



XI-SCI : Physics
Electrostatics,

DATE:

TIME: 1 hour 30
minutes

MARKS: 25

SEAT NO:

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Note:-

1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

Section A

Q.1 Select and Write the correct answer.

(4)

1. Which of the following is NOT true about dielectric constant?
A) It has no units B) It depends on temperature and nature of medium
C) It is always constant D) both (a) and (b)
2. Intensity of an electric field E due to a dipole, depends on distance ' r ' as
A) $E \propto \frac{1}{r^4}$ B) $E \propto \frac{1}{r^3}$
C) $E \propto \frac{1}{r^2}$ D) $E \propto \frac{1}{r}$
3. In H-atom, the distance between electron and proton is 5.3×10^{-11} m The electrical force of attraction between them will be
A) 12.2×10^{-8} N B) 8.2×10^{-8} N
C) 9.6×10^{-8} N D) 6.3×10^{-8} N
4. A charge q_1 exerts some force on a second charge q_2 . If third charge q_3 is brought near charge q_1 , the force of q_1 exerted on q_2
A) Decreases B) Increases
C) Remains unchanged D) Increases if q_3 is of the same sign as q_1 and decreases if q_3 is of opposite sign

Q.2 Answer the following.

(3)

1. What is the magnitude charge on an electron?
2. Define : Electric Charge.
3. Define : Conservation of Charge

Section B

Attempt any Four

- Q.3 A thick chain hangs from a petrol or a diesel tanker and it is in contact with ground when the tanker is moving. **(2)**
- Q.4 Explain elementary particles why atom is neutral. **(2)**
- Q.5 State the SI unit and dimension of permittivity of free space (ϵ_0). **(2)**

- Q.6 The surface charge density of Earth is $\sigma = 1.33 \text{ n C/m}^2$. That is about 8.3×10^9 electrons per square meter. If that is the case why don't we feel it? (2)
- Q.7 Two parallel plates have a potential difference of 10 V between them. If the plates are 0.5 mm apart, what will be the strength of electric charge? (2)
- Q.8 Calculate the electric field due to a charge of $-8.0 \times 10^{-8} \text{ C}$ at a distance of 5.0 cm from it. (2)

Section C
Attempt any Two

- Q.9 State characteristics of electric lines of forces. (3)
- Q.10 Explain principle of superposition. (3)
- Q.11 Calculate the total charge of electron in 180 g of water. (3)

Section D
Attempt any One

- Q.12 Define Electric field Intensity and state its SI unit and dimensions. (4)
- Two charge $5\mu\text{ C}$ and $-4\mu\text{ C}$ are kept 5.0 m apart at points A and B respectively. How much work will have to be done to move the charge at A through a distance of 5.0 m further away from point B along the line BA?
- Q.13 Explain charge density and types of charge density. (4)