

Code No:131AH**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD****B.Tech I Year I Semester Examinations, December - 2018****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)**

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|------|---|-----|
| 1.a) | Define interference. | [2] |
| b) | What is diffraction | [3] |
| c) | Explain the phenomenon of polarization of light. | [2] |
| d) | Explain spontaneous emission. | [3] |
| e) | Write any two applications of optical fiber. | [2] |
| f) | What is optical fiber? Explain basic principle of optical fiber | [3] |
| g) | Define Space lattice. | [2] |
| h) | Distinguish between unit cell and primitive cell. | [3] |
| i) | What are the conditions to occur diffraction due to X-rays? | [2] |
| j) | Define Burger's vector. | [3] |

Part-B**(50 Marks)**

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|------|---|---------|
| 2.a) | Discuss interference in thin film due to transmitted light. | |
| b) | Write a note on Newton's ring experiment. | |
| c) | What is Coherence? | [4+4+2] |

OR

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|------|---|---------|
| 3.a) | Write a note on division of amplitude. | |
| b) | Distinction between Fresnel and Fraunhofer diffraction. | |
| c) | Discuss diffraction due to N- silts. | [3+3+4] |

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|------|--|---------|
| 4.a) | Explain Malus law. | |
| b) | What is double refraction? | |
| c) | Explain the terms population and population inversion. | [3+3+4] |

OR

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|------|---|---------|
| 5.a) | Explain Quarter wave plate. | |
| b) | With neat diagram explain working principle of Ruby laser system. | |
| c) | Write any two applications of lasers. | [3+5+2] |

- 6.a) With neat diagram explain construction of optical fiber.
b) Derive an expression for Acceptance angle.
c) Derive an equation for Numerical aperture. [4+3+3]

OR

- 7.a) Explain how Step index optical fibers are classified.
b) Write a note on graded index optical fiber.
c) What are the medical applications of optical fiber? [4+4+2]

- 8.a) With neat diagram explain types of crystal systems.
b) Define crystal plane.
c) Discuss construction of Diamond structure. [4+2+4]

OR

- 9.a) What are the Bravais lattices?
b) What are the Miller indices?
c) Derive an expression for inter planner spacing of orthogonal crystal system. [4+3+3]

- 10.a) Derive an equation for Bragg's law.
b) Discuss powder method.
c) Explain vacancy defect. [4+4+2]

OR

- 11.a) Discuss Laue method.
b) What is Frenkel defect?
c) Write a note on Schottky defect. [4+3+3]

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