Total No. of Question : [4] **Registration No. :** | | | | | | | | | |

Programme Name : F.Y.B.Tech
Regular F.Y.B.Tech. ESE Sem. I (A.Y.2023-24) Dec.2023
I SEMESTER (2023 BATCH)
231FYL102-Applied Physics

Duration : [- - -]
Date : -
Day : -
Marks : 50

Instructions :

(Q1) **All Questions are compulsory** [20.0]

(1.1) In Newtons Ring experiment, show that the diameter of nth bright ring is directly proportional to square root of odd natural numbers. [6.0]

CO :- 102.1
Blooms Taxonomy :- Remember, Understand, Apply

(1.2) Which methods are used to produce ultrasonic waves. Explain the Construction and working for production of ultrasonic waves using Magnetostriction oscillator. [7.0]

CO :- 102.2
Blooms Taxonomy :- Understand, Apply

(1.3) Explain the variation Fermi energy level with temperature for n type semiconductors. [7.0]

CO :- 102.3
Blooms Taxonomy :- Remember, Understand, Apply

(Q2) Attempt any **two** questions from following [10.0]

(2.1) Determine the velocity and kinetic energy of **neutron** and **electron** having de Broglie wavelength 2 A^0. Given- the mass of neutron 1.67 x 10^{-27} Kg. [5.0]

CO :- 102.4
Blooms Taxonomy :- Remember, Understand, Apply

(2.2) Derive the time-dependent Schrodingers wave equation. [5.0]

CO :- 102.4
Blooms Taxonomy :- Remember, Understand, Apply

(2.3) Derive the time-independent Schrodinger wave equation for partcile moving with wavefunction. [5.0]

CO :- 102.4

Blooms Taxonomy :- Remember, Understand, Apply

(Q3) Attempt any two questions from following [10.0]

(3.1) Explain the terms (i) Population Inversion (ii) Stimulated emission (3) Spontaneous emission [5.0]

CO :- 102.5
Blooms Taxonomy :- Remember, Understand, Apply

(3.2) Discuss in detail, any 5 characteristics of LASER to produce efficient laser beam in medium [5.0]

CO :- 102.5
Blooms Taxonomy :- Remember, Understand, Apply

(3.3) Explain the construction of He-NE LASER and describe the action of HE-Ne LASER with the help of energy level diagram. [5.0]

CO :- 102.5
Blooms Taxonomy :- Remember, Understand, Apply

(Q4) Attempt any **two** questions from following [10.0]

(4.1) Explain the top bottom process and discuss the working for High energy Ball milling method to produce nanoparticles. [5.0]

CO :- 102.6
Blooms Taxonomy :- Remember, Understand

(4.2) Write short note on applications of nanomaterials in various fields. [5.0]

CO :- 102.6
Blooms Taxonomy :- Remember, Understand

(4.3) Discuss any 5 properties of nanomaterials in increase the efficiency of nano devices. [5.0]

CO :- 102.6
Blooms Taxonomy :- Remember, Understand

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