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Paper Name: Applied Physics-II

Paper Code: BTCSE -101/BTECE-101

Time: 3 Hours

Maximum Marks: 75

- Note: 1. Follow proper numbering for answering the questions.
2. It is compulsory to answer all the questions of Section A.
3. Answer any four questions in Section B.*

Section – A

**Instruction - All questions in this section are compulsory. Each question carries 5 marks.
(7X5=35)**

Q. N	Questions	Marks	CO	BL
1.	What are optical fibers? Write short note on single mode and multimode fibers.	5	CO2	L3
2.	How do you distinguish among metals, insulators and semiconductors on the basis of their band structures?	5	CO3	L1
3.	How are superconductors different from metals? Explain briefly.	5	CO3	L5
4.	Write down two important differences between interference and diffraction	5	CO4	L4
5.	In Young's Double Slit Experiment two coherent sources whose intensity ratio is 25 :9 produce interference fringes. Find out the ratio of maximum intensity to minimum intensity.	5	CO1	L4
6.	Write down five applications of LASER	5	CO1	L2
7.	Why is Stimulated Emission of Radiation so important in the operation of a LASER?	5	CO1	L2

Section-B

Instructions - There are **six questions** in this section. You are required to attempt **any 4 questions out of 6 questions**. Each question carries equal marks.

(4x10=40)

Q. N	Questions	Marks	CO	BL
8.	Derive the expression for fringe width in Young Double Slit Experiment. On what factors does it depend?	10	CO2	L4
9.	Define Fermi energy. Calculate the number of donor atoms per m^3 of N-type material having resistivity of 0.20 Ohm-m, the mobility of electrons is $0.28 m^2/V-s$.	10	CO1	L1
10.	What is a metastable state? Describe the construction and working of He-Ne Laser or Ruby Laser with necessary diagrams.	10	CO4	L2
11.	What is dispersion in optical fibers? Derive an expression for numerical aperture of optical fiber.	10	CO2	L3
12.	What is Meissner Effect? Explain Type-I and Type-II super conductors.	10	CO5	L5
13.	What is a diffraction grating? Derive an expression for the resolving power of Plane Diffraction Grating.	10	CO3	L4

*BL-Bloom's taxonomy levels (1-Remembering, 2-Understanding, 3-Applying, 4-Analysing, 5- Evaluating, 6- Creating)

CO- Course Outcomes