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Paper Id: **131618**   Roll No. [_____]

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 x10 = 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