Register Number:……..

KUMARAGURU
college of technology
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B.E/B.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Second Semester

COMMON TO AUTO / CIVIL / ECE / IT / ISE / MECH / MCE

U18PHI2202**:** Engineering Physics

COURSE OUTCOMES

CO1: Enhance the fundamental knowledge in properties of matter and its real time applications relevant to various streams of Engineering and Technology.
CO2: Understand the phenomenon of heat and its transfer mechanism in engineering systems.
CO3: Acquire essential knowledge in the concepts of quantum mechanics and its impact on electron microscopy.
CO4: Analyse the concept of lasers, optical fibres, and their importance in diverse fields of engineering.
CO5: Apply the principles of acoustic and ultrasonic techniques for engineering practice.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	State Hooke's law.	CO1	[K_1]
2.	Mention the role of I shape girders in the construction of bridges.	CO1	[K_1]
3.	Define coefficient of thermal conductivity and mention its unit.	CO2	[K_1]
4.	State the working principle of microwave oven.	CO2	[K_1]
5.	List any two physical significances of wave function.	CO3	[K_1]
6.	Rewrite the advantages of scanning electron microscope.	CO3	[K_1]
7.	Compare spontaneous emission and stimulated emission.	CO4	[K_2]
8.	Calculate the numerical aperture of an optical fiber cable with a cladding refractive index of 1.378 and a core refractive index of 1.546.	CO4	[K_2]
9.	Mention the relation between the loudness of sound to intensity of the sound waves.	CO5	[K_1]
10.	List any two properties of ultrasonic waves.	CO5	[K_1]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Interpret with necessary theory, the determination of Young's modulus of elasticity of the material of a beam supported at its ends and loaded in the middle.	10	CO1	[K_2]
	b)	Explain the various regions present in the stress-strain diagram and mention its uses.	6	CO1	[K_2]
12.	a)	Explain Lee's disc method for determining the thermal conductivity of bad conducting materials.	10	CO2	[K_2]
	b)	Illustrate the working principle, construction and working of a microwave oven.	6	CO2	[K_2]
13.	a)	Describe the experimental verification of Compton effect.	6	CO3	[K_2]
	b)	Derive the Schroedinger wave equation for a particle in an one dimensional box and obtain the energy eigen values.	10	CO3	[K_2]
14.	a)	Explain the construction and working of semiconductor laser with necessary diagrams.	10	CO4	[K_2]
	b)	Compare step index fiber with graded index fiber.	6	CO4	[K_2]
15.	a)	Explain Principle, the construction and working of Piezoelectric Oscillator in the production of ultrasonic waves.	12	CO4	[K_2]
	b)	Classify the nature of thermal insulation materials in Heat flow applications.	4	CO2	[K_2]
16.	a)	Arrive an expression for reverberation time of an auditorium using Sabine's formula.	10	CO5	[K_2]
	b)	Summarize the factors affecting the acoustics of the buildings and their remedies.	6	CO5	[K_2]

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