Short Answer type questions

- 1) What is the dimension formula for $\frac{1}{4\pi\varepsilon_0}$?
- a) $ML^3T^{-4}A^{-2}$
- b) $ML^3T^{-2}A^{-2}$
- c) $ML^2T^{-4}A^{-2}$
- d) $ML^3T^{-1}A^{-2}$

Ans (a)

- 2. X,Y,Z are three charged bodies . X and Y repel each other And X attracts Z. What is the nature of force between B and C?
- a) Attractive
- b) Repulsive

Ans (a)

- 3. On going away from point charge ,the electric field due to charge decreases . This is also true for small electric dipole. Does the electric field decreases at the same rate?
- a) Yes
- b) No

Ans (b)

The field due to electric charge decrease more rapidly as Electric Field for electric dipole

$$E\alpha \frac{1}{r^3}$$

Electric Field due to charge

$$E\alpha \frac{1}{r^2}$$

4. Match the column

| Materials | Carrier of electric current |
|---------------------------|-----------------------------|
| Metallic rod | Electrons and protons |
| Semiconductor | Positive and negative ions |
| Super conductor | Electrons and holes |
| A hydrogen discharge tube | Electron pairs |
| An electrolytic cell | Free electrons |

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Ans

Metallic rod -> Free electrons
Semiconductor -> electrons and holes
Super conductor -> Electrons pairs
A hydrogen discharge tube -> electrons and protons
An electrolytic cell -> Positive and negative ions

Question

In the expression,

F=q vXB

Which of the following pairs are at right angle always

- a) F and v
- b) F and B
- c) v and B
- d) None of the above

Ans (a) and (b)

Question

What are the dimensions of $1/\sqrt{\mu_0 \varepsilon_0}$?

- a) LT-1
- b) LT⁻²
- c) LT⁻¹A
- d) None of the above

Ans (a)

Question

Which off these particles can be accelerated in a cyclotron

- a) Protons
- b) electrons
- c) neutrons
- d) None of the above

Ans (a) and (b)

Question:

Which of the following statements are true?

STATEMENT I-> The energy in charged capacitor resides in the electric field between the plates of the capacitor

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STATEMENT II-> The values L/R,CR and \sqrt{LC} have same dimensional formula's STATEMENT III-> The resistance in LCR circuit is responsible for dying the electric oscillations in the ciurcuit

STATEMENT IV->The current rises to steady value at a constant rate in a LR circuit

Ans (a) (b) and (c)

Question:

Which of the following rays are electromagnetic waves

- a) Cathode rays
- b) X-rays
- c) y rays
- d) Positive rays
- e) β rays

Ans (b) and (c)