M.E. DEGREE EXAMINATIONS: JANUARY 2009

First Semester

COMMUNICATION SYSTEMS

P07CM103 Optical Communication Networks

Time: Three Hours   **Maximum Marks : 100**

Answer ALL Questions:-

PART A (20 x 1 = 20 Marks)

1. An _____ network is typically a long haul network that interconnects cities or major traffic hubs.

    A. Local-exchange network
    C. Interexchange network
    B. Public network
    D. Private network

2. In fixed multiplexing, the bandwidth of all the virtual circuits on a link must _____ the link bandwidth.

    A. less   B. equal   C. high   D. exceed

3. The pumping process is more efficient, i.e, uses _____ pump power for a given gain, at _____ than these other wavelengths.

    A. high, 1480nm   B. high, 980nm   C. less, 1480nm   D. less, 980nm

4. Example for reciprocal device

    A. Isolators   B. Couplers   C. Circulators   D. Switches

5. _____ layer deals with the transport of the pathlayer payload and its overhwead across the physical medium.

    A. Path   B. Line   C. Section   D. Physical

6. STS-1 SPE consists of _____ bytes.

    A. 783   B. 873   C. 874   D. 784

7. ADM is a _____ that can multiplex or demultiplex vatious signals to or from an OC-N signal.

    A. STE   B. LTE   C. PTE   D. MTE

8. SONET Frame has ____ rows and _____ columns of bytes with a total of ____ bytes.

    A. 90, 9, 810   B. 90, 9, 8000   C. 9, 90, 8000   D. 9, 90, 810

9. Which one of the following is not a Broadcast and select network testbed?

    A.NTT   B. Lambdanet   C. Rainbow   D. AfricaONE

10. Maximum propagation delay from any node to star in MAC protocol is _____.

A. $d_{prop} * 2$ B. d_{prop} C. $d_{prop}/2$ D. $d_{prop}/4$

11. Two most popular topologies for broadcast and select networks are

A. Ring & mesh   B. Star & Bus   C. Ring & bus   D. Ring & star

12. The _____ is defined as the delay between the time at which a packet is available for transmission at a node and the time at which it is first transmitted.

A. Propagation delay   B. Access delay
C. Queuing delay   D. Transmission delay

13. Key element in the wavelength routing network is _____.

A. WXC   B. Optical ADM   C. ADM   D.Regenerator

14. Topology of a wavelength routing network is _____.

A. Ring   B. Bus   C. Star   D. Arbitrary mesh

15. Which one of the regeneration technique essentially produces a fresh copy of the signal at each regeneration step?

A. 1R   B.4R   C. 2R   D. 3R

16. _____ is the process aligning two pulse streams in time.

A. Synchronization   B. Delay   C. Tunable delay   D. Fixed delay

17. In Routing and wavelength assignment, an undirected edge can represent a _____ fiber link with transmission in _____ directions over a single fiber.

A. Bidirectional, both   B. Bidirectional, only one
C. Unidirectional, both   D. Unidirectional, only one

18. BT lab testbeds using _____multiplexing.

A. byte interleaved   B. bit interleaved
C. packet interleaved   D. string interleaved

19. TBONE testbed using _____ topology

A. Star   B. Bus   C. Crossbar   D. Mesh

20. _____ achieved by using a fiber of the appropriate length.

A. Throughput   B. Synchronization   C. Delay   D. No.of Hops

PART B (5 x 16 = 80 Marks)

21. (a) (i) Compare Regenerators and Amplifiers. (8)

    (ii) Discuss about construction, principle of operation and pumping Details of EDFA. (8)

(OR)

21. (b) (i) List out the Optical fiber components. Explain the principle of operation of Isolators. (10)

    (ii) List out the important parameters that are used to characterize the suitability of a switch for optical networking applications. (6)

22. (a) (i) Draw the neat sketch of SONET frame structure. (8)

    (ii) Explain about SONET STS-1 SPE. (8)

(OR)

22. (b) (i) Define SONET Network elements. Explain about any two of SONET network elements (12)

    (iii) Compare UPSR and two fiber BLSR. (4)

23. (a) Explain about MAC protocol and its synchronization details.

(OR)

23. (b) (i) Compare Slotted Aloha/Slotted Aloha Protocol over DT-WDMA. (6)
    (ii) Explain any 2 of the broadcast and select network testbeds. (10)

24. (a) Discuss in detail about wavelength routing network node designs.

(OR)

24. (b) (i) Write short notes about the optical layer features. Compare Optical and electronic WXC. (8)

    (ii) Write short notes about Routing and wavelength assignment problem.(8)

25. (a) Write short notes about (1) Buffering (2) Deflection routings of switch based networks.

(OR)

25. (b) (i) Discuss about OTDM synchronization. (8)

    (ii) Compare SDM/TDM over WDM approach. (8)

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