VITEEE Sample Questions

PHYSICS

1. A rain drop of mass 0.1 g is falling with uniform speed of 10 cm/s. What is the net weight of the drop? [g = 10 m/s^2]

   A) 0 N B) 2×10^{-3} N C) 10^{-2} N D) 10^{-3} N

2. The equation of state corresponding to 8 g of O_2 (assume ideal gas) is

   A) PV = 8RT B) PV = RT/4 C) PV = RT/2 D) PV = RT/8

3. Two very large sheets of plastic are facing each other with a distance 'd' between them. By rubbing them with wool and silk, the sheet on the left gets a uniform surface charge density $n_1 = -n_0$ and the other sheet on the right gets $n_2 = 3n_0$, where $n_0 > 0$. What is the magnitude and direction of the electric field in the region between the two sheets?

   A) n_0/ε_0, left B) n_0/ε_0, right C) $2n_0/\varepsilon_0$, left D) $2n_0/\varepsilon_0$, right

4. The wire in the potentiometer has a resistance of R_0 and the potentiometer is connected to a battery of voltage 'V'. Now a resistor 'R' whose value of resistance has to be measured is connected. When the sliding point is exactly in the middle of the potentiometer, the voltage drop across 'R' is V/4. What is the value of R/R_0?

   A) 1/4 B) 4 C) 2 D) 1/2

5. A charge of 1 C is placed at one end of a non-conducting rod of radius 0.4 m. The rod is rotated in a vertical plane about a horizontal axis passing through the other end of the rod with an angular frequency $2\pi \times 10^4$ rad/sec. The magnetic field at a point on the axis of rotation at a distance 1 m from the center of the path is

   A) 5.75×10^{-5} T B) 6.88×10^{-5} T C) 7.25×10^{-5} T D) 8.08×10^{-5} T

6. In an LCR series circuit, the voltage across each of the components L, C and R is 50 V. The voltage across the LC combination will be

   A) 50 V B) 10 V C) 0 V D) 30 V

7. A convex meniscus lens is made from glass with refractive index n = 1.52. If the radius of curvature of the convex surface is 20 cm and that of the concave surface is 40 cm, then find out the focal length.

   A) 129 cm B) 94 cm C) 80 cm D) 113 cm

8. The work function of cesium is 2.14 eV. The threshold frequency for cesium is

   A) 5.16×10^{14} Hz B) 3.20×10^{14} Hz C) 2.14×10^{14} Hz D) 6.50×10^{14} Hz

9. The half life of radium is 1600 years. After how many years 25% of a radium block will remain undecayed?

   A) 3200 years B) 1500 years C) 2000 years D) 5200 years

10. Intrinsic Si at 300 K has equal 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 value of n_e in the doped Si is

    A) $5.0 \times 10^9\ m^{-3}$ B) $1.0 \times 10^9\ m^{-3}$ C) $8.0 \times 10^9\ m^{-3}$ D) $4.0 \times 10^9\ m^{-3}$