(NO. OF PAGES: 2)

(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2023-24 ONLY)

SUBJECT CODE 23 UPS 405

REG.NO.

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : MAY– 2025

B.Sc. – PHYSICS **MAXIMUM MARKS: 75**

IV SEMESTER **TIME : 3 HOURS**

PART – III
ELECTRICITY AND MAGNETISM

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

1. S.I. Unit of Potential difference is…….

   a) Volt b) Ampere c) Weber d) Meter

2. If a dielectric is placed between the plates of capacitor, then the capacitance of the capacitor ……

   a) Decrases b) Increases c) No change d) None of these

3. In Lorentz force equation, F = ____

   a) E b) q(E+ v x B) c) q d) E + v x B

4. S.I. Unit of self-inductance is _____

   a) Farad b) Volt c) Henry d) Ampere

5. In Coulomb Gauze, the divergence of vector potential is ……..

   a) ∞ b) 1 c) 0 d) 2

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. (K2)

6. Define electric field
7. Define Capacitance of the conductor
8. List the condition for a moving coil galvanometer to be dead beat
9. Differentiate self inductance and mutual inductance
10. Find the values of B, J and D related to electric and magnetic fields.

(CONTD …. 2)

ETHICAL PAPER

SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K3)

11. a) Examine the equipotential surface.

(OR)

b) Show that $\nabla^2 V = -\rho/\varepsilon_0$

12. a) Describe the principle of capacitor

(OR)

b) Interpret the mechanism of polarization

13. a) Describe the Torque on a current loop in a uniform magnetic field

(OR)

b) Compare the emf of two cells using Ballistic galvanometer

14. a) Discover self-inductance of the long solenoid

(OR)

b) Describe the mutual inductance of the two coils.

15. a) Outline the poynting theorem

(OR)

b) Summarise the displacement current

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K4/K5)

16. a) Develop the relationship between the electric field (E) and electric potential (V).

(OR)

b) Evaluate the potential and field due to uniformly charged disc.

17. a) Determine the capacitance of the spherical capacitor.

(OR)

b) Analyse the electric polarization vector (P). Formulate the relation between D, E and P.

18. a) Develop Ampere's circuital law. Determine magnetic induction due to toroid using it.

(OR)

b) Discuss the magnetic induction at any point on the axis of a solenoid.

19. a) Analyse the Faraday's induction law. Compute vector form of it.

(OR)

b) Discuss the discharge of the capacitor through inductor and resistor

20. a) Develop the Maxwell's equations.

(OR)

b) Discuss the propagation of electro magnetic waves in free space.