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

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

UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2024.

(For those admitted in June 2023 and later)

PROGRAMME AND BRANCH: B.Sc., MATHEMATICS

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
I	PART - III	ELECTIVE GENERIC - I	U23PH1A1	ALLIED PHYSICS I

Date & Session: 14.11.2024/FN **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.	If the length of the Sonometer wire was halved, the resonance frequency will become _____ a) same b) three times c) four times d) double
CO1	K2	2.	The frequency of ultrasonic waves are _____. a) above 20 Hz b) below 20 kHz c) above 20 kHz d) 20 – 20 KHz
CO2	K1	3.	The unit for Young's modulus of the material of the beam _____. a) N/m b) N/m^2 c) m/s^2 d) Nm
CO2	K2	4.	When the moment of inertia of the torsion pendulum increases then the time period of oscillation _____. a) Decreases b) Increases c) No change d) First increases and then decreases
CO3	K1	5.	The second law of thermodynamics implies_____. a) whole of the heat can be converted into mechanical energy b) no heat engine can be 100% efficient c) every heat engine has an efficiency of 100% d) a refrigerator can reduce the temperature to absolute zero.
CO3	K2	6.	In Porous-plug experiment the change in temperature of a gas depends upon _____. a) its molecular weight b) its specific heat **c)** pressure gradient on either side d) its heat capacity
CO4	K1	7.	In an A.C. circuit, root mean square and maximum value of current are related as _____. a) $I_{rms} = \frac{I_0}{\pi}$ b) $I_{rms} = \frac{I_0}{\sqrt{2}}$ c) $I_{rms} = \sqrt{2}\ .I_0$ d) $I_{rms} = \Pi\ I_0$
CO4	K2	8.	_____ is the ratio of true power to the apparent power. a) Average Power b) Power factor c) Virtual power d) Null power
CO5	K1	9.	The logic gate which gives the high output only when both the inputs are high is _____. a) NOT b) OR c) AND d) EX-OR
CO5	K2	10.	In Boolean equations, the OR operation is performed by which properties? a) Associative b) Commutative c) Distributive d) Absorption
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 laws of transverse vibrations of stretched strings. **(OR)**
CO1	K3	11b.	Write the applications of ultrasonic waves.

CO2	K3	12a.	Find an expression for bending moment of a beam. **(OR)**
CO2	K3	12b.	Determine the Young's modulus by non-uniform bending with neat diagram.
CO3	K4	13a.	Illustrate liquefaction of air by Linde's process. **(OR)**
CO3	K4	13b.	Examine First law of thermodynamics.
CO4	K4	14a.	Analyse the power factor and current values in an A.C circuit. **(OR)**
CO4	K4	14b.	Examine Biot-Savart law.
CO5	K5	15a.	Assess the De Morgan's theorem. **(OR)**
CO5	K5	15b.	Evaluate (i) Y = A+B and (ii) Y=A.B with logic symbol, circuit diagram and truth table.

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.	Find the composition of two simple harmonic motions at right angles. **(OR)**
CO1	K3	16b.	Determine the AC frequency of the tuning fork using sonometer.
CO2	K4	17a.	Examine Poiseuilli's formula to determine the viscosity of the liquid. **(OR)**
CO2	K4	17b.	Analyse the rigidity modulus of the material of the wire using torsional pendulum.
CO3	K4	18a.	Illustrate Carnot's cycle and obtain an expression for the efficiency of an ideal heat engine. **(OR)**
CO3	K4	18b.	Examine Joule-Thomson porous plug experiment with neat diagram.
CO4	K5	19a.	How to measure the thermo e.m.f using potentiometer? **(OR)**
CO4	K5	19b.	Evaluate the peak, average and r.m.s value of an A.C. current and voltage.
CO5	K5	20a.	NOR and NAND gates are called as universal building blocks - Justify. **(OR)**
CO5	K5	20b.	Evaluate (i) Y = $\overline{A}$ (ii) Y = $\overline{A+B}$ and (ii) Y=A.B with logic symbol, circuit diagram and truth table.