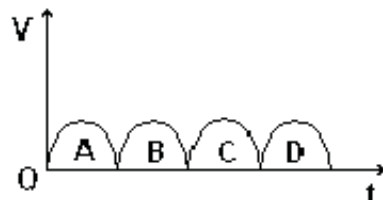
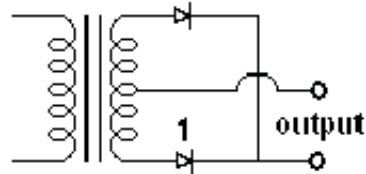
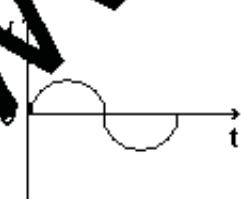


(Answers at the end of all questions)

- 1) In a common base amplifier, the phase difference between the input signal voltage and output voltage is
(a) π (b) $\pi/4$ (c) $\pi/2$ (d) zero [AIEEE 2005]
- 2) In a full wave rectifier, circuit operating from 50 Hz mains frequency, the fundamental frequency in the ripple would be
(a) 25 Hz (b) 50 Hz (c) 70.7 Hz (d) 100 Hz [AIEEE 2005]
- 3) 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 [AIEEE 2004]
- 4) For a transistor amplifier in common emitter configuration for load impedance of $1\text{ K}\Omega$ ($h_{fe} = 50$ and $h_{oe} = 25\ \mu\text{A/V}$), the current gain is
(a) -5.2 (b) -15.7 (c) -24.8 (d) -48.78 [AIEEE 2004]
- 5) A strip of copper and another of germanium are cooled from room temperature to 80 K. The resistance of
(a) each of these increases (b) each of these decreases
(c) copper strip increases and that of germanium decreases
(d) copper strip decreases and that of germanium increases [AIEEE 2004, 2003]
- 6) 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 [AIEEE 2004]
- 7) 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 [AIEEE 2004]
- 8) The difference in the variation of resistance with temperature in a metal and a semiconductor arises essentially due to the difference in
(a) type of bonding (b) crystal structure
(c) scattering mechanism with temperature (d) no. of charge carriers with temp. [AIEEE 2003]
- 9) In the middle of the depletion layer of a reverse biased p-n junction, the
(a) the potential is zero (b) electric field is zero
(c) potential is maximum (d) electric field is maximum [AIEEE 2003]
- 10) In a p-n junction, the depletion layer consists of
(a) electrons (b) protons (c) mobile ions (d) immobile ions [AIEEE 2002]
- 11) In forward bias, the width of potential barrier in p-n junction diode
(a) increases (b) decreases (c) remains constant
(d) first increases, then decreases [AIEEE 2002]

- 12) When a potential difference is applied across, the current passing through,
 (a) an insulator at 0 K is zero
 (b) a semiconductor at 0 K is zero
 (c) a metal at 0 K is finite
 (d) a p-n diode at 300 K is finite if it is reverse biased [IIT 1999]
- 13) A transistor is used in common emitter mode as an amplifier, then
 (a) the base emitter junction is forward biased
 (b) the base emitter junction is reverse biased
 (c) the input signal is connected in series with the voltage applied to bias the base emitter junction
 (d) the input signal is connected in series with the voltage applied to bias the base collector junction [IIT 1998]
- 14) In a p-n junction diode not connected to any circuit
 (a) the potential is the same everywhere
 (b) the p-type side is at a higher potential than the n-type side
 (c) there is an electric field at the junction directed from the n-type side to the p-type side
 (d) there is an electric field at the junction directed from the p-type side to the n-type side [IIT 1998]
- 15) Which of the following statements is not true –
 (a) The resistance of intrinsic semiconductors decreases with increase of temperature
 (b) Doping pure Si with trivalent impurities gives p-type semiconductors.
 (c) The majority carriers in p-type semiconductors are holes
 (d) A p-n junction contact is a semiconductor diode [IIT 1997]
- 16) Holes are charge carriers in
 (a) intrinsic semiconductors (b) ionic solids
 (c) p-type semiconductors (d) metals [IIT 1996]
- 17) A full wave rectifier circuit alongwith the output is shown in the figure. The contribution from the diode 1 is (are)



- (a) C (b) A, C (c) B, D (d) A, B, C, D [IIT 1996]

- 18) 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

- (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

[IIT 1993]

