

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

PAPER ID : 131851 Roll No.

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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.