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
III	PART- III	CORE	U21PH305	ELECTRICITY

Date & Session: 05.11.2024/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 electric field is. a) $N\,C^{-1}$ b) NC c) N d) $N\,C^{-1}\,m^{-1}$
CO1	K2	2.	According to Gauss theorem. a) $\varphi = \frac{\epsilon_0}{q}$ b) $\varphi = \frac{q}{\epsilon_0}$ c) $\varphi = q\,\epsilon_0$ d) $\varphi = \frac{2q}{\epsilon_0}$
CO2	K1	3.	The electric potential is a. a) vector b) scalar c) both (a) and (b) d) zero
CO2	K2	4.	One microfarad is equal to. a) 10^{-5} F b) 10^{-7} F c) 10^{6} F d) 10^{-6} F
CO3	K1	5.	Thermocouple works on. a) Peltier effect b) Kelvin effect c) Thomson effect d) Seebeck effect
CO3	K2	6.	Which of the following does not conduct electricity? a) sugar solution b) vinegar solution c) lemon juice solution d) caustic soda solution
CO4	K1	7.	A current of 5A is drawn by a filament of an electric bulb for 2 min. Find the amount of electric charge that flows through the circuit a) 300 C b) 450 C c) 600 C d) 100 C
CO4	K2	8.	The following circuit will not produce any transient? a) R L circuit b) RLC circuit c) Linear circuit d) pure resistive circuit
CO5	K1	9.	Inductive reactance is equal to? a) $1/\omega L$ b) ω/L c) ωL d) L/ω
CO5	K2	10.	The power factor is one for which of the following? a) Pure capacitor b) Pure inductor c) Pure resistor d) All of the above
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.	Determine the potential energy of a dipole in a uniform electric field. **(OR)**
CO1	K3	11b.	State and explain the differential form of Gauss's Law.

CO2	K3	12a.	Determine the electric potential due to point charge. **(OR)**
CO2	K3	12b.	Derive an expression for the energy stored by a charged capacitor.
CO3	K4	13a.	Explain how the Peltier effect is different from the Joule hearting effect. **(OR)**
CO3	K4	13b.	Define Electrolyte. Obtain an expression for electrical conductivity of an Electrolyte.
CO4	K4	14a.	State Kirchoff's Current law and voltage law. **(OR)**
CO4	K4	14b.	Explain the decay of current in a circuit containing L and R.
CO5	K5	15a.	Define root mean square value of an alternating current. **(OR)**
CO5	K5	15b.	Comparison between series and parallel resonant circuits.

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.	State and explain Coulomb's Law. **(OR)**
CO1	K3	16b.	Use Gauss's law to calculate the electric field due to a uniformly charged sphere i) Inside ii) Outside iii) On the sphere.
CO2	K4	17a.	Determine the potential at a point due to a uniformly charged conducting sphere. **(OR)**
CO2	K4	17b.	Explain the principle of a capacitor. Derive an expression for the capacity of a parallel plate capacitor.
CO3	K4	18a.	Explain the uses of thermoelectric diagram in detail. **(OR)**
CO3	K4	18b.	Determination of specific heat conductivity of electrolytes using Kohlrausch Bridge method.
CO4	K5	19a.	Discuss the conversion of galvanometer into an ammeter and a voltmeter. **(OR)**
CO4	K5	19b.	Derive an expression for the growth of charge in L C R circuit. also obtain the frequency oscillation.
CO5	K5	20a.	Derive an expression for the impedance of an LCR series circuit and obtain the resonant frequency of the circuit. **(OR)**
CO5	K5	20b.	Obtain the expression for the power in an AC circuit containing R, L and C.