

R15

Code No: 121AD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I Year Examinations, August - 2018

ENGINEERING PHYSICS

(Common to CE, EEE, ME, ECE, CSE, EIE, IT, MCT, ETM, MMT, AE, AME, 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)

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|------|--|-----|
| 1.a) | What is Covalent Bond? | [2] |
| b) | What is Vander-Waal's Bond? | [3] |
| c) | Define an Ensemble. | [2] |
| d) | What is the importance of Density of States? | [3] |
| e) | Define the Dipole Moment. | [2] |
| f) | What is the importance of Dielectric Constant? Explain. | [3] |
| g) | Define Acceptance Cone. | [2] |
| h) | What is the importance of Step Index fiber? | [3] |
| i) | Explain about bottom-up approach for synthesis of nanomaterials. | [2] |
| j) | Define the Reverberation Time. | [3] |

PART-B

(50 Marks)

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|-----------|--|-------|
| 2.a) | Describe in detail powder method to determine the crystal parameter. | |
| b) | Deduce the expression for the inter planar distance in terms of Miller indices for a cubic structure. | [5+5] |
| OR | | |
| 3.a) | Give an account of Ionic Bond, Metallic Bond, Hydrogen Bond and explain with suitable examples. | |
| b) | Write notes on structure of NaCl crystal. | [5+5] |
| 4.a) | On the basis of band theory how the crystalline solids can be classified into conductors, semiconductors and insulators? | |
| b) | Write an essay on Davisson and Germer's Experiment. | [5+5] |
| OR | | |
| 5.a) | Write short notes on Bloch Theorem and Kronig-Penny Model (Qualitatively) | |
| b) | Write the Physical Significance of the Wave Function in detail. | [5+5] |

- 6.a) Derive an expression for calculation of internal field for a cubic dielectric crystal
b) Derive and establish the importance of Clausius - Mossotti Equation. [5+5]

OR

- 7.a) Explain in detail the characteristics of B-H curve of ferromagnetic material and What are hysteresis losses? Explain.
b) Write short notes on Piezo -electricity and Ferro- electricity. [5+5]

- 8.a) Describe principle of Newton rings experiment and derive an expression for radius of curvature of plane convex lens.
b) Write a note on Application of Optical Fiber in communication systems with the help of block diagram. [5+5]

OR

- 9.a) Write characteristics of Lasers.
b) Write notes on Spontaneous and Stimulated Emission of Radiation. [5+5]

- 10.a) Derive an expression for carrier concentration in Intrinsic Semiconductors.
b) Write notes on Quantum Confinement. [5+5]

OR

- 11.a) Write short note on I-V Characteristics of PN Junction diode.
b) Write a note on Direct and Indirect Band gap semiconductors. [5+5]

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