**Reg. No.** | | | | | | | | |

**G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.**

**UG DEGREE END SEMESTER EXAMINATIONS - APRIL 2025.**

(For those admitted in June 2021 and later)

**PROGRAMME AND BRANCH: B.Sc. PHYSICS**

| SEM | CATEGORY | COMPONENT | COURSE CODE | COURSE TITLE |
|---|---|---|---|---|
| IV | PART –III | CORE | U21PH406 | ELECTROMAGNETISM |

**Date & Session:24.04.2025/AN** **Time : 3 hours** **Maximum: 75 Marks**

| Course Outcome | Bloom's K-level | Q. No. | **SECTION – A (10 X 1 = 10 Marks)**<br>**Answer ALL Questions.** |
|---|---|---|---|
| CO1 | K1 | 1. | The unit of self-induction is_____.<br>a) Ohm b) henry<br>c) per henry d) seimen |
| CO1 | K2 | 2. | The law of electromagnetic induction was given by ___.<br>a) Faraday b) Lenz<br>c) Fleming d) Ampere |
| CO2 | K1 | 3. | The unit of Magnetic flus is _____.<br>a) ampere b) weber<br>c) maxwell d) volt |
| CO2 | K2 | 4. | The differential form of Ampere's law is_____.<br>a) $\nabla.E=0$ b) $\nabla xB=\mu_0 J$<br>c) $\nabla.B=0$ d) $\nabla xB=0$ |
| CO3 | K1 | 5. | Magnetic induction is_____.<br>a) flux per unit area b) total normal flux<br>c) dipole moment per unit volume d) none of the above |
| CO3 | K2 | 6. | Magnetic susceptibility *k* is defined as_____.<br>a) H/M b) M/H<br>c) B/H d) H/B |
| CO4 | K1 | 7. | Electromagnetic waves are _____in nature.<br>a) longitudinal b) transverse<br>c) both (a) & (b) d) none of these |
| CO4 | K2 | 8. | Brewster angle is the angle of _____.<br>a) incidence b) reflection<br>c) refraction d) transmission |
| CO5 | K1 | 9. | Earth inductor works on the Principal of _____.<br>a) X-ray production b) mechanical advantage<br>c) magnetic hysteresis d) electromagnetic induction |
| CO5 | K2 | 10. | Search coil has _____.<br>a) a few number of turns b) a large number of coils<br>c) an ivory frame d) a short handle |

| Course Outcome | Bloom's K-level | Q. No. | **SECTION – B (5 X 5 = 25 Marks)**<br>**Answer ALL Questions choosing either (a) or (b)** |
|---|---|---|---|
| CO1 | K3 | 11a. | Explain the Faraday's law and Lenz's laws of electromagnetic induction.<br>**(OR)** |
| CO1 | K3 | 11b. | Define self-inductance. Derive an expression for self-inductance of a long solenoid. |
| CO2 | K3 | 12a. | Explain Bio Savart's law.<br>**(OR)** |
| CO2 | K3 | 12b. | Obtain an expression for torque on a current loop in a uniform magnetic field. |
| CO3 | K4 | 13a. | Examine the relation connecting three magnetic vectors B, H and M.<br>**(OR)** |
| CO3 | K4 | 13b. | Illustrate Magnetic Permeability and Magnetic Susceptibility. Derive the relation connection them. |
| CO4 | K4 | 14a. | Investigate the physical significance of Maxwell's equation.<br>**(OR)** |
| CO4 | K4 | 14b. | What are the characteristic of displacement current? |
| CO5 | K5 | 15a. | List out the application of induction coil.<br>**(OR)** |
| CO5 | K5 | 15b. | Discuss the calibration of B.G using Earth inductor. |

| Course Outcome | Bloom's K-level | Q. No. | **SECTION – C (5 X 8 = 40 Marks)**<br>**Answer ALL Questions choosing either (a) or (b)** |
|---|---|---|---|
| CO1 | K3 | 16a. | Describe, with relevant theory, Rayleigh's method of determining Self Inductance of a coil.<br>**(OR)** |
| CO1 | K3 | 16b. | Determine the Self Inductance of a coil using Anderson Method. |
| CO2 | K4 | 17a. | Find an expression for magnetic induction at any point on the axis of a long solenoid.<br>**(OR)** |
| CO2 | K4 | 17b. | With a neat sketch, explain the theory of moving coil ballistic Galvanometer. |
| CO3 | K4 | 18a. | Discuss about the properties of Dia, Para and Ferro magnetic materials.<br>**(OR)** |
| CO3 | K4 | 18b. | Illustrate the ballistic method to determine B-H curve. |
| CO4 | K5 | 19a. | Deduce the Maxwell's equation for free space.<br>**(OR)** |
| CO4 | K5 | 19b. | Deduce the velocity of plane electromagnetic waves in free space by applying Maxwell's equation. |
| CO5 | K5 | 20a. | Discuss the measurement of a strong magnetic field using a search coil and B.G.<br>**(OR)** |
| CO5 | K5 | 20b. | Discuss the experimental determination of horizontal component of earth's magnetic field. |