Code :R5321005

R5

III B.Tech II Semester(R05) Supplementary Examinations, April/May 2011
OPTO ELECTRONIC & LASER INSTRUMENTATION
(Electronics & Instrumentation Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks

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1. (a) What is meant by light guidance? Explain about the reflection of ray at a plane boundary.
   (b) Define 'Reflectance' and 'Reflection coefficient'.
   (c) A ray of light enters a glass optical fiber of Refractive index 1.45 surrounded by air. Calculate the angle of incidence greater than which total internal reflection occurs.
2. (a) What is an optical fiber coupler? what are mechanisms associated with two broad categories of optical fiber couplers?
   (b) Write short notes on Transmissive star coupler and reflective star coupler.
3. (a) What is the function of resonator cavity in lasers?
   (b) Discuss about different methods used for pumping action in lasers.
   (c) Derive the equation for threshold condition to achieve population Inversion.
4. (a) Discuss in detail about the factors affecting the propagation of light through optical sensors.
   (b) What are the effects that happen to the light in using intensity modulation based fiber sensors? Explain.
5. (a) With neat diagram explain about laser fusion in power plants.
   (b) With necessary diagrams explain how lasers are useful in surgery.
6. With necessary diagrams, Discuss in detail about the following:
   (a) Holographic recording materials.
   (b) Recording and reconstruction of fourier transform holograms.
7. (a) Explain in detail about laser applications in dermatology.
   (b) List out various laser instruments used for surgery. Briefly give their working principle.
8. (a) Explain with relevant diagrams the basic principle of confinement of carriers optical power in the active region of a double hetrojuntion LED.
   (b) Discuss different modulation drive circuits for LED s and explain their operation.

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