S.No. 3228 **P 8 PYE 5**

(For candidates admitted from 2008 - 2015 Batch)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

PHYSICS - Elective

NON LINEAR OPTICS

Time: Three hours **Maximum: 75 marks**

PART A — (10 × 2 = 20)
Answer ALL questions.

1. Explain the principle of p-n junction laser.

2. What are the three important components in constructing Ruby laser?

3. What is an anisotropic crystal?

4. Define optical bistability.

5. Write short note on oscillator.

6. Explain two photon process.

7. What is the purpose of XRD analysis?

8. List the uses of Nitroaniline.

9. Define dispersion.

10. Define the attenuation coefficient in optical fibre communication.

PART B — (5 × 5 = 25)
Answer ALL questions, choosing either 'a' or 'b'

11. a) Elaborate the working principle of Ruby laser.
(OR)
b) Explain the construction and working of any p - n Junction laser.

12. a) Write in detail about self focusing in non - linear optics.
(OR)
b) Explain about phase matching.

13. a) Write a short note on stimulated Raman scattering.
(OR)
b) Write in detail about Electron Optic Effect.

14. a) Write short note on Nitroaniline.

(OR)

b) Write down the characteristics of organic materials.

15. a) Write about the types of fibre optic losses in fibre optic cables.

(OR)

b) Explain the attenuation co-efficient.

PART C — (3 × 10 = 30)
Answer any THREE Questions

16. What is a gas laser? Give detailed note on the working of He - Ne laser.

17. Explain in detail about Second Harmonic Generation and phase matching.

18. Describe the two photon process and derive an expression for two photon absorption rate.

19. Explain the working principle of FTIR.

20. Write detailed note on step and graded index fibre.

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