

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**Question Paper Code : 61212**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 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. State the difference between first and second generation optical networks.
2. List the key characteristics of optical filters relevant to communication systems.
3. What are the different types of network configurations in which SONET/SDH is deployed?
4. Why ring topology is widely used in SONET/SDH networks?
5. State the key difference between single-hop and multi-hop networks.
6. What is the mean hop distance for a shufflenet of size  $(p,k)$ ?
7. What is meant by wavelength routing network?
8. List out the physical layer components of a wavelength routing network.
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) With neat sketches, explain the structure and principle of operation of optical
- (i) Directional coupler and (8)
  - (ii) Isolator. (8)

Or

- (b) Explain with necessary diagrams, the principle of EDFA and its application in optical networks.
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) Explain any two MAC protocols used for single-hop broadcast and select networks.

Or

- (b) Discuss about the experimental testbeds available for broadcast and select networks.
14. (a) Illustrate the cost — tradeoffs associated the design of wavelength routed networks with an example.

Or

- (b) Explain with examples, the routing and wavelength assignment problem in wavelength routed networks.
15. (a) Explain how synchronization is achieved in OTDM networks. Also state its significance.

Or

- (b) Discuss in detail about OTDM testbeds.