LASERS - II

Semester-IV

Time Allowed : Three Hours **Maximum Marks : 30**

Note : Attempt two questions each from Section A and B carrying 5 marks each, and the entire Section C consisting of 7 short answer type questions carrying 2 marks each.

SECTION-A

I. Derive the threshold condition for Laser oscillations. 5

II. Explain Doppler broadening in detail. 5

III. Distinguish between spontaneous and stimulated emission. 5

IV. What is Population inversion ? How is it achieved in a Laser? 5

SECTION–B

V. Briefly discuss Semiconductor laser. 5

VI. Explain Mode locking. 5

VII. What is Holography ? Explain. Give its uses. 5

VIII. Discuss Nd-YAG Laser. 5

SECTION–C

IX. Attempt any five parts :

(a) Laser beams are highly directional. Explain.

(b) What is Non-homogeneous broadening ?

(c) Explain why Four-level laser is less efficient as compared to Three-level laser.

(d) What is Laswer spiking ?

(e) Give four applications of Lasers.

(f) Laser light is highly monochromatic. Why ?

(g) Optical pumping cannot be used for gas lasers. Why ? (5×2=10)