R15

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)

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)

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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