RIZWAN ACADEMY – KASUR

ELECTROSTATICS + CURRENT ELECTRICITY

Name: _____ **Roll No: (in words)** _____

OBJECTIVE TYPE

Total Marks: 12   **Paper Code: _____**   **Total Time: 10 Minutes**

NOTE: Write your **Roll No.** in space provided. Using lead pencil will result in loss of marks.

Q.No.1: You have four choices for each objective type question as A,B,C and D. The choice which you think is correct; fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

Sr. No.	QUESTION	A	B	C	D
1.	Value of dielectric constant $\in_r$ for water is	**25**	**2.1**	**3.40**	**78.5**
2.	When area is neither perpendicular nor parallel to the field lines, then electric flux is	EA Cos θ	EA Sin θ	$\vec{E} \bullet \vec{A}$	Both (A) and (C)
3.	The existence of human body is attached with	Electric force	Gravitational force	Nuclear force	None of these
4.	The expression for the radius of the droplet falling under the action of gravity is	$\sqrt{\dfrac{9\eta v}{2\rho g}}$	$\sqrt{\dfrac{\eta v}{2\rho g}}$	$\sqrt{\dfrac{2\eta v}{9\rho g}}$	None of these
5.	If a charge is moved against the electric field, it will gain	Potential energy	Kinetic energy	Mechanical energy	Electric potential energy
6.	Electric force as compared to gravitational force is	Very weak	Very strong	Zero	Infinite
7.	The electric current may cause due to	Electrons	Negative ions	Positive ions	All of these
8.	The working principle of electroplating is	Potentiometer	Electrolysis	Wheatstone bridge	None of these
9.	Whenever current is drawn from a cell, its terminal potential difference and EMF become	Different	Same	Zero	Negative
10.	Convention for a current flowing towards a point is	Positive	Negative	Zero	None of these
11.	A thermocouple converts	Electrical energy into solar energy	Heat energy into electrical energy	Mechanical energy into electrical energy	None of these
12.	The proportionality constant between current and potential difference is	P	R	$1/R$	V

SUBJECTIVE TYPE

Total Marks:18   **Time Allowed: 0 Hours 50 Minutes**

SECTION – I (SHORT QUESTIONS)

2. Attempt any FIVE questions.   **(5×2=10)Marks**

   i. The potential is constant throughout a given region of space. Is the electrical field zero or non-zero in this region? Explain.

   ii. Describe the force or forces on a positive point charge when placed between parallel plates.

   (A)   With opposite and equal charges.   (B)   With similar and equal charges.

   iii. If a point charge q of mass m is released in a non-uniform electric field with field lines parallel to each other, will it make a rectilinear motion?

   iv. Is $\vec{E}$ necessarily zero inside a charge rubber balloon if balloon is spherical? Assume that charge is distributed uniformly over the surface.

   v. Describe a circuit which will give a continuously varying potential.

   vi. What are the difficulties in testing whether the filament of a light bulb obeys Ohm's law?

   vii. Why does the resistance of a conductor rise with temperature?

SECTION – II   (ESSAY TYPE) Attempt given question

   3. Do as directed...

   i. What is meant by a capacitor and its capacitance? Find an expression for the capacitance of parallel plate capacitor.   (5)

   ii. In Millikan's experiment, oil droplets are introduced into the space between two flat horizontal plates, $500mm$ apart. The plate voltage is adjusted to exactly $780V$ so that the droplet is held stationary. The plate voltage is switched off t and he selected droplet is observed to fall a measured distance of $1\bullet50mm$ in $11\bullet2s$. Given that the density of the oil used is $900\,kg\bullet m^{-3}$, and the viscosity of air at laboratory temperature is $1\bullet80\times10^{-5}N\bullet m^{-2}\bullet s.$, calculate: (a) the mass, and (b) the charge on the droplet. (assume $g = 9\bullet8m\bullet s^{-2}$)   (3)

SECTION – III (Practical)

4.   **(a)** Write answer of TWO questions.   **(2×2=4)**

   i.   a
   ii.   c
   iii. v
   iv.   b

4.   **(b)** Write procedure to determine the resistance of voltmeter by graph method.   (3)

(OR)

Write procedure to find the unknown high resistance by using neon flash lamp.   (3)

4.   **(c)** Answer the following questions on the basis of graph drawn between potential difference (V) **and charge** (Q).   (4)

   i.   What you conclude from the graph?
   ii.   Find the capacitance of capacitor from the graph.

Good Luck
Ch. Khalid Mahmood Ashraf