

**B 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**

- 1. Attempt *all* questions in brief. 2 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. Explains 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.
6. 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.
7. 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.