



R18 Regulation

Subject code:2B1AF

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, January 2024

PHYSICS-I

(Common to EEE,ECE,CSE and IT)

Maximum Marks: 70

Date: 20.01.2024

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?		L1	CO1
2.	Why the central ring is dark in Newton's rings experiment.		L1	CO1
3.	What is the resolving power of an optical grating.		L1	CO1
4.	State the law of Malus.		L1	CO1
5.	Write the various applications of laser.		L1	CO2
6.	Write a short note on the components of laser.		L1	CO2
7.	Write the differences between step index & graded index fibres		L1	CO3
8.	What is numerical aperture and explain it		L1	CO3
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	CO4
10.	Define photo electric effect.		L1	CO4

Part- B

Answer all the following questions		5X10M=50Marks	Blooms Tx	CO
11.	(a) Explain the phenomenon of interference of light and derive an equation for path difference in the case of reflected light. [5M] (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. [5M]		L2 L3	CO1 CO1
OR				
12.	(a) Explain the construction and working of Michelson interferometer. [5M] (b) Write the difference between Michelson's & Machzender interferometer. [5M]		L2 L1	CO1 CO1
13.	(a) Describe Fraunhofer diffraction due to single slit and deduce the position of principle maxima and minima. [5M] (b) A slit of width 1.5mm is illuminated by the light of wave length 500nm & Diffraction pattern is observed on a screen 2m away. Calculate the width of the central maxima? [5M]		L2 L3	CO1 CO1
OR				
14.	(a) Explain quarter wave plate & half wave plate. [5M] (b) Explain the phenomenon of double refraction. [5M]		L2 L2	CO1 CO1

15.	(a) What are the important characteristics of laser radiation. [5M] (b) Explain the principle & working of semiconductor laser. [5M]	L1 L2	CO2 CO2
	OR		
16.	(a) Explain different vibrational modes of CO ₂ laser. [5M] (b) Explain the construction & working of CO ₂ laser. [5M]	L2 L2	CO2 CO2
17.	(a) Define acceptance angle and derive an equation for acceptance angle. [5M] (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. [5M]	L1 L3	CO3 CO3
	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	CO3 CO3
19.	(a) Explain the Max Planck's black body radiation energy distribution. [5M] (b) Derive Wein's law from Planck's law. [5M]	L2 L3	CO4 CO4
	OR		
20.	What is de Broglie's hypothesis? Derive an equation of de Broglie wave length of an electron? [10M]	L1	CO4