R18 Regulation *Subject code: 2B1AB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech I Semester Supplementary Examinations, June 2024

ENGINEERING PHYSICS

(Common to CE & ME)

Maximum Marks: 70 Date:27.06.2024 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

	All the following questions carry equal marks 10X2M=20Marks	Blooms Tx	CO
1.	Define vector and scalar quantities with examples.	L1	CO1
2.	State an explain the D' Alembert's principle	L2	CO1
3.	What is the simple harmonic motion.	L1	CO2
4.	What is a damped harmonic oscillator.	L1	CO2
5.	What is a transverse wave?	L1	CO3
6.	Define acoustic waves and standing sound waves.	L1	CO3
7.	What are coherent sources.	L1	CO3
8.	Define diffraction.	L2	CO3
9.	Write the components of laser.	L2	CO3
10.	Write about the structure of optical fibre.	L2	CO4

Part-B

	Answer all the following questions 5X10M=50Marks		
11.	Derive the equation of motion in polar co- ordinates? [10]	L3	CO1
	OR		
12.	Describe the transformation of scalars and vectors under rotation? [10]	L2	CO2
13.	What is an electrical harmonic oscillator? Obtain an expression the Frequency of oscillators. [10]	L3	CO2
	OR		
14.	(a) Obtain the generalized equation for a damped harmonic oscillator. [5] (b) Write the conditions of light, heavy, critical damping for damped harmonic oscillator? [5]	L3 L2	CO2 CO2

15.	(a) Obtain the equation for the velocity of a transverse wave in a stretched string. [7] (b) Calculate the speed of transverse waves in a wire of $1mm^2$ cross-section under the tension produced by 0.1kg weight (specific gravity of material of wire $=9.81\ gm/cm^3$ and $g=9.81m/s^2$) [3]	L3 L2	CO3 CO3
	OR		
16.	(a) Derive the plane acoustic equation and show that the velocity of sound wave in gas is $V = \sqrt{(\frac{\gamma P}{\rho_0})}$. [7] (b) The fundamental frequency of a sonometer wire increases by 5 Hz if its tension is increased by 21%. How will the frequency be affected if its length is increased by 10%? [3]	L3	CO3
17.	(a) Explain the formation of Newton's rings. [5] (b) Describe the construction and working of a Mach Zehnder Interferometer? [5]	L3 L3	CO3 CO3
	OR		
18.	Derive equation of Fraunhoffer diffraction due to N- slit. [10]	L3	CO3
19.	(a) With the help of suitable diagram, Explain the construction and working of He –Ne laser. [5] (b) Write the characteristics of laser. [5]	L3 L3	CO3 CO3
	OR		
20.	(a) Distinguish between light propagation in step index optical fiber and graded Index optical fiber. [5] (b) Describe the basic elements of a fiber optics communication system with the help of block diagram. [5]	L3 L2	CO4 CO4