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., PHYSICS

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
I	PART - III	CORE-1	U23PH101	PROPERTIES OF MATTER AND ACOUSTICS

Date & Session: 09.11.2024/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.	The ratio of normal stress to longitudinal strain is _____. a) modulus of rigidity b) bulk modulus c) young's modulus d) Poisson's ratio
CO1	K2	2.	When an external force acts on a body, there is change in its length, shape and volume. The body is said to be _____. a) deformed b) compressed c) strained d) stressed
CO2	K1	3.	A _____ is a thin uniform bar fixed horizontally at one end and loaded at the other end. a) beam b) lever c) cantilever d) cantilever
CO2	K2	4.	If a beam is subjected to pure bending, then the deformation of the beam forms _____. a) arc of a circle b) triangular c) trapezoidal d) rectangular
CO3	K1	5.	The unit of co-efficient of viscosity is _____. a) NSM^{-2} b) NSM^{-3} c) NSM d) NSM^{-1}
CO3	K2	6.	Raindrops are spherical in shape because of _____. a) capillary action b) downward motion c) surface tension d) acceleration due to gravity
CO4	K1	7.	The maximum displacement of a vibrating particle is called _____. a) velocity b) amplitude c) frequency d) wavelength
CO4	K2	8.	Lissajou's figures are used for measuring _____. a) current b) frequency c) voltage d) resistance
CO5	K1	9.	The distance travelled by sound waves in one time period is _____. a) amplitude b) velocity c) intensity d) wavelength
CO5	K2	10.	The velocity of sound is maximum _____. a) air b) liquid c) gases d) solid
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 stress-strain diagram with neat sketch. **(OR)**
CO1	K3	11b.	Show that E = $\frac{9GK}{3K+G}$.

CO2	K3	12a.	Find an expression for the depression at the loaded end of the cantilever. **(OR)**
CO2	K3	12b.	A bar of length 1 m, breadth 0.02 m and thickness 0.005 m is supported at its two ends and loaded in the middle. For a load of 0.4 Kg, the depression at the centre is 2×10^{-3} m. Calculate the Young's modulus of the material of the bar.
CO3	K4	13a.	Infer the concept behind variation of surface tension with temperature. **(OR)**
CO3	K4	13b.	Compare streamline and turbulent flow.
CO4	K4	14a.	Calculate the frequency of the fundamental mode of a string 1 m long weighing 2 g loaded with 40 g in Melde's string experiment (longitudinal mode). **(OR)**
CO4	K4	14b.	Illustrate the Melde's string experiment to determine the frequency of an electrically maintained tuning fork.
CO5	K5	15a.	Evaluate the acoustic intensity at a point in terms of pressure amplitude. **(OR)**
CO5	K5	15b.	Show the requisites for good acoustics.

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.	Obtain an expression for the total work done in stretching a wire. **(OR)**
CO1	K3	16b.	Using torsion pendulum, explain how you would determine the rigidity modulus of a wire.
CO2	K4	17a.	Analyze the concept of elevation hence find the Young's modulus of the bar by uniform bending using pin and microscope method. **(OR)**
CO2	K4	17b.	Calculate the Young's modulus by Koenig's method using scale and telescope arrangement.
CO3	K4	18a.	Illustrate Poiseuille's formula for the rate of flow of a liquid through a capillary tube; hence find the Coefficient of viscosity of a liquid. **(OR)**
CO3	K4	18b.	Water flows through a horizontal tube of length 0.2 metre and internal radius 8.1×10^{-4} metre under a constant head of the liquid 0.2 metre high. In 12 minutes 8.64×10^{-4} m^3 of liquid issues from the tube. Calculate the coefficient of viscosity of water. (The density of water = 1000 Kg m^{-3} and g = 9.81 ms^{-2}).
CO4	K5	19a.	Discuss the composition of two simple harmonic motion of equal periods in a straight line. **(OR)**
CO4	K5	19b.	Show how the sharpness of resonance depends upon the damping factor.
CO5	K5	20a.	Assess the concept of reverberation time and also shows how the energy density decays with time. **(OR)**
CO5	K5	20b.	What is piezoelectric effect? Make use of inverse piezoelectric effect how would produce ultrasonic waves?