(2)

Roll No. ..... Total Pages : 3

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Jan. 2022
M.Sc. (PHYSICS) 3RD SEM
Laser Technology (PHL-303)

Time : 90 Minutes] [Max. Marks : 25

Instructions :

1. *It is compulsory to answer all the questions (1 mark each) of Part-A in short.*
2. *Answer any three questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) Explain metastable state and population Inversion. (1)

(b) Explain collision in dye laser. (1)

(c) Define energy levels of Nd:YAG laser. (1)

(d) How excimer laser is different from other laser? (1)

(e) How to obtain the coherent radiation in laser system? (1)

(f) Differentiate between stimulated emission and Raman stimulated scattering. (1)

(g) Define important features of two photon absorption. (1)

(h) What is resonator? (1)

(i) Define the pumping mechanism in laser. (1)

(j) Define π-polarization in laser cooling. (1)

PART - B

2. (a) Explain Molecular Gas Laser with schematic and energy level diagram. (3)

(b) Differentiate Homo-structure and Hetero-structure semiconductor Lasers (2)

3. (a) How non-linear optical materials are defined. Describe in detail the phase matching through a non-linear crystal. (2.5)

(b) Discuss the trapping of atoms using single laser beam. (1.5)

(c) Explain multiquantum Photoelectric effect? (1)

4. (a) Explain the working of Optical Pumping with probable transition. (2.5)

(b) Explain characteristics of laser beam. (2.5)

5. (a) Define experimental verification of laser cooling. (3)

(b) Explain Doppler cooling and optical molasses. (2)

6. (a) Is lasing action possible in two level system? Illustrate it. (2)

(b) Explain Stimulated Raman Scattering in non-linear optics. (3)