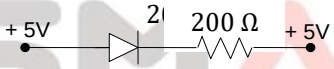
DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 1**

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

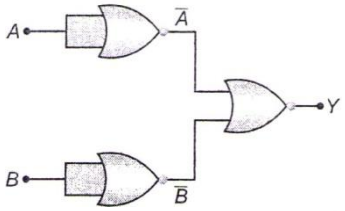
1. The grid in a triode valve is used
   a) To increases the thermionic emission
   b) To control the plate to cathode current
   c) To reduce the inter-electrode capacity
   d) To keep cathode at constant potential
2. A transistor has $\beta = 40$. A charge in base current of 100 μA, produces change in collector current
   a) 40×100 μA b) $(100 - 40)$μA c) $100 + 40$ μA d) $100 \times /40$ μA
3. In a fcc lattice structure, what is the effective number of atoms?
   a) 4 b) 3 c) 2 d) 1
4. The band gap in germanium and silicon in eV respectively is
   a) 0.7, 1.1 b) 1.1, 0.7 c) 1.1, 0 d) 0, 1.1
5. Which circuit will not show current in ammeter

6. The value of current in the following diagram will be



   a) Zero b) 10^{-2} A c) 10 A d) 0.025 A
7. Radiowaves of constant amplitude can be generated with
   a) FET b) Filter c) Rectifier d) Oscillator
8. The plate current in a triode is given by
   $I_p = 0.004\left(V_p + 10V_g\right)^{3/2} mA$
   Where I_p, V_p and V_g are the values of plate current, plate voltage and grid voltage, respectively. What are the triode parameters μ, r_p and g_m for the operating point at $V_p = 120\ volt$ and $V_g = -2\ volt$
   a) 10, 16.7 $k\Omega$, 0.6 $m\ mho$ b) 15, 16.7 $k\Omega$, 0.06 $m\ mho$
   c) 20, 6 $k\Omega$, 16.7 $m\ mho$ d) None of these
9. In $p - n$ junction, the barrier potential offers resistance to
   a) Free electrons in n-region and holes in –region
   b) Free electrons in p-region and holes in n-region
   c) Only free electrons in n-region
   d) Only holes in p-region

10. When the plate voltage of a triode is 150V, its cut-off voltage is -5 V. On increasing the plate voltage to 200 V, the cut-off voltage can be
    a) -4.5 V b) -5.0 V c) -2.3 V d) -6.66 V
11. Resistivity of a semiconductor depends on
    a) Shape of semiconductor
    b) Atomic nature of semiconductor
    c) Length of semiconductor
    d) Shape and atomic nature of semiconductor
12. The valency of the impurity atom that is to be added to germanium crystal so as to make it a N-type semiconductor, is
    a) 6 b) 5 c) 4 d) 3
13. Pure Si at 500 K has equal number of electron (n_e) and hole (n_h) concentrations of $1.5 \times 10^{16} m^{-3}$. Doping by indium increases n_h to $4.5 \times 10^{22} m^{-3}$. The doped semiconductor is of
    a) n −type with electron concentration $n_e = 2.5 \times 10^{23} m^{-3}$
    b) p −type having electron concentration $n_e = 5 \times 10^{9} m^{-3}$
    c) n −type with electron concentration $n_e = 5 \times 10^{22} m^{-3}$
    d) p −type with electron concentration $n_e = 2.5 \times 10^{10} m^{-3}$
14. Identify the operation performed by the circuit given in the figure.



    a) NOT b) AND c) OR d) NAND
15. For germanium crystal, the forbidden energy gap in joules is
    a) 1.12×10^{-19} b) 1.76×10^{-19} c) 1.6×10^{-19} d) Zero
16. Absorption of X-Rays is maximum in which of the following material sheet of same thickness
    a) Cu b) Au c) Be d) Pb
17. Current gain β_{AC} common emitter mode of transistor is
    a) $\beta_{AC} = \left(\frac{\Delta I_C}{\Delta I_B}\right), V_C = \text{constant}$ b) $\beta_{AC} = \left(\frac{\Delta I_B}{\Delta I_C}\right), V_C = \text{constant}$
    c) $\beta_{AC} = \left(\frac{\Delta I_C}{\Delta I_E}\right), V_C = \text{constant}$ d) $\beta_{AC} = \left(\frac{\Delta I_E}{\Delta I_C}\right), V_C = \text{constant}$
18. When boron is added as an impurity to silicon, the resulting material is
    a) n-type semiconductor b) n-type conductor
    c) p-type conductor d) p-type semiconductor
19. Reverse bias applied to a p-n junction diode
    a) Lowers the potential barrier
    b) Decreases the majority charge carries
    c) Raises the potential barrier
    d) Change the mass of p-n junction diode
20. The peak voltage in the output of a half-wave diode rectifier fed with a sinusoidal signal without filter is 10 V. The dc compound of the output voltage is
    a) $10/\sqrt{2}\ V$ b) $10/\pi\ V$ c) $10\ V$ d) $20/\pi\ V$