R16

Code No: 131AC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year I Semester Examinations, December - 2017
ENGINEERING PHYSICS
(Common to CE, ME, MCT, MMT, AE, MIE, PTM, CEE, MSNT)

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)	What are the conditions for coherence?	[2]
b)	Distinguish between Fresnel and Fraunhoffer diffraction.	[3]
c)	State Malu's law.	[2]
d)	Distinguish between spontaneous and stimulated emission of radiation.	[3]
e)	Define the terms numerical aperture and acceptance angle.	[2]
f)	What are the applications of optical fibres?	[3]
g)	Define the terms unit cell and lattice parameters.	[2]
h)	Calculate packing factor of BCC and FCC lattices.	[3]
i)	State Bragg's law.	[2]
j)	What are point defects?	[3]

PART-B

(50 Marks)

2.a)	Describe interference in thin films by reflected light.	
b)	Explain single slit diffraction quantitatively.	[5+5]
	OR	
3.a)	Describe Newton's rings experiment to determine wave length of light.	
b)	Discuss the theory of N-slits diffraction.	[5+5]
4.a)	Explain the theory of double refraction.	
b)	Discuss the working principle of quarter wave plate.	[5+5]
	OR	
5.a)	Describe the construction, principle and working of He-Ne laser.	
b)	What are the applications of lasers?	[5+5]
6.a)	Derive the expression for numerical aperture and acceptance angle of a fibre.	
b)	What are the classification of attenuation in fibres?	[5+5]
	OR	
7.a)	Distinguish between step index and graded index fibre.	
b)	Explain total internal reflection principle in fibres.	[5+5]

8.a) What are miller indices? Explain the procedure to index a plane.
b) Calculate atomic radius in the case of BCC and FCC lattices. [5+5]

OR

9.a) Discuss the classification of crystal systems.
b) Find the relation between inter planar spacing and lattice parameters in a cubic system. [5+5]

10.a) Discuss X-Ray diffraction Laue method to determine lattice parameters.
b) Distinguish between Frankel and Schottky defects. [5+5]

OR

11.a) Describe powder method to determine lattice parameters of a crystal.
b) Distinguish between interstitial and substitutional defects. [5+5]

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