



**R17 Regulation**

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**  
(Autonomous & Accredited by NAAC with 'A+' Grade)

**Subject Code: 1B1AH**

**B.Tech. I Year I Semester Supplementary Examinations, January 2024**

**ENGINEERING PHYSICS-I**  
(Common to *EEE, ECE, CSE & IT*)

**Maximum Marks: 70**

**Date: 22.01.2024 Duration: 3 hours**

**Part-A**

Answer all the following questions

10x2M=20M

1. Define coherence.
2. Define diffraction and mention different types of diffraction?
3. State Brewster's law.
4. Define the terms absorption, spontaneous emission and stimulated emission.
5. Define Acceptance angle and Numerical aperture of an optical fiber?
6. Write the need of Optical fiber?
7. Define the terms coordination number and packing fraction related to crystal structures.
8. Define a unit cell.
9. State and explain Bragg's law.
10. Name the four types of space lattices.

**Part-B**

Answer All the following questions

5X10M = 50M

11. Explain Newton's ring's experiment to determine the wavelength of a monochromatic source. 10 M

OR

- 12.a. Give the theory of Fraunhofer diffraction due to single slit. 5M
- 12.b. What is the difference between interference and diffraction? Find the maximum order of diffraction of a grating element and the angle it makes with the incident direction, given the wavelength of the light is 400nm and number of lines per inch (LPI) of the grating 15000. 5M
13. a. State and explain Malus's law. What is double refraction? Explain with figure. 5M
- 13.b. What are Quarter wave plate and Half wave plate. 5M

OR

- 14.a. With neat diagrams, describe the construction and working of Ruby laser. 5M
- 14.b. Explain population inversion. Mention important applications of LASERS. 5M

15. Draw the block diagram of optical fiber communication system and explain the function of each block. 10M

OR

16.a. What are attenuation losses in optical fibers. Explain in detail. 5M

16.b. Write the applications of optical fibers in industries and in medical field. 5M

17.a. Derive an expression for interplanar spacing in orthogonal system. 5M

17.b. Define Miller Indices and mention the steps involved. Sketch (110) & (001) the planes in a cube. 5M

OR

18.a. Describe seven crystal systems with neat diagrams. 5M

18.b. Calculate the packing fraction for HCP structure. 5M

19.a. Describe with suitable diagram the Laue method of X-ray diffraction and give the consequences. 5M

19. b. Define point defects? What are different types of point defects. 5M

OR

20. Explain different types of line defects. How the burger's vector is used to find the edge and screw dislocations. 10M