Code No: 131AH

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year I Semester Examinations, May/June - 2019
ENGINEERING PHYSICS
(Common to EEE, ECE, CSE, EIE, IT, ETM)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each
question carries 10 marks and may have a, b, c as sub questions.

PART- A
(25 Marks)

1.a)   Define temporal and spatial coherence.   [2]
  b)   Explain the significance of beam splitter in Newton's rings experiment.   [3]
  c)   Write applications of nicol prism.   [2]
  d)   What is the importance of population inversion?   [3]
  e)   What is total internal reflection? Explain.   [2]
  f)   Write any four applications of optical fibers.   [3]
  g)   Define space lattice, unit cell and lattice parameters.   [2]
  h)   Calculate packing fraction of simple cube.   [3]
  i)   State and explain Bragg's law.   [2]
  j)   Discuss about line defects.   [3]

PART-B
(50 Marks)

2.a)   Explain interference in thin films in reflected light.
  b)   Describe experimental setup of Newton's rings experiment and obtain expression for
       radius of curvature of plano-convex lens.   [5+5]
                                    OR
3.a)   Compare Fresnel's and Fraunhofer diffraction.
  b)   Discuss in detail about diffraction grating experiment.   [5+5]

4.a)   Describe construction and working of a nicol prism.
  b)   Establish relation between Einstein's coefficients.   [5+5]
                                    OR
5.a)   Write in detail about quarter and half wave plate.
  b)   Discuss about construction and working of Ruby laser.   [5+5]

6.a)   Derive an expression for acceptance angle and numerical aperture.
  b)   Discuss about transmission of light in step index and graded index fibers. [5+5]
                                    OR
7.a)   Discuss about construction and principle of optical fiber with the help of neat diagram.
  b)   Describe various types of losses in optical fibers.   [5+5]

8.a) Discuss about seven crystal systems and their corresponding Bravias lattice with the help of neat diagrams.

b) Discuss about HCP and diamond structures. [5+5]

OR

9.a) Explain salient features of miller indices.

b) Derive an expression for inter planar spacing of orthogonal crystal system. [5+5]

10.a) Give an account of point defects.

b) Derive an expression for the concentration of Schottky defects at a given temperature.

[5+5]

OR

11.a) Discuss about powder method of X-ray diffraction with the help of neat diagram.

b) Explain the significance of Burger's vector. [5+5]

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