



R18 Regulation
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code: 2B1AF

B.Tech I Semester Supplementary Examinations, April 2022

PHYSICS – I

(Common to EEE, ECE, CSE & IT)

Maximum Marks: 70

Date: 02.05.2022 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=20 Marks)

- 1 Define coherence.
- 2 What is constructive interference?
- 3 State Brewster's law.
- 4 Explain Resolving power.
- 5 How to achieve population inversion in Laser?
- 6 What is the role of Nitrogen in He-Ne laser?
- 7 Define total internal reflection with diagram.
- 8 How fiber is classified based on the refractive index profile?
- 9 Write the important points of Planck's hypothesis.
- 10 State Heisenberg's uncertainty principle.

Part-B

Answer All the following questions.

(10M X 5=50Marks)

- 11 a. Give the theory of interference in thin films. (3)
b. Derive the condition for obtaining maximum and minimum intensity in case of thin films in the reflected light. (7)
- OR
- 12 a. Explain the construction and working of Michelson's interferometer. (7)
b. Why the central fringe in Newton's ring appears dark? (3)
- 13 a. Determine the wavelength of light using diffraction grating experiment (5)
b. Distinguish between Fresnel and Fraunhofer diffraction. (5)
- OR
- 14 a. Explain the principle and construction of Nicol prism. (5)
b. Discuss different types of polarization mechanisms. (5)
- 15 a. Explain the principle, construction and working of Ruby Laser. (7)
b. Explain the Stimulated emission process in Laser action. (3)
- OR
- 16 a. Explain the principle, construction and working of semiconductor diode laser. (7)
b. Mention the applications of Laser in the field of medicine. (3)

- 17 a. Calculate Acceptance angle of a fiber with Refractive index of core is 1.55 and refractive index of cladding is 1.50. (4)
b. Deduce an expression for Numerical aperture of an optical fiber. (6)
OR
- 18 a. Explain the construction and working of displacement sensor. (4)
b. Discuss the losses associated with the optical fiber. (6)
- 19 a. State de-Broglie Hypothesis. (3)
b. Derive an expression for Planck's black body radiation law. (7)
OR
- 20 a. What is Compton effect and derive an expression for Compton shift. (7)
b. Explain wave particle duality. (3)