

III B.Tech II Semester Supplementary Examinations, April/May 2005
OPTO ELECTRONICS AND LASER INSTRUMENTATION
(Electronics & Instrumentation Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Briefly explain about the optical fibre construction details and show a figure for transmission of light rays and discuss about the refractive index distribution with a graph.
(b) Write the equations for the total internal reflection of the light rays in a optical fibre cable and derive the expression for the Numerical Aperture of the fibre.
2. (a) What is the necessity of optical fibers in communication explain the steps involved in developing a communication system using optical fibers with figures.
(b) List out the applications of optical fibers in Instrumentation and explain the operation of one instrument using optical fibers with a figure.
3. (a) Explain the principle and operation of a semiconductor lasers. Discuss the merits and demerits of lasers melting.
(b) Estimate the number of photons emitted per second from a laser that puts out one watt of power. State clearly the assumptions made.
4. (a) Write in detail about IR detectors.
(b) Describe the working of Moire-Fringe modulation fiber optic sensor.
5. (a) What is an Evanescent sensor? Explain.
(b) List the limitations of the Evanescent sensor ?
6. With neat sketches explain the following applications of lasers in detail:
 - (a) Lasers in diagnostics
 - (b) Lasers in photo medicine.
7. (a) With the help of neat sketches explain holographic interferometry?
(b) With the help of neat sketches explain holographic computer memories?
8. (a) Discuss the acousto - optic Bragg modulator.
(b) Why Bragg diffraction modulators are preferred over Raman - nath modulator.
