Reg. No. : | | | | | | | | | | | | |

# Question Paper Code : X 67575

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Seventh Semester
Electronics and Communication Engineering
EC 1401 – OPTICAL COMMUNICATION AND NETWORKS
(Regulations 2008)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Write the major differences between first and second generation optical networks.
2. Write the application of couplers and isolators.
3. Show how an ATM over SONET network is realised.
4. What is known as light path ?
5. What is meant by WDM ? Draw the basic components of a WDM link.
6. Mention the network topologies and their features applicable for broadcast and select network.
7. What is known as grooming in wavelength routing networks ?
8. List any four wavelength routing test beds.
9. What is the basic difference between broadcast and switch – based networks ?
10. List out the functions performed by a router in optical TDM networks.

PART – B **(5×16=80 Marks)**

11. a) i) Briefly explain the key features in the evolutional process of I generation to II generation optical network and beyond. **(12)**

ii) Explain fiber losses due to attenuation and dispersion. **(4)**

(OR)

b) i) State the importance of optical filters in channel selection. Explain the basic classification of optical filters and their features. **(10)**

ii) What is the role of isolators and circulators in optical transmission ? **(6)**

12. a) i) Explain the multiplexing scheme used in SONET/SDH with relevant diagrams. **(10)**

ii) Compare and contrast SONET/SDH and plesiochronous digital hierarchy. **(6)**

(OR)

b) With necessary diagrams, discuss in detail about the frame structure used in SONET/SDH.

13. a) i) Explain the topologies for broadcast networks. Draw the internal structure of a star coupler. **(8)**

ii) Draw the architecture and explain the Rainbow and STARNET test beds. **(8)**

(OR)

b) i) Describe how synchronization is achieved for frame/slot in MAC protocol. **(8)**

ii) Explain the protocol that is specifically designed for multi wavelength optical networks among all MAC protocols. **(8)**

14. a) i) Draw and explain wavelength cross connects with and without wavelength conversion. **(8)**

ii) Explain the issues in the design and operation of wavelength routing networks. **(8)**

(OR)

b) i) Explain the online RWA approaches and the factors governing wavelength reuse. **(10)**

ii) Write a brief note on NTT test bed. **(6)**

15. a) i) Explain the principles of TDM and WDM. Specify the applications of both techniques. **(8)**

ii) Explain the deflection routing technique in switch based networks. **(8)**

(OR)

b) Explain the multiplexing and demultiplexing concepts of OTDM. Also, explain the working principles of various components involved in MUX and DEMUX. **(16)**

———————