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

PAPER ID : 131851   Roll No.

B.Tech.

(SEM. VIII) THEORY EXAMINATION 2013-14

OPTICAL NETWORKS

Time : 3 Hours   *Total Marks : 100*

Note :– (1)   Attempt all questions.

(2)   Each question carries equal marks.

(3)   Assume data wherever missing.

1. Attempt any **four** of the following :   (5×4=20)

(a)   Write a short note on Timing and Synchronization in Optical Networks.

(b)   Explain various Non-linear effects in Optical Fiber.

(c)   Explain Layered Hierarchy of the Optical Layer.

(d)   How is Multiplexing done in Optical Networks ?

(e)   Discuss in brief any three Nonlinear effects present in optical fiber.

(f)   Discuss wavelength standards used in optical networks. Relate Wavelength, Frequencies, and Channel Spacing.

2. Attempt any **four** of the following :   (5×4=20)

(a)   How directional couplers are realized using optical fiber. Calculate its coupling coefficient.

(b) Explain in brief the various types of switches used in Optical Networks on the basis of response to incoming signals.

(c) With relevant figure discuss the working and principle of operation of Isolator.

(d) Give an account of the various architectures used for building Large Optical Switches.

(e) Explain principle of operation and working of Fiber Grating. Mention its two applications.

(f) Write short notes on :

(i) Spectral efficiency

(ii) Crosstalk

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

(a) Discuss Voice Over IP method of implementation in Optical Communication System.

(b) Which WDM Network element performs the Multiplexing and Demultiplexing operation in Optical Networks ? Explain it with the help of a diagram.

(c) What is Multiplexing in reference to SONET/SDH ? Give a brief account of SONET/SDH Layers with diagram.

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

(a) Write a short note on cast trade off in WDM network. Give an account of routing and wavelength assignment problem in optical networks.

(b) Identify different possible strategies for implementation of an access network and outline the functional blocks for an optical fiber access network to provide FTTC and FTTH.

(c) Explain the different types of protection mechanisms used for point to points links. Compare Self Healing Rings and Unidirectional Path-Switched Rings.

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

(a) What is photonic packet switched network. Discuss its salient features.

(b) Write notes on :

(i) OTDM

(ii) Burst switching.

(c) Discuss in detail, the deployment considerations for SONET/SDH core network.