

B.TECH.

THEORY EXAMINATION (SEM-VIII) 2016-17

OPTICAL NETWORKS

Time : 3 Hours

Max. Marks : 100

Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.

SECTION – A

1. Explain the following:

10 x 2 = 20

- (a) What do you understand by all-optical and opaque optical network?
- (b) Differentiate between circuit switching and packet switching.
- (c) Discuss the principle of operation of reflections grating.
- (d) What do you understand by multiplexer and filters in optical network?
- (e) What are point to point links in optical network?
- (f) What is SONET/SDH concatenation?
- (g) What are wavelength converters? Mentions their types
- (h) What are solitons? How they are capable of reducing the non-linear effects?
- (i) Explain gigabit and VLAN Ethernet frames.
- (j) How do we arrive at 51.84 Mbps basic transmission rate in SONET/SDH?

SECTION – B

2. Attempt any five of the following questions:

5 x 10 = 50

- (a) Explain the reasons for growing demand of optical networks. What are the key networks elements that enable optical networking?
- (b) Mention the advantages offered by optical amplifiers over regenerators. Explain principle of operation of EDFA.
- (c) Explain the structure and properties of VCSELs laser. Also tells about the different tuning mechanisms
- (d) Explain OTDM with a function of a bit interleaved optical multiplexer?
- (e) What do you understand by spectral efficiency? Explain about optical Duobinary modulation with the help of mathematical expression.
- (f) With a neat diagram, explain the OTN frame structure. Also explain OTN hierarchy in detail. Why is this hierarchy more elaborate than SONET/SDH?
- (g) Why SONET/SDH are called self healing. Explain the protection technique implemented in SONET/SDH rings?
- (h) Explain the functions performed by Routers in photonic packet switched (PPS) networks?

SECTION – C

Attempt any two of the following questions:

2 x 15 = 30

3. Differentiate between Light Path Topology(LTD) problem and Routing and Wavelength assignment problem(RWA). For a point to point WDM ring design topology, calculate design parameters required in determining and minimizing network cost?
4. Explain the optical switching on the basis of optical Cross Connect & Optical Burst Switching.
5. What are the different ways deployed for increasing transmission capacity in optical networks? Explain architectural choices for deploying next generations transport networks.