



R17 Regulation

Subject Code: 1B1AH

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech. I Year I Semester Regular Examinations, June 2024

ENGINEERING PHYSICS-I

(Common to EEE, ECE, CSE & IT)

Maximum Marks: 70

Date: 01.07.2024 Duration: 3 hours

Part-A

Answer all the following questions

10X2M=20 Marks

1. Define coherence.
2. Define diffraction.
3. Define the wave length.
4. Define the terms absorption, spontaneous emission and stimulated emission.
5. Define Acceptance angle.
6. Explain the construction of optical fiber?
7. Define the terms coordination number and packing fraction related to crystal structures.
8. Find the maximum radius of the interstitial sphere that can just fit into the void between the atoms in BCC structure.
9. State and explain Bragg's law.
10. Explain stacking faults in crystals?

Part-B

Answer All the following questions

5X10M = 50 Marks

11. With ray diagram discuss the theory of thin films and derive the condition for constructive and destructive interference in the case of transmitted light? 10M
- 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. State and explain Malus's law. What is double refraction? Explain with figure. 10M

OR

14. With neat diagrams, describe the construction and working of Ruby laser. 10M

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. Define Miller Indices and mention the steps involved. Sketch (110) & (001) the planes in a cube. 10M

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