R18 Regulation *Subject code: 2B1AF*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, June 2024

PHYSICS-I

(Common to EEE,ECE,CSE & IT)

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.	What is coherence? Explain it.	L1	CO1
2.	Derive an equation for the refractive index of a given liquid from Newton's rings experiment	L2	CO1
3.	Why the Newton's rings are circular?	L2	CO1
4.	State Brewster's law.	L1	CO1
5.	State Malus law.	L2	CO2
6.	Write the components of LASER?	L1	CO2
7.	Define spontaneous emission and stimulated emission	L1	CO2
8.	Define numerical aperture of a fibre.	L1	CO2
9.	An electron is confined to one dimensional potential box of length $2A^0$ Calculate the energies corresponding to 2^{nd} & 4^{th} quantum states in ev	L3	CO3
10.	Write a short notes on photo electric effect.	L1	CO3

Part-B

Answer all the following questions 5X10M=50Marks			
11.	(a) Explain the phenomenon of interference of light and derive an equation for path difference in the case of reflected light. [7m] (b) A parallel beam of light $\lambda = 5890A^0$ is incident on a glass plate. Show that angle of refraction into the glass plate is 60^0, calculate the smallest thickness of the plate which will make it appear dark by reflection. [3m]	L2 L3	CO1 CO1
	OR		
12.	(a) Explain the construction and working of Michelson interferometer. [7m] (b) Write the applications of interference. [3m]	L2 L3	CO1 CO1
13.	(a) Describe the experiment to determine wavelength using a plane transmission grating. [7m] (b) Monochromatic light of wavelength 6.56×10^{-7}m falls normally on a grating 2cm wide. The first order spectrum is produced at an angle of $18^0\ 15^1$ from The normal. Deduce the total number of lines on the grating. [3m]	L2 L3	CO1 CO1
	OR		
14.	(a) Explain the concept of double refraction. [7m] (b) Discuss the construction of Nicol's prism. [3m]	L2 L2	CO1 CO1

15.	(a) Describe and explain semiconductor laser. [5m] (b) Write the application of laser in medicine & industries. [5m]	L1 L2	CO2 CO2
	OR		
16.	(a) Explain population inversion. [3m] (b) Describe the construction & working of ruby laser. [7m]	L2 L2	CO2 CO2
17.	(a) Define acceptance angle and Derive an equation for acceptance angle. [7m] (b) The N.A of an optical fibre is 0.39. If the difference in the refractive indices of the material of its core and cladding is 0.05, calculate the refractive index of material of the core. [3m]	L1 L3	CO2 CO2
	OR		
18.	(a) Explain the optical fibres in communication system with neat diagram? [5m] (b) Write a short note on various losses in optical fibres. [5m]	L2 L1	CO2 CO3
19.	Derive an expression for the Max Planck's black body radiation energy distribution. [10m]	L2	CO3
	OR		
20.	(a) What is de Broglie's hypothesis? Derive an equation of de Broglie wave length of an electron? [7m] (b) Calculate the velocity and kinetic energy of an electron of wavelength 1.66×10^{-10}m. [3m]	L1 L3	CO3 CO3