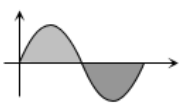
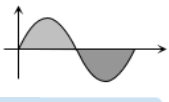
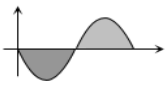
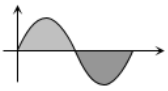
DPP
DAILY PRACTICE PROBLEMS

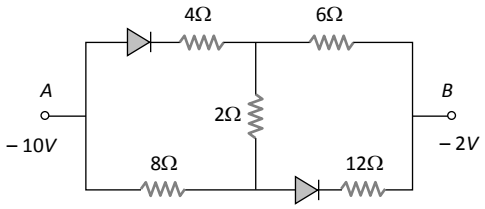
Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 5**

Topic :-.SEMICONDUCTOR ELECTRONICS: MATERIALS,DEVIES AND SIMPLE CIRCUITS

1. A Ge specimen is doped with Al. The concentration of acceptor atoms is $-10^{21}\ atoms/m^3$. Given that the intrinsic concentration of electron hole pairs is $\sim 10^{19}/m^3$, the concentration of electron in the specimen is
   a) $10^{17}/m^3$ b) $10^{15}/m^3$ c) $10^{4}/m^3$ d) $10^{2}/m^3$
2. Atomic packing factor for a face centred cubic cells
   a) $\frac{\pi}{6}$ b) π c) $\frac{\sqrt{3}}{8}\pi$ d) $\frac{\sqrt{2}}{6}\pi$
3. In a cubic unit cell of bcc structure, the lattice points (ie, number of atoms) are
   a) 2 b) 6 c) 8 d) 12
4. Which of the following figures correctly shows the phase relation between the input signal and the output signal of triode amplifier

   a)  b) 
   c)  d) 
5. GaAs (with a band gap $= 1.5\ eV$) as an LED can emit
   a) Blue light b) Green light c) Ultraviolet rays d) Infrared rays
6. The density for simple cubic lattice is (where A is atomic weight, N is Avogadro's number and a is a lattice parameter)
   a) $\frac{4A}{Na^3}$ b) $\frac{2A}{Na^3}$ c) $\frac{A}{Na^3}$ d) $\frac{A}{Na^2}$
7. When germanium is doped with phosphorus, the doped material has
   a) Excess positive charge b) Excess negative charge
   c) More negative current carriers d) More positive current carriers

8. In the following circuit the equivalent resistance between A and B is

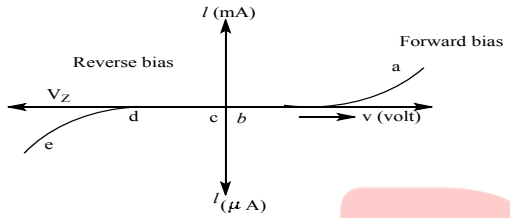


a) $\frac{20}{3}\Omega$ b) 10 Ω c) 16 Ω d) 20 Ω

9. The state of the energy gained by valance electrons when the temperature is raised or when electric field is applied in called as

a) Valance band b) Conduction band c) Forbidden band d) None of these

10. The graph given below represents the I-V characteristics of a zener diode. Which part of the characteristics curve is most relevant for its operation as a voltage regulator?



a) ab b) bc c) cd d) de

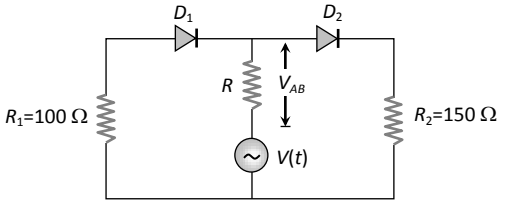
11. The relation between the energy E_f of fermi level, height E_b of potential barrier and work function W_0 is

a) $E_f = W_0 + E_b$ b) $E_b = W_0 - E_f$ c) $E_b = W_0 + E_f$ d) $W_0 = E_b + E_f$

12. The majority charge carriers in P-type semiconductor are

a) Electrons b) Protons c) Holes d) Neutrons

13. In the circuit given below, $V(t)$ is the sinusoidal voltage source, voltage drop $V_{AB}(t)$ across the resistance R is



a) Is half wave rectified
b) Is full wave rectified
c) Has the same peak value in the positive and negative half cycles
d) Has different peak values during positive and negative half cycle

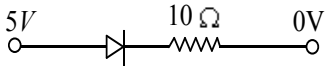
14. Which of these is unipolar transistor

a) Point contact transistor b) Field effect transistor
c) PNP transistor d) None of these

15. Electric conduction in semi-conductor takes place due to

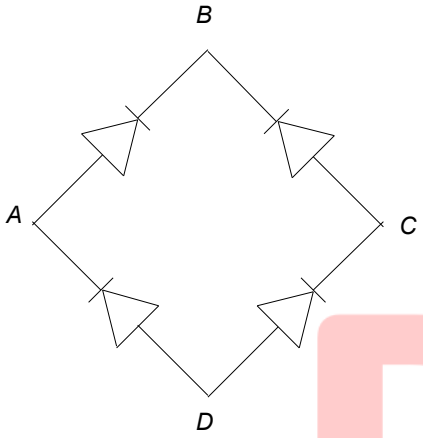
a) Electrons only b) Holes only
c) Both electrons and holes d) None of the above

16. A junction diode has a resistance of 25 Ω when forward biased and 2500 Ω when reverse biased. The current in the diode, for the arrangement shown will be



a) $\frac{1}{15}A$ b) $\frac{1}{7}A$ c) $\frac{1}{25}A$ d) $\frac{1}{480}A$

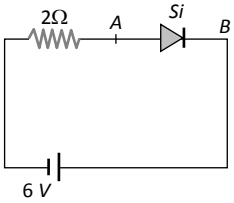
17. In the figure, the input is across the terminals A and C and the output is across B and D. Then the output is



a) Zero b) Same as the input c) Full wave rectified d) Have wave rectified

18. Current gain of a transistor in common base mode is 0.95. Its value in common emitter mode is
a) 0.95 b) 1.5 c) 19 d) $(19)^{-1}$

19. The diode shown in the circuit is a silicon diode. The potential difference between the points A and B will be



a) 6 V b) 0.6 V c) 0.7 V d) 0 V

20. If the output of a logic gate is 0 when all its inputs are at logic 1, then the gate is either
a) NAND or Ex-NOR b) NOR or OR c) Ex-OR or NOR d) AND or NOR