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Question Paper Code: 52222

M.E. DEGREE EXAMINATION, JUNE 2016

Second Semester

Communication Systems

15PCM202 - OPTICAL NETWORKS

(Regulation 2015)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. A directional coupler is

    (a) 2 port device   (b) 3 port device
    (c) 4 port device   (d) multiport device

2. What does SONET and ATM stand for?

    (a) Synchronous On-line Network and Asynchronous Transfer Machine
    (b) Synchronous Optical Network and Asynchronous Transfer Mode
    (c) Operator Network and Automated Timing Machine
    (d) System Operator Network and Asynchronous Transfer Machine

3. Which layer links the network support layers and user support layers?

    (a) Session layer   (b) Data link layer
    (c) Transport layer   (d) Network layer

4. Header of a frame generally contains

    (a) Synchronization bytes   (b) Addresses
    (c) Frame identifier   (d) All the above

5. What are the major differences between an access network and a transport network?

    (a) The access network has a higher survivability than a transport network

    (b) The restoration process they employ and the cost associated with their implementation

    (c) The amount of traffic they handle and the unit of traffic they administer

    (d) There are no differences , they are exactly the same

PART B - (5 x 3 = 15 Marks)

6. What are the functions of couplers and isolators in an optical network?

7. Discuss the main features and mode of operation of broadcast and select networks.

8. What are the problems encountered in routing and wavelength assignment?

9. How does label switching differ from IP forwarding? Explain the advantages of switching.

10. Explain the topologies related to configuration management.

PART C - (5 x 16 = 80 Marks)

11. (a) Write short notes on

    (a) Optical line terminals   (b) Couplers

    (c) Add/Drop multiplexers   (d) Filters   (16)

Or

(b) (i) What is the function and the principle of operation of an isolator and circulator? Give example of isolator and circulators applications. (8)

(ii) Explain the principle of operation of a Semiconductor Optical Amplifier (SOA). Show the structure of an EDFA and explain the function of each component. (8)

12. (a) (i) Explain about the SONET/SDH frame structure. (6)

(ii) Explain in detail about any 2 test beds used in wavelength routed networks. (10)

Or

(b) (i) Explain the optical network layered architecture with a necessary sketch. (6)

(ii) Discuss the main features and mode of operation of broadcast and select networks. Discuss about the design issues. (10)

13. (a) (i) Explain in detail the issues in network design of wavelength routing networks and optical layer cost tradeoffs. (8)

(ii) Explain with an example node design in wavelength routed networks. (8)

Or

(b) (i) Explain the wavelength routing architecture with a relevant sketch. (8)

(ii) With neat diagram explain any two wavelength routing test beds. (8)

14. (a) (i) Describe in detail about the architecture and classification of different types of fiber access networks. (8)

(ii) Explain the OTD multiplexing and demultiplexing in photonic packet switching networks. (8)

Or

(b) (i) Explain the significance and essential circuits of future access network. (8)

(ii) Explain the principle of photonic packet switching with an example. Bring out the advantages of photonic packet switching over electronic switching circuits. (8)

15. (a) (i) Explain in detail network management and protection architectures of SDH. (8)

(ii) Discuss in detail about the equipment, connection and adaptation management functions of configuration management. (8)

Or

(b) (i) Describe how synchronization is achieved using tunable delays and optical phase lock loop. (8)

(ii) Explain in detail network management and protection architectures of synchronous optical networks. (8)

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