STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2008-09)

SUBJECT CODE : **PH/ME/LP54**

B.Sc. DEGREE EXAMINATION NOVEMBER 2010
BRANCH III - PHYSICS
FIFTH SEMESTER

COURSE : **MAJOR – ELECTIVE**
PAPER : **LASER PHYSICS**
TIME : **3 HRS.** MAX. MARKS : 100

SECTION - A

ANSWER ALL QUESTIONS: (10 x 3 = 30)

1. What is stimulated emission?
2. What is pumping action? Mention the name of the methods used for pumping action?
3. What is the principle of Nd-YAG laser?
4. What is laser? Name the types of laser?
5. What is the principle of carbon dioxide laser? First molecular laser was developed by whom?
6. Explain the working of Co laser.
7. What are the advantages of semiconductor laser?
8. Explain how a hologram differs from an ordinary photograph?
9. Name any three uses of laser in medical.
10. What is Lidar? Where is it used?

SECTION – B

ANSWER ANY <u>SIX</u> QUESTIONS: (6X5=30)

11. What is population inversion? What are the conditions?
12. Explain the basic components of a laser?
13. Explain the characteristics of laser?
14. Compare Nd-YAG, CO_2 and Semi conductor laser.
15. The wavelength of He-Ne laser is 632.8 nm. Its output power is 3.147 mW. How many photons are emitted at each minute when it is in operation.
16. What are the applications of holography?
17. What is the principle of holography? What are the steps in holography?
18. Mention the important industrial applications of a laser.

SECTION – C

ANSWER ANY <u>TWO</u> QUESTIONS: (2X20=40)

19. Explain the Einstein's theory of spontaneous emision and stimulated emission.
20. Describe the construction, energy level diagram and working of Nd-YAG laser.
21. Describe the construction and working of CO_2 laser with necessary diagrams.
22. Explain how a hologram is recorded and how the image is reconstructed. What are the characteristic features of Holography?

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