INDIAN SCHOOL MUSCAT

SECOND PERIODIC ASSESSMENT

PHYSICS

042

CLASS: XII **MAX.MARKS: 20**

DATE:06-05-2021 **TIME ALLOWED: 40 MINUTES**

INSTRUCTIONS:

1.All questions are compulsory.

2.This question paper has three sections: Section A, Section B and Section C.

3. **Section A** has Case based questions of 5 marks, **Section B** contains three short answer questions of 2 marks each and **Section C** contains three short answer questions of 3 marks each

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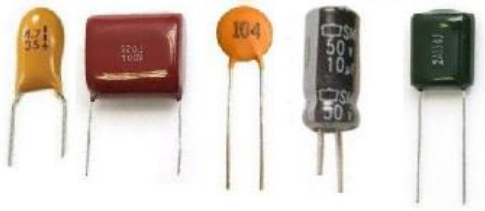
SECTION A

Capacitor

A capacitor is a device that stores electrical energy. It consists of conductors of any shape and size carrying charges of equal magnitudes and opposite signs and separated by an insulating medium. The parallel plate capacitor consists of two metal plates parallel to each other and separated by a distance that is very small as compared to the dimensions of the plates.



1 Dielectric constant for a metal is. 1

(a) zero
(b) infinite
(c) 100
(d) 10

2 SI unit of capacitance is. 1

(a) J
(b) V/m
(c) C/V
(d) V m

3 If the distance between the plates of parallel plate capacitor is halved and the dielectric constant is doubled, then its capacity will. 1

(a) increase by 2 times
(b) increase by 4 times
(c) increase by 16 times
(d) remains the same.

4 Three capacitors each of capacitance 10 pF are connected in series. What is the potential difference across each capacitor if the combination is connected to a 210 V supply? 1

(a) 210 V
(b) 100 V
(c) 40 V
(d) 70 V

5 A parallel plate capacitor C has a charge Q. The actual charges on its plates are 1

(a) Q, -Q
(b) Q, Q
(c) Q/2 , Q/2
(d) Q/2 , - Q/2

SECTION B

6 Can electric potential at a point be zero while the electric field is not zero? If so, give an example. 2

7 Draw three equipotential surfaces corresponding to a uniform electric field in the X direction. 2

8 No work is done in moving a charge over an equipotential surface. Why? 2

SECTION C

9 Define dipole moment. Obtain an expression for the electric potential along the axial line of an electric dipole. 3

10 A parallel plate capacitor each with plate area A and separation d is charged by a battery. After some time, the battery is disconnected. A dielectric slab of dielectric constant K is now placed between the plates. What change if any will take place in. 3

(i)charge on plates

(ii)capacitance of the capacitor

(iii)electric field intensity between the plates

Justify your answer in each case.

11 **(a)** Sketch a graph to show how charge Q given to a capacitor C varies with the potential difference. 3

(b) Two-point charges +10μC and -10μC are separated by a distance of 40 cm in air. Calculate the electrostatic potential energy of the system, assuming the zero of the potential energy to be at infinity.

End of the question paper