

Code No: 121AD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year Examinations, December – 2019/January - 2020

ENGINEERING PHYSICS

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

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 Ionic bond. [2]
- b) Explain Burger's vector. [3]
- c) Name the experiments which supports concept of the dual nature of the light? [2]
- d) Draw E-K diagram. [3]
- e) Define Electric Susceptibility. [2]
- f) Explain Meissner Effect. [3]
- g) What is Interference? [2]
- h) Explain Lasing Action. [3]
- i) Explain the term Nano Scale. [2]
- j) Distinguish between Direct and Indirect Band gap semiconductors. [3]

PART-B**(50 Marks)**

- 2.a) Write a note on Hydrogen Bond.
 - b) Calculate packing factor of BCC.
 - c) Derive an expression of Bragg's Law. [3+3+4]
- OR**
- 3.a) Define Vander-Waal's Bond.
 - b) Estimate Cohesive Energy of diatomic molecule.
 - c) With a diagram explain Powder method. [2+4+4]
- 4.a) Drive an expression of de-Broglie's hypothesis.
 - b) Discuss Density of States.
 - c) What are Matter Waves? [4+4+2]
- OR**
- 5.a) Derive Schrödinger's Time independent wave equation.
 - b) Discuss Kronig-Penny Model.
 - c) Derive an expression of concept of effective mass of an electron. [3+4+3]
- 6.a) Derive an equation for Ionic polarizability.
 - b) What is Hysteresis curve? Explain it using domain theory of ferro magnetism.
 - c) Distinguish between Anti-Ferro and Ferri magnetic materials. [4+3+3]
- OR**
- 7.a) Derive an expression of Clausius - Mossotti equation.
 - b) Distinguish between Soft and Hard Magnetic Materials.
 - c) What is Ferro- electricity? Explain in details. [4+3+3]

- 8.a) In detail discuss Newton rings experiment.
b) With neat diagram explain working principle and construction of He-Ne Laser. [5+5]

OR

- 9.a) Explain construction and working of Nicol's Prism.
b) Write a note on Semiconductor diode laser. [5+5]

- 10 .a) Explain working principle and construction of LED.
b) What are the factors affecting the architectural acoustics.
c) Explain the term surface to volume ratio. [4+3+3]

OR

- 11.a) Define Reverberation of Time.
b) Explain working principle of Photo Diode.
c) Write a note on Quantum Confinement. [3+4+3]

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