STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2011-12 & thereafter)

SUBJECT CODE : 11PH/ME/LP63

B.Sc. DEGREE EXAMINATION APRIL 2016
BRANCH III - PHYSICS
SIXTH SEMESTER

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

Section-A   **10X3=30**
Answer all Questions:

1. Define meta-stable state and its significance of in laser action?
2. Write the configure of 'confocal cavity'
3. If the Light wavelength 550 nm has wave trains 10.5×10^{-6} m long, calculate its coherent length.
4. Define the divergence angle of laser?
5. Differentiate the liquid laser and gas laser.
6. Write the properties of P-type semiconductor
7. What are the advantages of laser diode?
8. Write some industrial application of laser.
9. Write the advantages of Bar code scanner?
10. Define: Doppler shift.

Section-B   **5X6=30**
Answer any Five Questions:

11. Explain different types of pumping techniques in different types of laser.
12. Discuss the construction and working of Nd:YAG laser.
13. Discuss the tunable dye laser and its relative advantages.
14. With the neat energy level diagram for explain the working of CO_2 laser.
15. Give the basic principle of holography techniques? How are laser used in recording a hologram.
16. What is LIDAR? Discuss its application in (a) Agriculture (b) Archeology
17. Discuss the application of laser for the treatment of eye surgery.

Section-C   **2X20=40**
Answer any Two Questions:

18. Derive an expression of Einstein's coefficient in the laser action.
19. Obtain the relation for optimum output power of three level laser system.
20. Explain with help of an appropriate energy level diagram how stimulated emission results from electron impact pumping in He-Ne gas laser.
21. Explain the laser action is achieved in a semi conductor laser? With help of energy band diagram discuss the working of semiconductor laser.

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