

**TECH**  
**(SEM VIII) THEORY EXAMINATION 2017-18**  
**OPTICAL NETWORK**

Time: 3 Hours

Total Marks: 100

Note: 1. Attempt all Sections. If require any missing data, then choose suitably.

**SECTION A****Attempt all questions in brief.**

x 10 = 20

- a. Draw SDH frame structure.
- b. Write down two advantages of PNphotodiode.
- c. Give the important features of time-slotted optical TDM network
- d. What is OLT?
- e. What are the three topologies used for fiber optical network?
- f. What is total number of switches in CLOS Architecture?
- g. Write down differences between isolators and circulators.
- h. What is HDLC?
- i. What is meant by cross- phase modulation (XPM)?
- j. Why SONET/SDH protection has been so successful?

**SECTION B****2. Attempt any three of the following:**

10 x 3 = 30

- a. Explain briefly main categories of Nonlinear effects in Optical communication system.
- b. What are large optical switches? Give an account of various architecture used for building optical switches.
- c. Explain OADM and its architecture.
- d. Write a short note on network survivability with protection of client layer. Discuss the operation of interworking between layers.
- e. What is photonic packet switched network? Discuss its salient features.

**SECTION C****3. Attempt any one part of the following:**

10 x 1 = 10

- (a) Explain Layered hierarchy of optical layer.
- (b) Discuss optical packet switching and optical fiber communication over other communication

**4. Attempt any one part of the following:**

10 x 1 = 10

- (a) With relevant figure discuss the working and principle of operation of Isolator. How directional couplers are realized using optical fiber. Calculate its coupling coefficient.
- (b) Explain principle operation and working of Fiber Bragg Grating. Explain with Diagram. Mention application, advantages and disadvantages of fiber Bragg grating.

**5. Attempt any one part of the following:**

10 x 1 = 10

- (a) What is multiplexing in reference to SONET/SDH? Give a brief account of SONET/SDH layers with diagram
- (b) What is Framing techniques? Discuss IP routing and forwarding and QOS.

**Attempt any one part of the following:**

10 x 1 = 10

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

**Attempt any one part of the following:**

10 x 1 = 10

- (a) Write notes on:
  - (i) OTDM
  - (ii) Burst switching.
- (b) Discuss in detail, the deployment considerations for SONET/SDH core network