

M.Sc. (Physics) (NEP Pattern) Semester-IV
04MSCPH2 - Major Paper-II : Physics of LASER and its Applications

P. Pages : 2

Time : Three Hours



GUG/S/25/16376

Max. Marks : 80

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- Notes : 1. All questions are compulsory.
2. Draw neat labelled diagram wherever necessary.

Either:

1. a) Explain in detail Einstein relation in LASER. 8
b) Explain concept of stimulated emission and population Inversion. 8

OR

- e) Explain working of Fabry-Parot Etalon with plane parallel reflector. 8
f) Explain in detail longitudinal and transfer mode of Laser Cavity. 8

Either:

2. a) Explain in detail principle of Laser action. 8
b) Explain Laser oscillation with threshold condition. 8

OR

- e) Explain mechanism of three level laser. 8
f) Explain concept of spectral narrowing and stabilization. 8

Either:

3. a) Explain principle construction & working and energy level diagram of Ruby LASER. 8
b) Explain construction working and energy level diagram of Helium-Neon LASER. 8

OR

- e) Explain spectroscopic properties of organic molecule and Dye LASER. 8
f) Explain tunable solid state LASER in details. 8

Either:

4. a) Explain the working of LASER in communication. 8

- b) Explain the term Holography in details. 8

OR

- e) Explain any four applications of LASER in medical science. 8

- f) Explain any four industrial application of LASER. 8

5. All questions are compulsory.

- a) Explain in short gain in regenerative cavity. 4

- b) Explain Gaussian beam and its properties. 4

- c) Explain in short Excimer LASER. 4

- d) Explain Laser Hazards and Laser safety. 4
