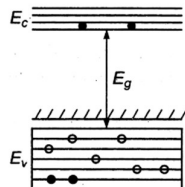


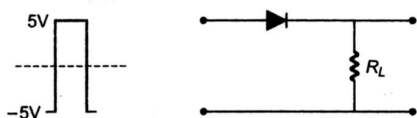
PHYSICS

11. In the energy band diagram of a material shown below, the open circles and filled circles denote holes and electrons respectively. The material is a/an



- (1) p-type semiconductor
- (2) insulator
- (3) metal
- (4) n-type semiconductor

12. 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

- (1)
- (2)
- (3)
- (4)

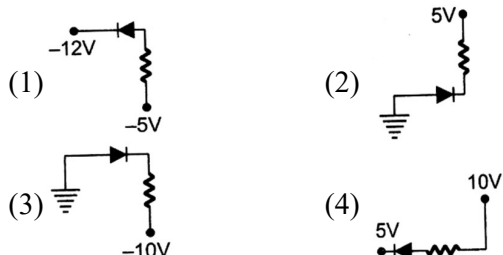
13. In a p-n junction the depletion layer of thickness 10^{-6} m has potential across it is 0.1 V. The electric field is ($V m^{-1}$)

- (1) 10^7
- (2) 10^{-6}
- (3) 10^{+5}
- (4) 10^{-5}

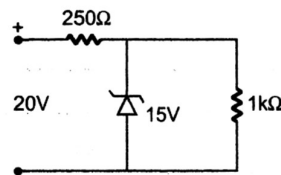
14. If a full-wave rectifier circuit is operating from 50 Hz mains, the fundamental frequency in the ripple will be

- (1) 25 Hz
- (2) 50 Hz
- (3) 70.7 Hz
- (4) 100 Hz

15. In given diagram which p-n junction is reverse biased?

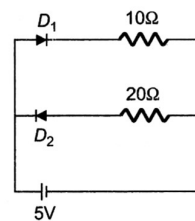


16. A Zener diode, having breakdown voltage equal to 15 used in a voltage regulator circuit shown in the figure current through the diode is



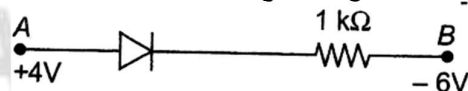
- (1) 5 mA
- (2) 10 mA
- (3) 15 mA
- (4) 20 mA

17. Two ideal diodes are connected to a battery as shown in circuit. The current supplied by the battery is



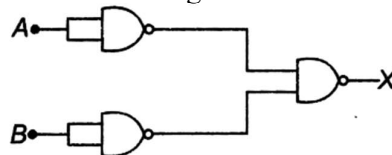
- (1) 0.25 A
- (2) 0.5 A
- (3) 0.75 A
- (4) zero

18. Consider the junction diode as ideal. The value of current flowing through AB is



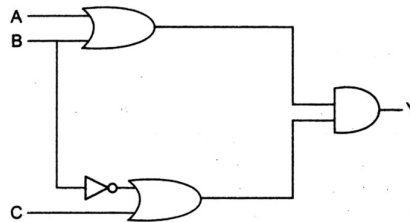
- (1) 0 A
- (2) 10^{-2} A
- (3) 10^{-1} A
- (4) 10^{-3} A

19. The combination of gates shown below yields



- (1) NAND gate
- (2) OR gate
- (3) NOT gate
- (4) XOR gate

20. Find out value of Y



- (1) $(\bar{A} + B) \cdot (\bar{B} + C)$
- (2) $(A + B) \cdot (\bar{B} + C)$
- (3) $(A + \bar{B}) \cdot (B + \bar{C})$
- (4) $(\bar{A} + B) \cdot (\bar{B} + \bar{C})$