R17 Regulation

Subject Code: 1B1AH

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Year Semester Supplementary Examinations, September 2023

ENGINEERING PHYSICS-I

(Common to EEE,ECE,CSE & IT)

Maximum Marks: 60 Date:03.10.2023 **Duration: 3 Hours**

Note:
1. **This question paper contains two parts A and B.**
2. **Part A is compulsory which carries 10 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. Give the necessary conditions to produce interference of light.
2. A slit is illuminated with a light of 6000 °A. The angular separation between the first-order minima on either side of the central maximum is 6°. Calculate the width of the slit.
3. State Brewster's law.
4. What are characteristics of laser that makes it far superior than ordinary light?
5. Explain the term 'attenuation' in optical fibers.
6. What do you understand by 'intermodal dispersion'?
7. Define an unit cell.
8. Name the four types of space lattices.
9. Explain, the use of Burger's vector.
10. What are called as volume defects?

Part –B

Answer all the questions Marks: 10x5=50M

11. Describe an experiment to produce Newton's rings and obtain the condition for obtaining bright and dark rings. (10 marks)

(or)

12. a). Distinguish between Fresnel and Fraunhofer diffraction. (4marks)

b). Explain with theory the Fraunhofer diffraction at a single slit and show that secondary wavelets that travel normal to the slit can produce principal maxima. (6marks)

13. a). write a short note on double refraction (5marks)

b).Explain the working of a Nicol prism as a polarizer and analyzer. (5marks)

(or)

14. With a neat sketch, explain the principle, construction and working of a He-Ne laser (10marks)

15. Discuss the classification of optical fibers based on modes available for propagation and their refractive index profile. (10marks)

(or)

16. Explain the working of an optical fiber communication system and list out its advantages over conventional system (6+4=10marks)

17. a) Determine the effective number of atoms, atomic radius of a FCC unit cell and hence, calculate its density of packing. (7marks)

b) The distance d_{110} between (110) planes in a BCC crystal is 2.03 °A, then calculate the side of the unit cell. (3marks)

(or)

18. Diamond, being the hardest substance on the earth has a very low packing density-justify this statement by discussing the diamond cubic structure in detail. (10 marks)

19. Describe the procedure involved in powder method of analyzing polycrystals using x-ray diffraction technique. (10 marks)

(or)

20. Discuss the point defects and line dislocations in detail,with necessary diagrams. (10 marks)