



10TE81

Eighth Semester B.E. Degree Examination, Feb./Mar. 2022

Optical Networking

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Differentiate between private and public networks. Explain different parts of a public network with a neat sketch. (08 Marks)
b. Explain the services offered by a second generation optical networks. (06 Marks)
c. What are solitons? Explain the significance of solitons for optical communication give an application. (06 Marks)
- 2 a. Explain the principle of operation of Bragg Gratings. With a neat diagram, explain optical add/drop element based on fiber bragg grating. (10 Marks)
b. With a neat diagram, explain the working of a Semiconductor Optical Amplifier (SOA). Discuss the cross talk phenomenon in SOA's. (10 Marks)
- 3 a. Explain the working of pin photodiodes. What is the limitation of pin photodiode and how avalanche photodiodes overcome the limit? (10 Marks)
b. Describe the important parameters used to characterize the suitability of a switch for optical networking applications and explain electro-optic directional coupler switch with a neat diagram. (10 Marks)
- 4 a. Discuss several forms of dispersion arise in optical communication systems and explain how chromatic dispersion is compensated using chirped fiber bragg gratings. (10 Marks)
b. Describe power penalty. Explain the key system design parameters related to the transmitter and receiver. (10 Marks)

PART – B

- 5 a. Explain the hierarchical multiplexing structure employed in SONET/SDH. Give detailed mapping of lower-speed streams into VT's and higher rate singles (STS-N). (10 Marks)
b. Write short notes on: (i) ESCON (ii) FDDI (10 Marks)
- 6 a. Explain different types of wavelength conversion that may be realized in a node. (10 Marks)
b. Discuss the traffic models commonly employed to study optical networks. (10 Marks)
- 7 a. Describe different types of protection mechanisms that are used for simple point-to-point links. Explain how line switching is implemented in a mesh network. (10 Marks)
b. Explain different scenarios for the virtual topology design problem. (10 Marks)
- 8 a. Discuss the architecture of an access network. Explain the two main approaches proposed to upgrade the access network infrastructure. (10 Marks)
b. With a neat diagram, explain how bit interleaving multiplexing and demultiplexing operations are performed in OTDM. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.