UNIT 1

5 MARKS

1. Calculate the electric field due to a dipole on its axial line and equatorial plane (page 23, 24, 25)

2. Derive an expression for electrostatic potential due to an electric dipole (page 30, 31, 32)

3. Obtain the expression for electric field due to an infinitely long charged wire (page 43, 44)

4. Explain in detail the construction and working of a Van de Graff generator (page 68, 69)

5. Derive the expression for resultant capacitance when capacitors are connected in series and in parallel (page 62, 63, 64)

3 Marks

1. Derive an expression for electrostatic potential due to a point charge (page 28)

2. Derive an expression for torque experienced by a dipole due to a uniform electric field (page 25, 26)

3. Obtain the expression for capacitance for a parallel plate capacitor (page 56, 57)

4. Discuss the basic properties of electric charges (page 3, 4)

5. Obtain the expression for energy stored in the parallel plate capacitor (page 58)

6. Obtain Gauss law from Coulomb's law (Page 40, 41)

7. Explain in detail the effect of a dielectric placed in a parallel plate capacitor (page 59, 60, 61)

8. Obtain the expression for electric field due to an uniformly charged spherical shell (page 46, 47)

UNIT 2

3 MARKS & 5 MARKS

1. State and explain Kirchhoff's rules (page 107, 108)

2. Obtain the condition for bridge balance in Wheatstone's bridge (page 109, 110)

3. Explain the determination of the internal resistance of a cell using voltmeter (page 103, 104)

4. How the e.m.f. of two cells are compared using potentiometer? (page 113, 114)

5. Explain the equivalent resistance of a series and parallel resistor network (page 92, 93)

6. Describe the microscopic model of current and obtain general form of Ohm's law (page 87, 88, 89)

UNIT 3

5 MARKS

1. Deduce the relation for the magnetic induction at a point due to an infinitely long straight conductor carrying current (page 164, 165)

2. Discuss the working of Cyclotron in detail (page 181, 182, 183)

3. Obtain a relation for force on a current carrying conductor placed in a magnetic field (page 183, 184)

4. Obtain a relation for force between two long parallel current carrying conductors and also define unit of current (page 185, 186)

5. Obtain a relation for the magnetic induction at a point along the axis of a circular coil carrying current (page 166, 167)

3 MARKS

1. Discuss the conversion of galvanometer into an ammeter and also a voltmeter (page 193, 194, 195)

2. Discuss the difference between soft and hard ferromagnetic materials (page 158)

3. Write similarities and difference between Coulomb's law and Biot-Savart law (page 163)

4. Obtain an expression for magnetic field due to a long current carrying solenoid (page 171, 172)

5. Write special features of Lorentz force (page 175)

6. Compare dia, para and ferro magnetism (page 152, 153, 154)

7. Find the magnetic induction due to a long straight conductor using Ampere's circuital law (page 169, 170)

UNIT 4

5 MARKS

1. Explain the working of a single-phase A.C. generator with a necessary diagram (page 240, 241, 242)

2. Show that the Mutual inductance between a pair of coils is same ($M_{12} = M_{21}$) (page 230, 231)

3. Derive an expression for phase angle between the applied voltage and current in a series RLC circuit (page 260, 261)

4. Show mathematically that the rotation of a coil in a magnetic field over one rotation induces an alternating e.m.f. of one cycle (page 234, 235, 236)

5. Explain the principle, construction and working of a transformer (page 243, 244, 245)

6. Find out the phase relationship between voltage and current in a pure inductive circuit (page 255, 256)

7. Find out the phase relationship between voltage and current in a pure capacitive circuit (page 256, 257)

8. Elaborate the standard construction details of A.C. generator (page 237, 238, 239)

3 MARKS

1. Assuming that the length of the solenoid is large when compared to its diameter, find the equation for its inductance (page 227)

2. Mention the various energy losses in a transformer (page 245)

3. Give the uses of Foucault current (page 223, 224, 225)

4. How will you induce an e.m.f. by changing the area enclosed by the coil? (page 233, 234)

5. Show that the total energy is conserved during LC oscillations (page 269)

6. Obtain an expression for motional e.m.f. from Lorentz force (page 217, 218)

7. write advantages and disadvantages of A.C. over D.C. (page 266)

8. Obtain an expression for average power of A.C. over a cycle. Discuss its special cases (page 264, 265)

UNIT 5

5 MARKS & 3 MARKS

1. What is spectrum? Explain the types of spectra. (page 295, 296)

2. Explain the Maxwell's modification of Ampere's circuital law (page 284, 285, 286)

3. Write down Maxwell equations in integral form (page 287, 288)

4. Write down the properties of electro magnetic waves (page 289, 290, 291)

5. Discuss the source of electromagnetic waves (page 291, 292)

6. Discuss briefly the experiment conducted by Hertz to produce and detect electro magnetic spectrum (page 288, 289)