R16

Code No: 131AH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year I Semester Examinations, May/June - 2019
ENGINEERING PHYSICS - I
(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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