



R18 Regulation

Subject Code:2B1AF

TKR COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous & Accredited with NAAC 'A' Grade)

B.Tech I Semester Supplementary Examinations, September 2023

PHYSICS -I

(Common to EEE,ECE,CSE and IT)

Max. Marks: 70

Date:30.09.2023 Duration: 3 hours

NOTE: This question paper contains two parts A&B. Part A is compulsory which carries 20 marks. Answer all questions in part A. Part B consists of 5 units. Answer any one full question from each unit Each question carries 10 marks and may have a,b,c

PART A

All the following questions carry equal marks

10x2M=20Marks

1. Explain the phenomenon of interference of light
2. What is division of amplitude
3. Write any two differences between Fresnel and Fraunhofer diffraction
4. What is meant by polarization of light?
5. What is the principle involved in the working of laser. Explain it.
6. Write a short note on the components of laser.
7. Write the differences between step index & graded index fibres
8. What is numerical aperture and explain it
9. An electron is confined to one dimensional potential box of length $2A^0$ Calculate the energies corresponding to 2nd & 4th quantum states in eV
10. Write a short note on photo electric effect.

PART B

Answer all the following questions

10Mx5=50Marks

11. Discuss about the Newton's rings experiment. [10]

OR

12. Explain the construction and working of Michelson interferometer. [10]
13. (a) Describe Fraunhofer diffraction due to single slit and deduce the position of principle maxima and minima. [7]
(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? [3]

OR

14. (a) Explain quarter wave plate & half wave plate. [5]
(b) Explain the phenomenon of double refraction. [5]
15. (a) What are the important characteristics of laser radiation. [5]
(b) Explain the principle & working of semiconductor laser. [5]

OR

16. (a) Explain different vibrational modes of CO₂ laser. [5]
(b) Explain the construction & working of CO₂ laser. [5]
17. (a) Define acceptance angle and derive an equation for acceptance angle. [7]
(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. [3]

OR

18. Explain the optical fibres in communication system with neat diagram. [10]
19. Explain the Max Planck's black body radiation energy distribution. [10]

OR

20. (a) What is de Broglie's hypothesis? Derive an equation of de Broglie wave length of an electron? [7]
(b) Calculate the velocity and kinetic energy of an electron of wavelength $1.66 \times 10^{-10} \text{m}$. [3]