(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 2886 **Roll No.** | | | | | | | | | | |

B.Tech.

(SEM. VIII) EVEN THEORY EXAMINATION 2012-13

OPTICAL NETWORKS

Time : 3 Hours *Total Marks : 100*

Note :– Attempt **all** questions. All questions carry equal marks.

1. Attempt any **four** parts of the following : **(5×4=20)**
   - (a) Derive the power transfer function of MZI.
   - (b) Explain the working principle of Bragg Gratings and Fiber Gratings.
   - (c) What are the various non-linear effects in optical fiber ?
   - (d) Explain optical packet switching in detail.
   - (e) Explain the reasons for growing demand of optical networks. What are the key network elements that enable optical networking ?
   - (f) What is the difference between circuit switching and packet switching ?
2. Attempt any **four** parts of the following : **(5×4=20)**
   - (a) State the principle of operation of Erbium Doped Fiber Amplifier. Why do we prefer only Erbium and not any other element for this amplifier ?
   - (b) What are Solitons ? How they are capable of reducing non-linear effects ? Explain.

(c) Explain sub-carrier modulation in detail.

(d) What do you mean by spectral efficiency ? What are the various modulation techniques to increase spectral efficiency ?

(e) Explain all interferometric techniques of wavelength conversion.

(f) What is crosstalk ? Explain the various methods to reduce crosstalk in optical switches and multiplexers.

3. Attempt any **two** parts of the following : **(10×2=20)**

(a) Explain SONET/SDH frame structure in detail. Why 51.84 Mbps rate is used as the basic transmission rate in SONET/SDH ? What is grooming ?

(b) What is Ethernet ? Explain Ethernet frame structure.

(c) What do you mean by reconfigurability ? How many different types of reconfigurable OADM architectures are there ? Explain.

4. Attempt any **two** parts of the following : **(10×2=20)**

(a) How can we dimension wavelength routing networks in a WDM network ? Compare path, span and ring switching in WDM networks with diagram.

(b) Briefly explain network architecture overview in reference to optical network. Compare UPSR, BLSR/2, BLSR/4.

(c) What is a light path ? What are the various light path topologies used in WDM networks ?

5. Attempt any **two** parts of the following : **(10×2=20)**

(a) Comment on deployment considerations in optical networks.

(b) Explain the OTDM and Buffering functions performed by photonic packet switched networks.

(c) Draw a block diagram of packet switched network. Explain Routing, Forwarding, Switching, Buffering, Multiplexing and Synchronization.