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**Question Paper Code : 41228**

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

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 principle of Fabry Perot filter.
2. What is AWG?
3. Distinguish between SDH and SONET.
4. What is virtual tributary?
5. What is a selective repeater?
6. Define : Collision and Contension.
7. What is known as grooming in wavelength routing networks?
8. List any four wavelength routing test beds.
9. What is the need for synchronization?
10. Define : Packet interleaving.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw and explain the principle of operation of a 3-dB directional coupler. (8)
- (ii) Describe with energy level diagram and gain characteristics of EDFA. (8)

Or

- (b) (i) Draw the Mach – Zehnder Interferometer and explain its working principle. Show the transfer functions of a multistage MZI. (8)
- (ii) Describe the application of Cross-phase modulation in the wavelength conversion. (8)

12. (a) (i) Explain in detail the layered architecture of SONET. (8)  
(ii) Show the different SONET configurations of a SONET infrastructure and explain in detail its DCS. (8)

Or

- (b) (i) What are Alarms? What are the different types of protection techniques for a point – to – point link? (8)  
(ii) Describe the overview of network management in a typical optical network. What are the various functions of network management? Explain. (8)
13. (a) Explain the SA/SA protocol in detail. What are its limitations? How they are overcome in the modified SA/SA protocol? And also compare and analyse the throughputs. (16)

Or

- (b) Describe in detail with their diagrams the following test beds.  
(i) STARNET  
(ii) BBC Television Studio. (8+8)
14. (a) (i) What are the various types of wavelength conversions involved in wavelength routing networks? Explain. (8)  
(ii) Show how WXC nodes can be realized in different methods and explain them. (8)

Or

- (b) Explain in detail the Routing and wavelength assignment algorithms. (16)
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)