O P JINDAL SCHOOL, SAVITRINAGAR

PRACTICE PAPER

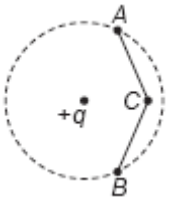
CLASS XII PHYSICS **TOPIS : Electric potential and Capacitance**

Date : 8/04/20 **MM :20**

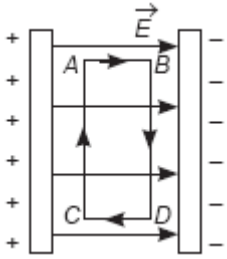
---

1 What is the work done in moving a test charge q through a distance of 1 cm along the equatorial axis of an electric dipole? 1

2 If a point charge $+q$ is taken first from A to C and then from C to B of a circle drawn with another point charge $+q$ at centre, then along which path more work will be done? 1



3 A uniform electric field E exists between two charged plates as shown in figure. What would be the work done in moving a charge q along the closed rectangular path $ABCDA$? 1



4 What is the geometrical shape of equipotential surfaces due to a single isolated charge? 1

5 Why is there no work done in moving a charge from one point to another on an equipotential surface? 1

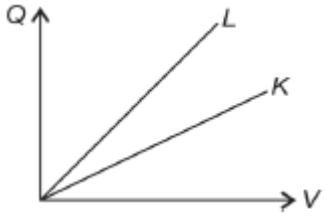
6 Can two equipotential surfaces intersect each other? Justify your answer. 1

7 In the expression $W = pE(\cos\theta_0 - \cos\theta_1)$, why is θ_0 is taken as $\pi/2$ for obtaining expression for the potential energy of electric dipole? 1

8 A hollow metal sphere of radius 5 cm is charged such that the potential on its surface is 10 V. What is the potential at the centre of the 1

sphere?

9 The following graph shows the variation of charge Q, with voltage V, for two capacitors K and L. In which capacitor is more electrostatic energy stored? 1



10 A 500 μC charge is at the centre of a square of side 10 cm. Find the work done in moving a charge of 10 μC between two diagonally opposite points on the square. 1

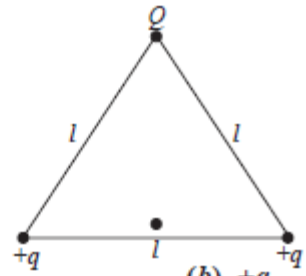
11 Equipotentials at a great distance from a collection of charges whose total sum is not zero are approximately. 1
(a) spheres (b) planes
(c) paraboloids (d) ellipsoids

12 If a unit positive charge is taken from one point to another over an equipotential surface, then 1
(a) work is done on the charge.
(b) work is done by the charge.
(c) work done is constant.
(d) no work is done.

13 A conductor with a positive charge 1
(a) is always at +ve potential.
(b) is always at zero potential.
(c) is always at negative potential.
(d) may be at +ve, zero or –ve potential.

14 A parallel plate condenser is connected with the terminals of a battery. The distance between the plates is 6mm. If a glass plate (dielectric constant K = 9) of 4.5 mm is introduced between them, then the capacity will become 1
(a) 2 times. (b) the same.
(c) 3 times. (d) 4 times.

15 Three charges Q, +q and +q are placed at the vertices of an equilateral triangle of side l as shown in the figure. If the net electrostatic energy 1

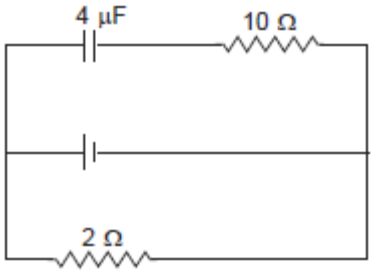


of the system is zero, then Q is equal to

(a) $-q$ (b) $+q$

(c) zero (d) $-\frac{q}{2}$

16 A capacitor of 4 μF is connected as shown in the circuit. The internal resistance of the battery is 0.5 Ω. The amount of charge on the capacitor plates will be



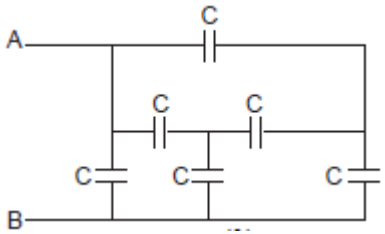
(a) 0 (b) 4 μC (c) 16 μC (d) 8 μC 1

17 If E is the electric field intensity of an electrostatic field, then the electrostatic energy density is proportional to

(a) E (b) E^2

(c) $1/E^2$ (d) E^3 1

18 Find the equivalent capacitance of the system across the terminals A and B. All the capacitors have equal capacitances.



(a) 2 C (b) 4 C

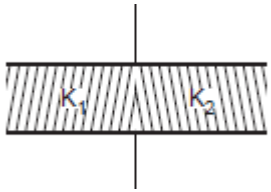
(c) 3 C (d) 5 C 1

19 The capacitors of capacitance 4 F, 6 F and 12 F are connected first in series and then in parallel. What is the ratio of equivalent capacitance in the two cases?

(a) 2 : 3 (b) 11 : 1

(c) 1 : 11 (d) 1 : 3 1

20 A parallel plate capacitor with air as medium between the plates has a capacitance of 10 μF. The area of capacitor is divided into two equal halves and filled with two media having dielectric constant $k_1 = 2$ and $k_2 = 4$ as shown in the figure. The capacitance of the system will now



be (a) 10 μF (b) 20 μF
(c) 30 μF (d) 40 μF

N.B.-This sheet is prepared from home.