

Paper Id: 131618

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**B.TECH**  
**(SEM. VIII) THEORY EXAMINATION 2017-18**  
**OPTICAL NETWORKS**

**Time: 3 Hours****Total Marks: 100**

- Note:** 1. Attempt all Sections.  
2. Assume any missing data.

**SECTION A**

- 1. Attempt all questions in brief. 2 x 10 = 20**
- a. Name the two examples of first generation optical networks.
  - b. What are the basic characteristics of a filter?
  - c. What are Solitons? What is their advantage?
  - d. What is Crosstalk in SOA?
  - e. What is an optical add/drop multiplexer?
  - f. What is the significance of WDM in optical networks?
  - g. List the different topologies used in optical networks.
  - h. Mention advantages of WDM. What are their types?
  - i. Define full wavelength conversion.
  - j. Why SONET/SDH protection has been so successful?

**SECTION B**

- 2. Attempt any three of the following: 10 x 3 = 30**
- a. Explain layered hierarchy of optical layer.
  - b. Explain the function & the Principle of operation of Wavelength Converters?
  - c. Describe the frame structure and network configurations defined for SONET and SDH with diagrams.
  - d. Explain the types of WDM in detail.
  - e. What is a photonic packet switched network? Discuss its salient feature.

**SECTION C**

- 3. Attempt any one parts of the following: 10 x 1 = 10**
- a. Explain various non-linear effects in optical fiber. How is Multiplexing done in optical networks?
  - b. Explain the principle of operation of Fabry Perot (FP) filter and Mach Zehnder Interferometer (MZI)?
- 4. Attempt any one parts of the following: 10 x 1 = 10**
- a) Explain in detail the various types of switches used in optical Networks on the basis of response to incoming signals.
  - b) Discuss Tunable Lasers and Spectral efficiency.
- 5. Attempt any one parts of the following: 10 x 1 = 10**
- a) With the help of block diagram explain optical line amplifiers in detail.
  - b) How does an optical cross connect work? Explain.

**6. Attempt any one parts of the following:**

**10 x 1 = 10**

- a) Explain in detail Network management and Protection architectures of SDH.
- 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.

**7. Attempt any one parts of the following:**

**10 x 1 = 10**

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