Competency Based Questions – Physics Class XII

Section A: Case/Competency Based Questions

1. A scientist is designing a parallel plate capacitor using an insulating material. During testing, it is observed that when the dielectric is inserted, the capacitance increases while the charge remains constant.

(a) What happens to the potential difference across the plates?

(b) Name the physical quantity that remains unchanged.

(c) If the dielectric constant is k, write the new capacitance in terms of original capacitance.

(d) State one practical application of capacitors.

2. An electricity department uses transmission lines at very high voltage.

(a) Why is electrical energy transmitted at high voltage?

(b) How does power loss depend on current?

(c) Name the device used to increase voltage.

(d) Write one limitation of this method.

3. A student performs an experiment with a galvanometer and converts it into an ammeter.

(a) Which resistance is connected to convert galvanometer into ammeter?

(b) Should this resistance be high or low? Why?

(c) State one use of ammeter.

(d) Write the formula for effective resistance.

4. A car uses convex mirrors as rear-view mirrors.

(a) Why are convex mirrors preferred?

(b) What kind of image is formed?

(c) Name one ray diagram rule used.

(d) State one disadvantage of convex mirrors.

5. A coil is rotated in a magnetic field of uniform strength.

(a) Name the phenomenon involved.

(b) Which law explains it?

(c) Write the expression for induced EMF.

(d) State one application of this principle.

Section B: Assertion–Reason Based

6. Assertion (A): Alternating current cannot be stored.

Reason (R): The direction of AC changes periodically.

(a) Both A and R are true and R is the correct explanation.

(b) Both A and R are true but R is not the correct explanation.

(c) A is true but R is false.

(d) A is false but R is true.

7. Assertion (A): Photoelectric effect supports particle nature of light.

Reason (R): Emission of electrons depends on intensity of light alone.

Options as above.

Section C: Data Based / Analytical

8. A wire of length 1 m and cross section area A has resistance R.

(a) How will resistance change if length is doubled?

(b) What happens if area is halved?

(c) State the relation between resistance and temperature.