

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2004-05 & thereafter)

SUBJECT CODE : **PH/MO/LP34**

B.Sc. DEGREE EXAMINATION NOVEMBER 2008
BRANCH III – PHYSICS
THIRD SEMESTER

COURSE : **MAJOR – OPTIONAL**
PAPER : **LASER PHYSICS**
TIME : **3 HOURS**

MAX. MARKS : **100**

SECTION – A

ANSWER ALL QUESTIONS: (10 x 3 = 30)

1. Give the condition for stimulated emission.
2. What is absorption.
3. Define laser. Name the types of laser.
4. Distinguish between the solid state laser and ruby laser.
5. Explain the working of HCL laser.
6. Define the term intrinsic and doped semiconductor laser.
7. Explain the uses of laser in cancer.
8. Which type of laser used for welding, drilling and cutting.
9. What are optical resonators.
10. Distinguish between the three and four level system in laser.

SECTION – B

ANSWER ANY SIX QUESTIONS: (6 x 5 = 30)

11. Discuss the technique for selecting longitudinal mode in a laser oscillation.
12. Obtain the equation relating Einstein's co-efficient.
13. With energy level diagram explain the working of a ruby laser.
14. Draw a schematic diagram of a Dye laser and explain its function.
15. Discuss the P-type and the n-type semiconductors and how they used in obtaining population inversion.

- 16. Explain important applications of holography.
- 17. With a diagram, explain how laser is used for velocity measurement.
- 18. Write a note on lasers in Isotope separation.

SECTION – C

ANSWER ANY TWO QUESTIONS:

(2 x 20 = 40)

- 19. What are laser rate equation?
Derive laser rate equation for a three level laser and the conditions for laser oscillation to occur.
- 20. Explain with necessary theory the principle and working of the carbon dioxide laser.
- 21. With diagram explain how a hologram is recorded and how the image is reconstructed. What are the characteristic features.
- 22. Explain the laser application in Lidar.

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