



Date: 16-06-2022

Dept. No.

Max. : 100Marks

Time: 01:00-04:00

PART – A

Q. No. Answer ALL the questions (10 x 2 = 20 Marks)

- 1 Define electric dipole and dipole moment.
- 2 What is electric flux? Give its unit.
- 3 Calculate the capacitance of earth, viewed as a spherical conductor of radius 6370 km.
- 4 What is dielectric? Give some examples.
- 5 State Ampere's circuital law.
- 6 Find the magnetic induction at a point, 10 cm from a long straight wire carrying a current of 10A.
- 7 State Faraday's I and II law.
- 8 Define one Henry.
- 9 Write any four characteristics of EM wave.
- 10 What is meant by displacement current?

PART – B

Answer any FOUR questions (4 x 7.5 = 30 Marks)

- 11 State and prove Gauss's law in electrostatics.
- 12 Derive the relation between D, E and P.
- 13 What is toroid? Apply Ampere's circuital law to find the magnetic field at any point (i) on (ii) inside and (iii) outside the toroid.
- 14 What is Gyromagnetic ratio? Explain it.
- 15 What is meant by self-induction? Derive an expression for the self-inductance of a long solenoids.
- 16 Deduce the equation for the propagation of the plane electromagnetic waves in free space.

PART – C

Answer any FOUR questions (4 x 12.5 = 50 Marks)

- 17 Derive electric field and potential due to an electric dipole. Also discuss the special cases.
- 18 Describe the construction and theory of Helmholtz galvanometer. Mention its merits.
- 19 What is dielectric breakdown? Discuss its types.
State Biot-Savart Law. Derive an expression for magnetic induction at a point due to an infinite straight conductor carrying current
- 20
- 21 Discuss the motion of a charged particle in crossed electric and magnetic fields.
- 22 Derive all the four Maxwell's equations.

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