

**Roll No.**

**Total No. of Pages : 02**

**Total No. of Questions : 08**

**M.Tech.(ECE) (2018 & Onward Batch) (Sem.-1)**

# OPTICAL NETWORKS

**Subject Code : MTEC-PE1X-18-2**

**M.Code : 75175**

**Time : 3 Hrs.**

**Max. Marks : 60**

### INSTRUCTIONS TO CANDIDATES :

**1. Attempt any FIVE questions out of EIGHT questions.**

**2.Each question carries TWELVE marks.**

1.
  - a) What are SONET and SDH? Explain benefits of SONET and SDH as compared to PDH. 6
  - b) What is ATM? Explain the advantages of ATM? Also discuss the functions of ATM? 6
2.
  - a) Which sublayer within the SONET or optical layer would be responsible for handling the following functions? 4
    - i) A SONET path fails and the traffic must be switched over to another path.
    - ii) Many SONET streams are to be multiplexed onto a higher stream and transmitted over a SONET link.
    - iii) The error rate on a sonnet link between regenerators is to be monitored.
    - iv) The connectivity of an STS-1 stream through a network needs to be verified.
  - b) Explain the different architectures of OADM. Compare them in the context of channel constraints, traffic changes, wavelength planning, loss and cost. 8
3.
  - a) What are the different functions of network management? How network management functions are implemented on a typical network? 6
  - b) Discuss the various services provided by optical layer. 6

4. a) Explain the following performance and fault management parameters : 6
  - i) BER Measurement
  - ii) Optical Trace
  - iii) Optical layer overhead
- b) What is optical safety? Why is it important? Discuss the different issues related to optical safety. 6
5. a) What are the different types of self-healing rings? Compare their performances. 6
- b) Why optical layer protection is done? Discuss at least two optical layer protection schemes. 6
6. a) Discuss the LTD and RWA problems. Explain lightpath topology design briefly. 6
- b) What are statistical dimensioning models? Explain any one model in detail. 6
7. a) What is access network? Explain the architecture of an access network. 6
- b) Write a short note on GPON and AON. 6
8. a) Discuss the issues related to optical time division multiplexing and synchronization. 6
- b) Write short note on **any two** of the following :
  - i) Internet protocol 3
  - ii) Multi-protocol label switching 3
  - iii) Optical cross connects 3

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**