(C) 2.5 mA (D) 5.5 mA

144. In the circuit below, A and B represent two inputs and C represents the output. The circuit represents



(A) OR gate (B) NOR gate
(C) AND gate (D) NAND gate

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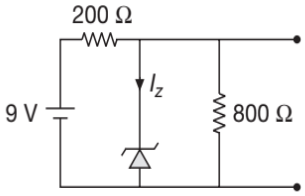
1. [Online April 2019]

The reverse breakdown voltage of a Zener diode is 5.6 V in the given circuit.



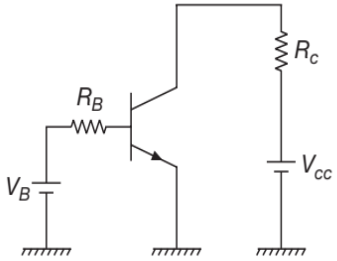
The current I_Z through the Zener is

(A) 15 mA (B) 7 mA

(C) 10 mA (D) 17 mA

2. [Online April 2019]

A common emitter amplifier circuit, built using an npn transistor, is shown in the figure.



Its *dc* current gain is 250, $R_C = 1\ k\Omega$ and $V_{CC} = 10$ V. What is the minimum base current for V_{CE} to reach saturation?

(A) 10 μA (B) 100 μA

(C) 7 μA (D) 40 μA

3. [Online April 2019]

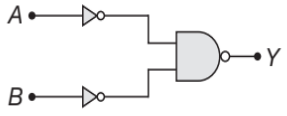
An NPN transistor is used in common emitter configuration as an amplifier with 1 kΩ load resistance. Signal voltage of 10 mV is applied across the base-emitter. This produces a 3 mA change in the collector current and 15 μA change in the base current of the amplifier. The input resistance and voltage gain are

(A) 0.33 kΩ, 1.5 (B) 0.33 kΩ, 300

(C) 0.67 kΩ, 200 (D) 0.67 kΩ, 300

4. [Online April 2019]

The logic gate equivalent to the given logic circuit is



(A) OR (B) NAND

(C) AND (D) NOR

5. [Online April 2019]

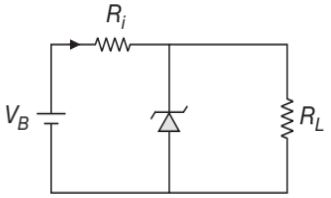
An npn transistor operates as a common emitter amplifier, with a power gain of 60 dB. The input circuit resistance is 100 Ω and the output load resistance is 10 kΩ. The common emitter current gain β is

(A) 10^4 (B) 6×10^2

(C) 10^2 (D) 60

6. [Online April 2019]

The figure represents a voltage regulator circuit using a Zener diode. The breakdown voltage of the Zener diode is 6 V and the load resistance is, $R_L = 4\ k\Omega$. The series resistance of the circuit is $R_i = 1\ \Omega$. If the battery voltage V_B varies from 8 V to 16 V, what are the minimum and maximum values of the current through Zener diode?

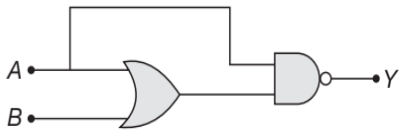


(A) 0.5 mA, 6 mA (B) 0.5 mA, 8.5 mA

(C) 1.5 mA, 8.5 mA (D) 1 mA 8.5 mA

7. [Online April 2019]

The truth table for the circuit given in the figure is



(A)

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

(B)

A	B	Y
0	0	0
0	1	0
1	0	1
1	1	1

(C)

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	1

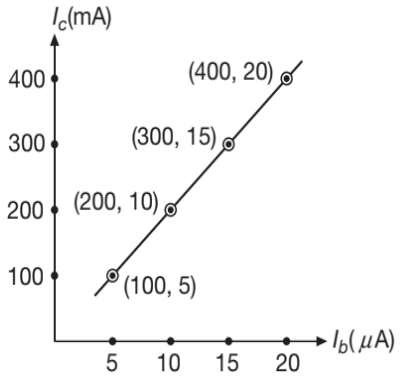
(D)

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	0

8. [Online April 2019]

The transfer characteristic curve of a transistor, having

input and output resistance 100 Ω and 100 kΩ respectively, is shown in the figure. The voltage and power gain, are respectively

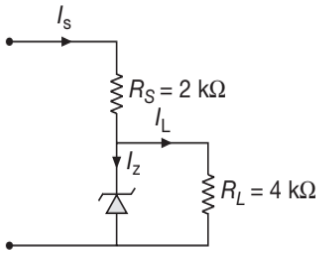


(A) 5×10^4, 2.5×10^6 (B) 2.5×10^4, 2.5×10^6

(C) 5×10^4, 5×10^6 (D) 5×10^4, 5×10^5

9. [Online April 2019]

Figure shows a *DC* voltage regulator circuit, with a Zener diode of breakdown voltage 6 V . If the unregulated input voltage varies between 10 V to 16 V , then what is the maximum Zener current?



(A) 7.5 mA (B) 1.5 mA

(C) 2.5 mA (D) 3.5 mA

10. [Online January 2019]

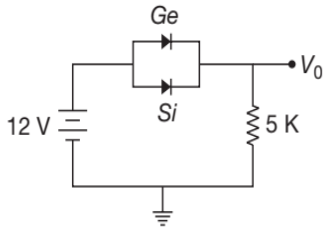
Mobility of electrons in a semiconductor is defined as the ratio of their drift velocity to the applied electric field. If, for an *n*-type semiconductor, the density of electrons is 10^{19} m^{-3} and their mobility is 1.6 $m^2V^{-1}s^{-1}$ then the resistivity of the semiconductor (since it is an *n*-type semiconductor contribution of holes is ignored) is close

(A) 2 Ωm (B) 0.2 Ωm

(C) 0.4 Ωm (D) 4 Ωm

11. [Online January 2019]

Ge and *Si* diodes start conducting at 0.3 V and 0.7 V respectively. In the following figure if *Ge* diode connection are reversed, the value of V_0 changes by: (assume that the *Ge* diode has large breakdown voltage)

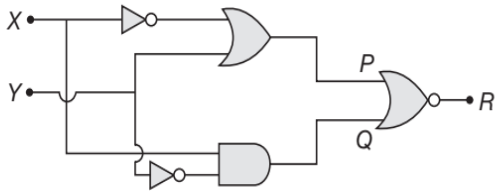


(A) 0.2 V (B) 0.4 V

(C) 0.6 V (D) 0.8 V

12. [Online January 2019]

To get output 1 at *R* , for the given logic gate circuit the input values must be

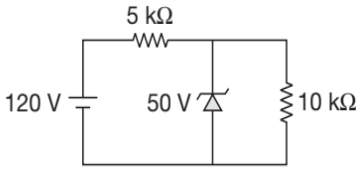


(A) $X=1$, $Y=1$ (B) $X=0$, $Y=0$

(C) $X=1$, $Y=0$ (D) $X=0$, $Y=1$

13. [Online January 2019]

For the circuit shown below, the current through the Zener diode is

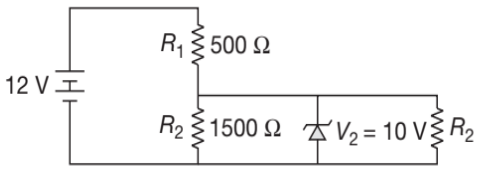


(A) Zero (B) 9 mA

(C) 14 mA (D) 5 mA

14. [Online January 2019]

In the given circuit the current through Zener Diode is close to

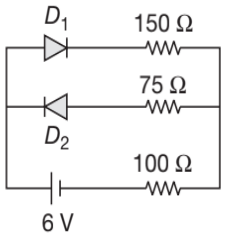


(A) 6.7 mA (B) 0.0 mA

(C) 4.0 mA (D) 6.0 mA

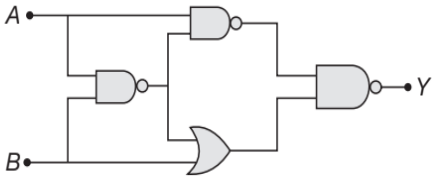
15. [Online January 2019]

The circuit shown below contains two ideal diodes, each with a forward resistance of 50 Ω . If the battery voltage is 6 V , the current through the 100 Ω resistance (in amperes) is



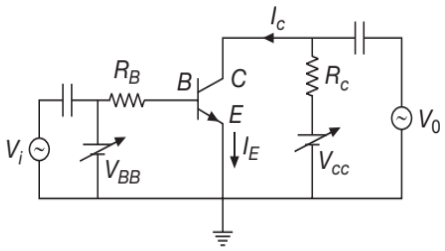
(A) 0.036 (B) 0.020
(C) 0.030 (D) 0.027

16. [Online January 2019]
The output of the given logic circuit is



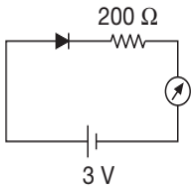
(A) $A\bar{B}+\bar{A}B$ (B) $A\bar{B}$
(C) $AB+\overline{AB}$ (D) $\bar{A}B$

17. [Online January 2019]
In the figure, given that V_{BB} supply can vary from 0 to 5.0 V, $V_{CC}=5$ V, $\beta_{dc}=200$, $R_B=100\ \text{k}\Omega$, $R_C=1\ \text{k}\Omega$ and $V_{BE}=1.0$ V. The minimum base current and the input voltage at which the transistor will go to saturation, will be respectively:



(A) 25 μA and 3.5 V
(B) 20 μA and 2.8 V
(C) 25 μA and 2.8 V
(D) 20 μA and 3.5 V

18. [2018]
The reading of the ammeter for a silicon diode in the given circuit is



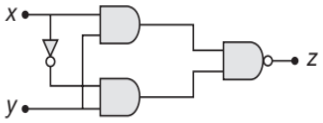
(A) 0 (B) 15 mA
(C) 11.5 mA (D) 13.5 mA

19. [Online 2018]
In a common emitter configuration with suitable bias, it is given that R_L is the load resistance and R_{BE} is small signal dynamic resistance (input side). Then, voltage gain, current gain and power gain are given, respectively, by (β is current gain, I_B, I_C and I_E are respectively base, collector and emitter currents.)

(A) $\beta\frac{R_L}{R_{BE}}, \frac{\Delta I_E}{\Delta I_B}, \beta^2\frac{R_L}{R_{BE}}$ (B) $\beta\frac{R_L}{R_{BE}}, \frac{\Delta I_C}{\Delta I_B}, \beta^2\frac{R_L}{R_{BE}}$

(C) $\beta^2\frac{R_L}{R_{BE}}, \frac{\Delta I_C}{\Delta I_E}, \beta^2\frac{R_L}{R_{BE}}$ (D) $\beta^2\frac{R_L}{R_{BE}}, \frac{\Delta I_C}{\Delta I_B}, \beta\frac{R_L}{R_{BE}}$

20. [Online 2018]
Truth table for the following digital circuit will be



(A)

x	y	z
0	0	1
0	1	1
1	0	1
1	1	1

(B)

x	y	z
0	0	0
0	1	0
1	0	0
1	1	1

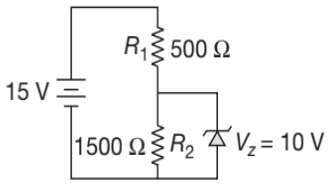
(C)

x	y	z
0	0	0
0	1	1
1	0	1
1	1	1

(D)

x	y	z
0	0	1
0	1	1
1	0	1
1	1	0

21. [Online 2018]
In the given circuit, the current through Zener diode is



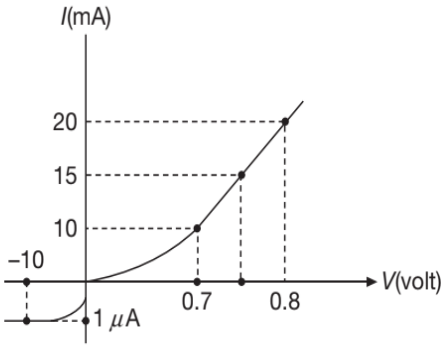
(A) 6.7 mA (B) 3.3 mA
(C) 2.5 mA (D) 5.5 mA

22. [2017]
In a common emitter amplifier circuit using an *n-p-n* transistor, the phase difference between the input and the output voltages will be

(A) 45° (B) 90°
(C) 135° (D) 180°

23. [Online 2017]

The V-I characteristic of a diode is shown in the figure. The ratio of forward to reverse bias resistance is



(A) 100 (B) 10^6

(C) 10 (D) 10^{-6}

24. [Online 2017]

What is the conductivity of a semiconductor sample having electron concentration of $5\times10^{18}\ m^{-3}$, hole concentration of $5\times10^{19}\ m^{-3}$, electron mobility of $2.0\ m^2V^{-1}s^{-1}$ and hole mobility of $0.01\ m^2V^{-1}s^{-1}$? (Take charge of electron as 1.6×10^{-19} C)

(A) $1.83\ (\Omega m)^{-1}$ (B) $1.68\ (\Omega m)^{-1}$

(C) $1.20\ (\Omega m)^{-1}$ (D) $0.59\ (\Omega m)^{-1}$

25. [Online 2017]

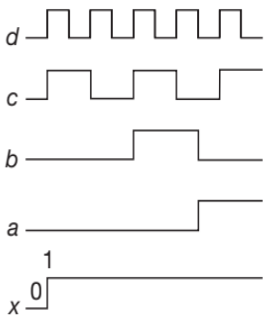
The current gain of a common emitter amplifier is 69. If the emitter current is 7.0 mA, collector current is

(A) 0.69 mA (B) 6.9 mA

(C) 69 mA (D) 9.6 mA

26. [2016]

If a, b, c, d are inputs to a gate and x is its output, then as per the following time graph, the gate is

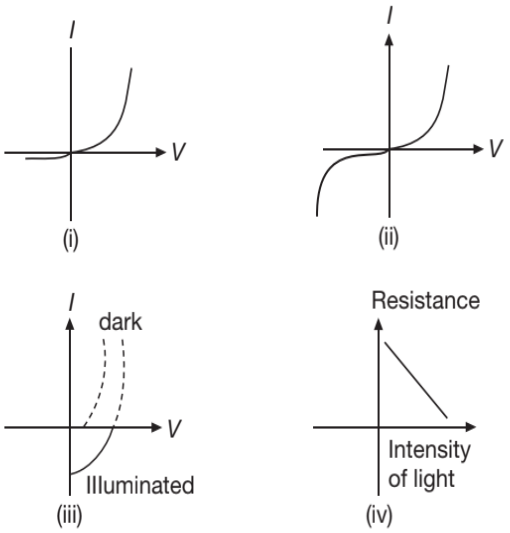


(A) NAND (B) NOT

(C) AND (D) OR

27. [2016]

Identify the semiconductor devices whose characteristics are given below, in the order (i), (ii), (iii), (iv)



(A) Zener diode, Solar cell, Simple diode, Light dependent resistance

(B) Simple diode, Zener diode, Solar cell, Light dependent resistance

(C) Zener diode, Simple diode, Light dependent resistance, Solar cell

(D) Solar cell, Light dependent resistance, Zener diode, Simple diode

28. [2016]

For a common emitter configuration, if α and β have their usual meanings, the incorrect relationship between α and β is

(A) $\alpha=\dfrac{\beta^2}{1+\beta^2}$ (B) $\dfrac{1}{\alpha}=\dfrac{1}{\beta}+1$

(C) $\alpha=\dfrac{\beta}{1-\beta}$ (D) $\alpha=\dfrac{\beta}{1+\beta}$

29. [Online 2016]

An unknown transistor needs to be identified as a *npn* or *pnp* type. A multimeter, with +ve and −ve terminals, is used to measure resistance between different terminals of transistor. If terminal 2 is the base of the transistor then which of the following is correct for a *pnp* transistor?

(A) +ve terminal 2, −ve terminal 3, resistance low

(B) +ve terminal 2, −ve terminal 1, resistance high

(C) +ve terminal 1, −ve terminal 2, resistance high

(D) +ve terminal 3, −ve terminal 2, resistance high

30. [Online 2016]

An experiment is performed to determine the I-V characteristics of a Zener diode, which has a protective resistance of $R=100\ \Omega$, and a maximum power of dissipation rating of 1 W. The minimum voltage range of the DC source in the circuit is

(A) 0 – 5 V (B) 0 – 24 V
(C) 0 – 12 V (D) 0 – 8 V

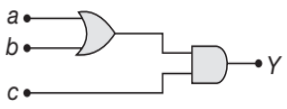
31. [Online 2016]
The truth table given in figure represents

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

(A) OR – Gate (B) NAND – Gate
(C) AND – Gate (D) NOR - Gate

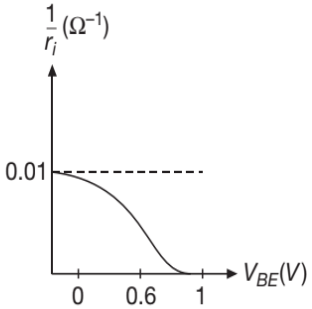
32. [Online 2016]
The ratio (R) of output resistance r_0 and the input resistance r_i in measurements of input and output characteristics of a transistor is typically in the range
(A) $R \sim 10^2 - 10^3$ (B) $R \sim 1 - 10$
(C) $R \sim 0.1 - 1.0$ (D) $R \sim 0.1 - 0.01$

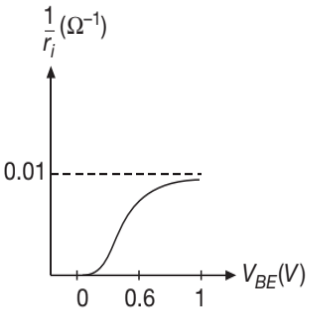
33. [Online 2016]
To get an output of 1 from the circuit shown in figure the input must be

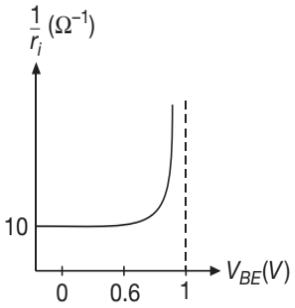


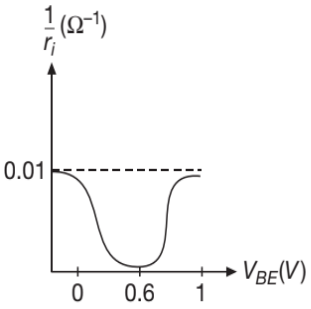
(A) $a = 0,\ b = 0,\ c = 1$
(B) $a = 1,\ b = 0,\ c = 0$
(C) $a = 1,\ b = 0,\ c = 1$
(D) $a = 0,\ b = 1,\ c = 0$

34. [Online 2016]
A realistic graph depicting the variation of the reciprocal of input resistance in an input characteristics measurement in a common emitter transistor configuration is

(A)


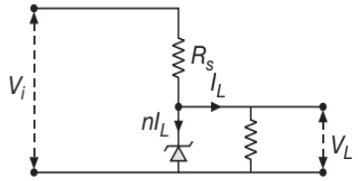
(B)


(C)


(D)


35. [Online 2015]
In an unbiased n-p junction electrons diffuse from n-region to p-region because
(A) holes in p-region attract them
(B) electrons travel across the junction due to potential difference
(C) electron concentration in n-region is more as compared to that in p-region
(D) only electrons move from n to p-region and not the vice-versa

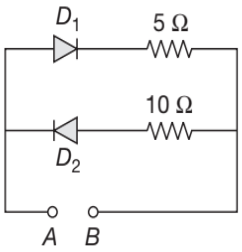
36. [Online 2015]
The value of the resistor, R_S, needed in the dc voltage regulator circuit shown here, equals



(A) $\dfrac{(V_i - V_L)}{nI_L}$ (B) $\dfrac{(V_i + V_L)}{nI_L}$
(C) $\dfrac{(V_i - V_L)}{(n+1)I_L}$ (D) $\dfrac{(V_i + V_L)}{(n+1)I_L}$

37. [Online 2015]

A 2 V battery is connected across AB as shown in the figure. The value of the current supplied by the battery when in one case battery's positive terminal is connected to A and in other case when positive terminal of battery is connected to B will respectively be



(A) 0.2 A and 0.1 A (B) 0.4 A and 0.2 A
(C) 0.1 A and 0.2 A (D) 0.2 A and 0.4 A

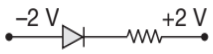
38. [2014]

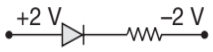
The current voltage relation of diode is given by $I = \left(e^{1000V/T} - 1\right)$ mA, where the applied voltage V is in volts and the temperature T is in degree kelvin. If a student makes an error measuring ±0.01 V while measuring the current of 5 mA at 300 K, what will be the error in the value of current in mA?

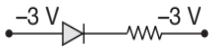
(A) 0.2 mA (B) 0.02 mA
(C) 0.5 mA (D) 0.05 mA

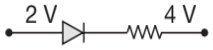
39. [2014]

The forward biased diode connection is

(A) 

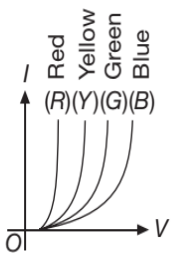
(B) 

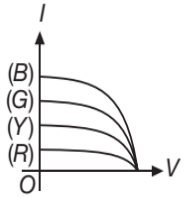
(C) 

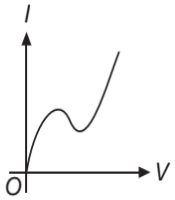
(D) 

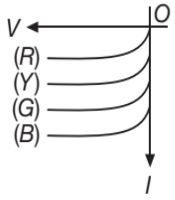
40. [2013]

The I-V characteristic of an LED is

(A) 

(B) 

(C) 

(D) 

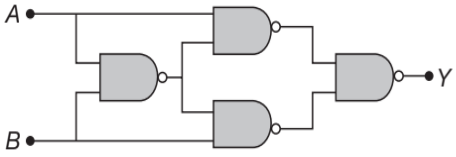
41. [2013]

A diode detector is used to detect an amplitude modulated wave of 60% modulation by using a condenser of capacity 250 pico farad in parallel with a load resistance 100 kilo ohm. Find the maximum modulated frequency which could be detected by it

(A) 10.62 MHz
(B) 10.62 kHz
(C) 5.31 MHz
(D) 5.31 kHz

42. [2012]

Truth table for system of four NAND gates as shown in figure is



(A)

A	B	Y
0	0	0
0	1	0
1	0	1
1	1	1

(B)

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	0

(C)

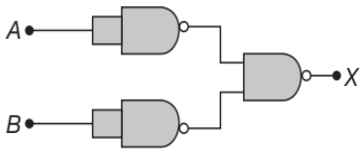
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

(D)

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

43. [2010]

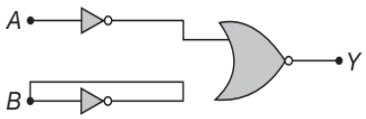
The combination of gates shown below yields

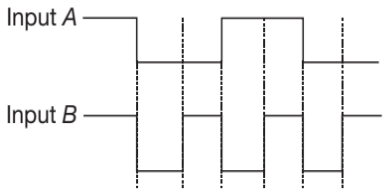


(A) NAND gate
(B) OR gate
(C) NOT gate
(D) XOR gate

44. [2009]

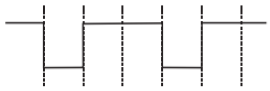
The logic circuit shown below has the input waveforms A and B as shown. Pick out the correct output waveform



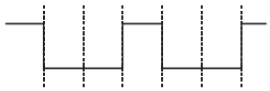


Output is

(A) 

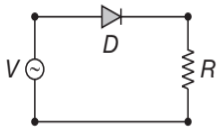
(B) 

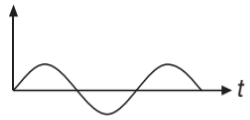
(C) 

(D) 

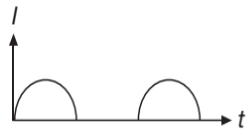
45. **[2009]**

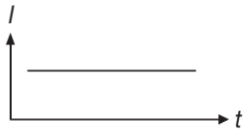
A p-n junction (D) shown in the figure can act as a rectifier. An alternating current source (V) is connected in the circuit. The current (I) in the resistor (R) can be shown by



(A) 

(B) 

(C) 

(D) 

ANSWER KEYS–PRACTICE EXERCISES

Single Correct Choice Type Questions

1. A	2. B	3. C	4. C	5. A	6. B	7. C	8. A	9. D	10. C
11. B	12. B	13. C	14. D	15. C	16. A	17. C	18. D	19. A	20. B
21. A	22. A	23. D	24. D	25. D	26. A	27. C	28. B	29. B	30. D
31. C	32. B	33. B	34. B	35. C	36. C	37. A	38. C	39. C	40. B
41. A	42. C	43. B	44. A	45. B	46. B	47. D	48. C	49. C	50. A
51. A	52. C	53. C	54. D	55. C	56. C	57. A	58. A	59. C	60. D
61. A	62. A	63. A	64. B	65. B	66. B	67. B	68. A	69. C	70. D
71. D	72. A	73. B	74. D	75. B	76. C	77. C	78. B	79. C	80. A
81. A	82. B	83. C	84. B	85. C	86. A	87. B	88. D	89. B	90. C
91. B	92. C	93. D	94. B	95. D	96. B	97. D	98. A	99. C	100. A
101. A	102. D	103. B	104. D	105. D	106. A	107. A	108. D	109. C	110. B
111. D	112. B	113. A	114. D	115. D	116. A	117. B	118. C	119. A	120. B
121. B	122. A	123. B	124. C	125. D	126. B	127. A	128. A	129. B	130. C
131. D	132. C	133. A	134. C	135. C	136. A	137. D	138. A	139. A	140. A
141. A	142. C	143. B	144. A						

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1. C	2. D	3. D	4. A	5. C	6. B	7. D	8. A	9. D	10. C
11. B	12. C	13. B	14. B	15. B	16. B	17. A	18. C	19. B	20. A
21. B	22. D	23. D	24. B	25. B	26. D	27. B	28. A, C	29. B	30. B
31. A	32. B	33. C	34. C	35. C	36. C	37. B	38. A	39. B	40. D
41. B	42. D	43. B	44. A	45. C					