

SECTION – I**2. Write short answers to any EIGHT (8) questions :**

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- (i) What is meant by electric polarization?
- (ii) Prove that electric intensity inside a hollow charged sphere is zero.
- (iii) Electric lines of force never cross each other . Why?
- (iv) How can you identify that which plate of the capacitor is positively charged? Explain it.
- (v) Write down any four uses of CRO.
- (vi) What is Lorentz force? Write down its formula.
- (vii) Why does the picture on the TV screen is distorted when a magnet is brought near its screen?
- (viii) How a galvanometer can be made sensitive?
- (ix) What is the binding energy? Write down the name of element which has highest value.
- (x) Heavy nuclei are unstable. Why?
- (xi) What do you mean by dead time in Geiger-Muller Counter?
- (xii) What factors make a fusion reaction difficult to achieve?

3. Write short answers to any EIGHT (8) questions :

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- (i) Write down four sources of current.
- (ii) Do bends in a wire affect its electrical resistance? Explain.
- (iii) Is the filament resistance lower or higher in a 500 w , 220 volt bulb than in a 100 w , 220 volt bulb?
- (iv) Define the terms peak value and peak to peak value.
- (v) Discuss two uses of three phase A.C. supply.
- (vi) How the reception of a particular radio station is selected on your radio set?
- (vii) Explain ductile substances and brittle substances.
- (viii) What is meant by hysteresis loss?
- (ix) Show that units of modulus of elasticity and stress are the same.
- (x) Why charge carriers are not present in the depletion region?
- (xi) What is the principle of virtual ground?
- (xii) Calculate the gain of a non-inverting amplifier. When $R_1 = \infty$ and $R_2 = 0$

4. Write short answers to any SIX (6) questions :

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- (i) Can a step-up transformer increase the power level? Explain.
- (ii) How would you position a flat loop of a wire in changing magnetic field, so that there is no emf induced in the loop?
- (iii) Write down the factors upon which the mutual inductance depend.
- (iv) Distinguish between A.C. generator and transformer.

(2)

4. (v) Will higher frequency light eject greater number of electrons than low frequency light?
(vi) When does light behave as a wave? When does it behave as particle?
(vii) State Stefan's Boltzman law. Also write the value of Stefan's constant.
(viii) Find the shortest wavelength of radiation in the Balmer series.
(ix) What do we mean when we say that the atom is excited?

SECTION - II

Note : Attempt any THREE questions.

5. (a) State and explain Gauss's law, also calculate the electric intensity due to an infinite sheet of charge. 5
(b) The resistance of an iron wire at 0°C is $1 \times 10^4 \Omega$. What is the resistance at 500°C , if the temperature co-efficient of resistance of iron is $5.2 \times 10^{-3} \text{ K}^{-1}$? 3
6. (a) State Ampere's law and apply it to find magnetic field due to a current carrying solenoid. 5
(b) A solenoid has 250 turns and its self inductance is 2.4 mH. What is the flux through each turn when current is 2 A? What is the induced emf when current changes at 20 As^{-1} ? 3
7. (a) Write a note on transistor as an amplifier. 5
(b) A circuit has an inductance of $\frac{1}{\pi} \text{ H}$ and resistance of 2000Ω . A 50 Hz A.C. is supplied to it. Calculate the reactance and impedance offered by the circuit. 3
8. (a) Define photoelectric effect. Give its explanation on the basis of Quantum theory. 5
(b) A wire 2.5 m long and cross-section area 10^{-5} m^2 is stretched 1.5 mm by a force of 100 N in the elastic region. Calculate Young's modulus. 3
9. (a) What is laser? Write down its properties and also explain laser action in detail. 5
(b) Find the mass defect and binding energy of the deuteron nucleus. The experimental mass of deuteron is $3.3435 \times 10^{-27} \text{ kg}$. 3