

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.

10 x 1 = 20

- a. Draw SDH frame structure.
- b. Write down two advantages of PN photodiode.
- 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.

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 cost 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.