UNIT 1 ELECTROSTATICS PRACTICE SHEET – 1

1. AXIAL LINE:

Diagram:

Explanation:

$\vec{E}_+$ = $\vec{E}_-$ =

By Superposition principle, $\vec{E}_{total}$ =

$\vec{E}_{total}$ = $\vec{p}$

2. EQUATORIAL LINE:

Diagram: Explanation:

$\vec{E}_{total}$ =

$|\vec{E}_+| = |\vec{E}_-| =$

cos θ =

$\vec{E}_{total}$ = $\vec{p}$ =

3. POTENTIAL AT A POINT DUE TO DIPOLE:

Diagram: Explanation:

V_1 = V_2 =

V = V =

Δ BOP, Cosine law $\frac{1}{r_1} =$

Δ AOP, Cosine law $\frac{1}{r_2} =$

V = p =

4. GAUSS LAW: INFINITELY LONG CHARGED LINE WIRE:

Gauss law : Φ_E =

Diagram:

Φ_E =

E. =

E = $\vec{E}$ =

UNIT 1 ELECTROSTATICS PRACTICE SHEET - 2

5. GAUSS LAW: SPHERICAL SHELL:

Gauss law : Φ_E =

At a point outside the shell: $\vec{E}$ =

At a point on the shell: $\vec{E}$ =

At a point inside the shell: $\vec{E}$ =

6. CAPACITOR FILLED WITH DIELECTRIC: BATTERY DISCONNECTED:

1. Charge: Q =

2. Voltage: V =

3. Electric field: E =

4. Capacitance: C =

5. Energy: U =

7. CAPACITORS IN SERIES

1. - same
   - differs

2. V =

3. V =

4. If C_s is the
   then, V =

5. $\frac{1}{C_S}$ =

CAPACITORS IN PARALLEL

1. – same
   - differs

2. Q =

3. Q =

4. If C_P is the
   then, Q =

5. C_P =

8. VAN DE GRAAFF GENERATOR:

Produces an electrostatic potential difference =

Principle: 1. 2.

Diagram: Explanation:

WORKING:

Near the comb D: Due to

Charges are repelled towards the and

Charges are attracted towards the

Near the comb E: Due to

Charges are induced in the comb E

Charges are distributed on the

Prevention of leakage: filled chamber at a high

Use: To accelerate charged ( )

for the purpose of disintegration.

READ ALL THE BOOKBACK ONE WORD QUESTIONS AND ANSWERS

*** Coulomb's law in electrostatics: F =

Electrostatic force is directly proportional to the and

Inversely proportional to the of the between the charges.

Gravitational force is directly proportional to the and

Inversely proportional to the of the between them.

Electrostatic force depends on the of the

Gravitational force does not depend on the

UNIT 2 CURRENT ELECTRICITY PRACTICE SHEET – 1

1. OHM'S LAW – MICROSCOPIC FORM

Diagram: Explanation:

V_d = dQ =

I = J = =

$\vec{J}$ = $\vec{J}$ = σ is

2. OHM'S LAW - MACROSCOPIC FORM

Diagram: Explanation:

E = J = =

Also J =

V = ( ) = where R = and is called

3. INTERNAL RESISTANCE OF A CELL – VOLTMETER

Open circuit: reading gives of the cell.

Closed circuit: Potential difference across is equal to the potential difference across the

V =

ε – V =

1 / 2, r =

4. RESISTORS IN SERIES

1. – same

   - differs

2. V =

3. V =

4. If R_S is the

   then, V =

5. R_S =

RESISTORS IN PARALLEL

1. - same

   - differs

2. I =

3. I =

4. 4. If R_P is the

   then, I =

5. $\frac{1}{R_P}$ =

5. METER BRIDGE:

Diagram:

FORMULA: Unknown resistance:

$\frac{P}{Q}$ = = $\frac{P}{Q}$ =

P =

Specific resistance: ρ =

UNIT 2 CURRENT ELECTRICITY PRACTICE SHEET – 2

6. WHEATSTONE'S BRIDGE:

Diagram: Explanation:

KCR: Junction B:

Junction D:

KVR: ABDA:

ABCDA:

= 0

I_1 P =

I_3 Q =

Bridge balance condition:

7. COMPARISON OF EMF: POTENTIOMETER

Diagram:

Primary circuit:

Secondary circuit:

$\varepsilon_1 =$

$\varepsilon_2 =$

$\frac{\varepsilon_1}{\varepsilon_2} =$

8. INTERNAL RESISTANCE OF A CELL: POTENTIOMETER

Diagram:

ε α → 1

$\frac{\varepsilon R}{R+r}$ α → 2

1 / 2

r = R (