R17 Regulation *Subject Code:1B1AH*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech. I Year I Semester Supplementary Examinations, April 2022

ENGINEERING PHYSICS-I

(Common to EEE, ECE, CSE & IT)

Maximum Marks:70 Date:05.05.2022 Duration: 3hours

Part-A

Answer all the following questions 10x2M=20 Marks

1. Write down the different types of interference.
2. What is plane diffraction grating?
3. What is quarter wave plate explain?
4. Define the terms pumping and population inversion in lasers?
5. What is the principle of optical fibre.
6. Write down the applications of Optical fibre.
7. Write a note on lattice parameters of a unit cell.
8. Calculate the packing fraction of BCC structure.
9. Describe point imperfection (a) vacancy, (b)Frenkel defects .
10. What is the Burger vector?

PART-B

Answer All the following questions Marks: 5 x 10M = 50M

11. What is coherence? How many types coherences. Explain them. (10m)

OR

12. Explain experimental method of determination of wave length of spectral lines of a given source of light using plane transmission grating. (10m)

13. Explain the Nicols prism and double refraction. (10m)

OR

14. With neat diagrams, describe the construction and action of He-Ne laser (10m)

15. Explain the phenomenon of total internal reflection and derive the expression for numerical aperture of an optical fibre. (10m)

OR

16. Explain optical fibres in communication systems with neat diagram. (10m)

17. What are crystal planes and directions? Draw the following planes (010), (110) and (111) (10m)

OR

18. Derive an expression for the inter-planar spacing in the case of orthogonal crystal. (10m)

19. (a) A beam of X-rays is incident on an ionic crystal with lattice spacing 0.313nm. Calculate the wavelength of X-rays if the 2^{nd} order Bragg reflection takes place at a glancing angle of $7^0 48'$. (5m)

(b) Derive expression for Bragg's law of X-ray diffraction. (5m)

OR

20. (a) How many types of surface defect? Explain each of them. (5m)

(b) What are the differences b/w edge dislocation and screw dislocation. (5m)