Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.TECH(MCNT)/SEM-3/MC-303/2010-11

2010-11

OPTICAL NETWORKS

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any five questions.

1. a) What do you understand by a power splitters in optics ? 2

   b) What types of power splitters are generally used in optical networks ? 4

   c) Describe and explain any one type of power splitting device used in optical networks. 8

2. a) What is mode field diameter of an optical fiber ? 2

   b) What type of optical fibers are suitable for indoor installations ? 4

   c) What are the sources of loss in an optical fiber and how can loss be minimized ? 4

   d) Describe the characteristics of graded index polymer optical fiber. 4

3. a) Explain time division multiplexing in a passive optical network. 4

b) How is it different from a wavelength division multiplexing passive optical network ? Explain with block diagrams. 4 + 6

4. a) How is Bidirectinal Communication carried out in a fiber optical network ? 2

b) Describe the different methods of bidirectional transmissions. 12

5. a) What are OLT and ONU in an optical network ? 4

b) Describe the different categories of ONUs. 10

6. Write short notes on any *two* : 2 × 7

a) Array waveguide gratings as multiplexers / demulti-flexers.

b) Optical fiber curl cord.

c) Erbium doped fiber amplifier (EDFA).

d) Optical packet switching.

e) Vertical cavity surface-emitting laser (VCSEL) as ONU transmitter.

7. a) Why is ranging required in an optical network ? Explain. 4

b) Describe the role of ranging in an optical network with time division multiple access. 5

c) Write down different ranging procedures and ranging protocols. 5