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

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

UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2024.

(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:11.11.2024/AN **Time : 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	SECTION – A (10 X 1 = 10 Marks) Answer ALL Questions
CO1	K1	1.	The SI unit of Self Inductance is _____. a) Tesla b) Ohm c) ampere d) Henry
CO1	K2	2.	The direction of the induced e.m.f in a circuit is given by _____. a) Faraday's law b) Fleming's rule c) Lenz's law d) Lorentz's rule
CO2	K1	3.	Ballistic galvanometer is used to measure _____. a) steady current b) large current c) electric charge d) deflection
CO2	K2	4.	Ampere's circuital law can be written as _____. a) $\mu_o I_o$ b) $\int B.d = \mu_o I_o$ c) $\int B.d = \mu I$ d) $\int B.d = 0$
CO3	K1	5.	Write down the unit of magnetization (M). a) Fm^{-1} b) Am^{-1} c) μm d) Cm^{-1}
CO3	K2	6.	Ferromagnetic materials or Ferrites are obtained from _____. a) copper b) zinc c) iron d) aluminium
CO4	K1	7.	The idea of displacement current was first developed by _____. a) Ampere b) Faraday c) Gauss d) Maxwell
CO4	K2	8.	In an electromagnetic field, the energy density at a point is directly proportional to _____. a) E b) E^2 c) I/E d) E^3
CO5	K1	9.	The inductors store _____. a) electrostatic energy b) magnetic energy c) potential energy d) heat energy
CO5	K2	10.	An induction coil works on the principle of _____. a) self induction b) mutual induction c) Ampere's rule d) Fleming right hand rule

Course Outcome	Bloom's K-level	Q. No.	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	11a.	Explain the faraday's law of electromagnetic induction. **(OR)**
CO1	K3	11b.	Derive an expression for self-inductance of a long solenoid.
CO2	K3	12a.	Explain how charge sensitiveness of a capacitor is determined using a ballistic galvanometer. **(OR)**
CO2	K3	12b.	Derive an expression for magnetic induction at any point on the axis of a solenoid.
CO3	K4	13a.	Distinguish between dia, para and ferromagnetic materials. **(OR)**
CO3	K4	13b.	Explain the relation between the three magnetic vectors B, H and M.
CO4	K4	14a.	Obtain an expression for poynting vector in electromagnetic field. **(OR)**
CO4	K4	14b.	Derive an expression for plane electromagnetic waves in free space.
CO5	K5	15a.	Explain earth inductor with a neat diagram. **(OR)**
CO5	K5	15b.	Describe an induction coil and explain its action.

Course Outcome	Bloom's K-level	Q. No.	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	16a.	Describe Anderson's bridge method of determining the self- inductance of a coil of wire. **(OR)**
CO1	K3	16b.	Give the method of determining the mutual inductance between two coils of wire with relevant theory.
CO2	K4	17a.	Explain the principle, construction and theory of moving coil ballistic galvanometer. **(OR)**
CO2	K4	17b.	Obtain an expression for magnetic induction at a point due to a straight conductor carrying current.
CO3	K4	18a.	Give an account of Langevin's theory of diamagnetism. **(OR)**
CO3	K4	18b.	Describe with necessary theory, an experiment to draw B-H curve.
CO4	K5	19a.	Derive Maxwell's equations and give the generalized forms of Maxewell's equation. **(OR)**
CO4	K5	19b.	Obtain the wave equations for the electric field in a conducting medium from Maxwell's equations.
CO5	K5	20a.	Describe how the earth inductor can be used to determine the earth's horizontal and vertical field induction B_H & B_V at a place. **(OR)**
CO5	K5	20b.	Explain how will you determine the ballistic constant K of a ballistic galvanometer using solenoid inductor.