Total No. of Questions : 8] [Total No. of Printed Pages : 2

Roll No. .....

MEDC–302(A)

M. Tech. (Third Semester) EXAMINATION, Feb., 2010

OPTICAL INSTRUMENTATION AND MEASUREMENT

[MEDC–302(A)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Discuss the sensitivity of OTDR in relation to commercial reflectometers. Also discuss the working of OTDR.

   (b) With the aid of block diagram explain the working of optical spectrum analyzer.

2. (a) Discuss the principle of operation of demountable optical fiber connector.

   (b) Sketch the major elements of a fiber amplifier and describe the operation of the device.

3. (a) Outline the technique that can be employed to provide directional coupling. Discuss the designing and working of direction coupler.

   (b) Explain the technique of WDM. Also draw an optical fiber system illustrating wavelength division multiplexing.

P. T. O.

4. Explain the designing of the following fiber optic sensors with the aid of a neat sketch :
   (i) temperature sensor
   (ii) pressure sensors

5. (a) Discuss with the aid of a suitable diagram the cut back technique used for the measurement of the total attenuation in an optical fiber.

   (b) Discuss with the aid of suitable diagrams the measurement of dispersion in optical fibres.

6. (a) Compare and contrast two simple techniques used for the measurement of the numerical aperture of optical fibers.

   (b) Define the mode field diameter in a single mode fiber and discuss the techniques which are commonly employed to measure the field diameter.

7. Explain the following in single mode fiber. Also discuss their measurement techniques :
   (i) Birefringences
   (ii) Propagation constant of fiber mode

8. Write short notes on any *two* of the following :
   (i) Beam splitters
   (ii) Fiber laser
   (iii) Fiber optic isolators
   (iv) Fiber optic strain sensor