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

Question Paper Code : 21196

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

Seventh Semester

Electronics and Communication Engineering

EC 1401 — OPTICAL COMMUNICATION AND NETWORKS

(Regulation 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 applications of couplers and isolators.
3. What are the functions of path overhead bytes of SONET frames?
4. Write the difference between STS-3 and STS-3c signals.
5. Mention the advantages and applications of broadcast and select networks.
6. Write the salient features of Lambdanet.
7. What are the functions performed by the nodes of wavelength routing networks?
8. What are the functions performed by the optical layer?
9. List the technical challenges in the implementation of OTDM.
10. Distinguish bit and packet interleaving.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the principle of operation and applications of Mach-Zehnder interferometer and arrayed waveguide grating with suitable diagrams. (12)

(ii) List the advantages, disadvantages and applications of semiconductor optical amplifiers. (4)

Or

(b) (i) Describe how cross phase modulation and four wave mixing are utilized in wavelength converters with neat diagrams. (10)

(ii) Compare the different switch architectures. (6)

12. (a) (i) Draw and explain the SONET network elements and topologies. (10)

(ii) Explain the hierarchical multiplexing structure used in SONET. (6)

Or

(b) (i) Describe the different SONET rings with neat diagrams. (10)

(ii) Discuss the importance of network management. (6)

13. (a) (i) Describe the broadcast and select networks using bus and star topologies. (8)

(ii) Describe how frame/slot synchronization is achieved in broadcast and select networks. (8)

Or

(b) (i) Explain the scheduling protocols used in broadcast and select networks. (8)

(ii) Describe the starnet and lightning test beds with neat diagrams. (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 operation of optical multiplexer and demultiplexer for packet interleaved TDM streams with neat diagrams. (8)

(ii) Write a brief note on optical AND gates. (8)

Or

(b) (i) Explain the functions performed by the routing node of a photonic packet switched network. (8)

(ii) Draw and explain tunable, feed-forward and feedback delay lines. (8)
