FMM

FIRST MID TERM TEST - 2022

12 - Std

PHYSICS

Reg. No. 1 2 0 1 0 0 6

Time : 1.30 Hrs

Marks : 35

PART - A

Note : 1) Answer all questions. 2) Choose the correct answer and write it with option. 10 X 1 = 10

1. Which charge configuration produces a uniform electric field?
   a) Point charge b) uniformly charged infinite wire
   c) uniformly charged infinite plane d) uniformly charged spherical shell
2. Parallel plate capacitor stores a charge Q at a voltage V. Suppose the area of the parallel plate capacitor and the distance between the plates are each doubled then which is the quantity that will change?
   a) capacitance b) charge c) voltage d) energy density
3. The capacitance of a capacitor is ..... .
   a) directly proportional to the charge q given to it
   b) Inversely proportional to its potential V
   c) directly proportional to the charge q and inversely proportional to the potential V.
   d) independent of both the charge q and potential v.
4. The electric field inside the two opposite charged plane sheets each of charge density σ is
   a) $\sigma/2\varepsilon_0$ b) $-\sigma/2\varepsilon_0$ c) σ/ε_0 d) zero
5. A semiconductor with a negative temperature coefficient of resistivity is called as ..... .
   a) conductor b) superconductor c) thermistor d) insulators
6. The internal resistance of a 2.1V cell which gives a current of 0.2A through a resistance of 10Ω is
   a) 0.2Ω b) 0.5Ω c) 0.8Ω d) 1.0Ω
7. Two wires of A and B with circular cross section are made up of the same material with equal length. Suppose $R_A = 3R_B$, then what is the ratio of radius of wire A too that of B?
   a) 3 b) $\sqrt{3}$ c) $1/\sqrt{3}$ d) 1/3
8. In Joule's heating law, when R and t are constant, if the H is taken along the y axis and I^2 along the x axis, the graph is
   a) straight line b) parabola c) circle d) ellipse

9. The vertical component of Earth's magnetic field at a place is equal to the horizontal component. What is the value of angle of dip at this place?
a) 30° b) 45° c) 60° d) 90°

10. If the geometrical length of the magnet is 12cm then the magnetic length of uniform bar magnet
a) 10m b) 10cm c) 24cm d) 6cm

PART - B

3 X 2 = 6

Answer any three questions and Question No. 13 is compulsory.

11. Write down Coulomb's law in vector form and mention what each term represents.
12. The electric field lines never intersect. Why?
13. The temperature coefficient of resistance of a wire is 0.00125 per °C. At 20°C, its resistance is 1Ω. Find the temperature at which the resistance of the wire will be 2Ω.
14. What is Seebeck effect?
15. What is polar molecules?

PART - C

Answer any three questions and question No. 18 is compulsory.

16. List the properties of electric field lines. 3 X 3 = 9
17. Derive the expression for resultant capacitance, when capacitors are connected in series.
18. In a meter bridge experiment, the value of resistance in the resistance box connected in the right gap is 10Ω. The balancing length is l_1 = 55 cm. Find the value of unknown resistance.
19. State Kirchhoff's first rule, second rule.
20. Write the properties of ferro magnetic materials.

PART - D

Answer all questions. 2 X 5 = 10

21. Explain in detail the construction and working of Van de Graff generator.

(OR)

Derive an expression for electrostatic potential due to electric dipole and also discuss it various aspects.

22. Obtain the condition for bridge balance in Wheatstone's bridge.

(OR)

Explain the determination of internal resistance a cell using potentiometer.