B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

MID-APRIL TEST 2025-26

PHYSICS

Class: XII **Time: 1hr**
Date: 19.04.25 **Max Marks: 25**
Admission no: **Roll no:**

General Instructions:

i. *There are three sections A, B, and C with 12 questions in total, Section A has 3 Multiple Choice Questions of one mark each, Section B has 5 questions of two marks each and Section C has 4 questions of three marks each.*
ii. *All questions are compulsory.*
iii. *Calculators are not allowed.*

Section A

1. V/m is the unit of _____. 1
   (a) Electric field intensity (b) Electric flux (c) Electric potential (d) Charge
2. The electric potential on the axis of an electric dipole at a distance 'r from its centre is V. Then the potential at a point at the same distance on its equatorial line will be…. 1
   (a) 2V (b) -V (c) V/2 (d) Zero
3. The work done in moving a unit positive test charge over a closed path in an electric field is _____. 1

   (a) Always 1 (b) Infinite (c) Zero (d) Negative

Section B

4. State and explain conservation of charge. 2
5. What is an equipotential surface? Write its two important properties. 2
6. Two charges 3Q and -Q are located 4 cm apart. At what point on the line joining the two charges is the electric field zero? 2
7. Two charges -q and + q are located at points A (0, 0, – a) and B (0, 0, +a) respectively. How much work is done in moving a test charge from point P (7, 0, 0) to Q (-3, 0, 0)? 2
8. What will the force between two small spheres that have 2 X 10^{-7} C and 3 X 10^{-7}C be, if they are suspended in the air and have 30 cm of distance between them? 2

Section C

9. An electric dipole of length 2 cm is placed with its axis making an angle of 60^0 to a uniform electric field of 10^5 N/C. If it experience a torque of $8\sqrt{3}$ Nm, calculate the
   (i) Magnitude of the charge on the dipole, and
   (ii) Potential energy of the dipole. (1.5+1.5)
10. What are parallel plate capacitor? Derive expression for its capacitance. What will be change in its capacitance if a dielectric material of dielectric constant K inserted between the plates? 3
11. State Coulomb's law of electrostatic force. Derive an expression of force experienced by a point charge due to another point charge in vector form. 3
12. State and explain Gauss' law. Using Gauss' law find the electric field intensity due to uniformly charged hollow spherical shell. 3

----------BEST OF LUCK----------