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(2063)

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M.Tech 2nd Semester Examination

Design of Optical Networks Systems

EC-201

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary continuation sheet will be issued.

Note : Attempt any five questions. Assume any missing data.

1. (a) With neat diagram explain the design objectives and construction of Optical Networking.

   (b) Mention the advantages and disadvantages of optical communication systems. **(12,8)**

2. (a) List major causes of dispersion in an optical fiber & Explain their mechanism,

   (b) Explain the principle of operation of a semiconductor optical amplifier? Briefly describe the crosstalk in SOAs. **(10,10)**

3. (a) Show the structure of an EDFA & Explain the function of each component. Explain how stimulation emission occurs in an EDFA.

   (b) What is the function & the principle of operation of an isolator? Give applications of isolator. **(10,10)**

4. (a) What are optical cross connects. Explain the function of optical cross connects.

   (b) Explain about nonlinearity effects in a fiber. **(10,10)**

5. (a) Explain the principle of operation of Fabry Perot (FP) filter?

   (b) Describe the principle of operation of Mach Zehnder Interferometer (MZI)? **(10,10)**

6. What are the advantages of SONET/SDH over PDH? Explain the functional block diagram of the SONET/SDH Multiplexing? Briefly describe the functions, service of the SONET layer. Explain the elements of SONET/SDH infrastructure? **(20)**

7. (a) Define Add/Drop Multiplexer?

   (b) Why do we need to develop WDM fiber optic network? Why is WDM the major trend in Fiber optic network? **(10,10)**

8. Write short note on the following:

   (i) Optical layer

   (ii) Optical line terminals

   (iii) Bragg grating

   (iv) Soliton **(5×4=20)**