

Roll No.

Total Pages : 3

BT-7/D09

8917

BROADBAND COMMUNICATION

(2006-07)

Paper : IT-453

Time : Three Hours]

[Maximum Marks : 100

Note : Attempt *five* questions in all, selecting at least *one* question from each unit.

UNIT-I

1. (a) Compare the guided optical fibre communication system with unguided radio and microwave communication system. 4
- (b) Explain the following terms :
 - (i) Dispersion shifted fibres.
 - (ii) Rayleigh scattering.
 - (iii) Leaky modes.
 - (iv) Mode coupling losses. 12
- (c) A 10 km optical fibre link without repeaters uses multimode graded index fibre which has a bandwidth length product of 400 MHzkm. Estimate (i) the total pulse broadening on the link, and (ii) the rms pulse broadening on the link. It may be assumed that a NRZ code is used. 4
2. (a) Describe the absorption losses in optical fibres, comparing and contrasting the intrinsic and extrinsic absorption mechanisms. 8

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[P.T.O.]

- (b) What is Multipath distortion in optical fibres ?
How does it affect the bandwidth distance product ?
Explain how this figure can be improved. 8
- (c) Draw a neat graph, showing combined losses in the fibre. 4

UNIT-II

3. (a) Using suitable diagrams, explain the working principle of short and coupled cavity lasers. 10
- (b) Describe the amplification mechanism of erbium-doped fibre amplifier with the help of a suitable diagram. 10
4. (a) Explain the working of Silicon Reach through Avalanche Photodiode. What are the advantages and disadvantages of APD over PIN photodiode ? 10
- (b) Describe the Optical packet switching and Optical burst switching employed in optical networks. 10

UNIT-III

5. (a) With the help of a suitable diagram, explain the ISDN architecture. Also, enumerate the lower layer transmission facilities to which ISDN provides access. 10
- (b) Describe how logical channels providing bearer services are organized for transmission over the local loop in ISDN. Also, explain the ISDN channel functions. 10

6. (a) With the help of a suitable diagram, explain the call negotiation procedure in ISDN-ISDN interworking.

10

(b) Describe the ISDN primary rate user-network interface by giving their frame formats. What are the percentage overheads in these interfaces ?

10

UNIT-IV

7. (a) Explain the concept of ATM. How are the limitations of synchronous TDM overcome in ATM ?

12

(b) An ATM switch has 1024 input lines and 1024 output lines. The lines operate at the SONET rate of 622 Mbps, which gives a user rate of approximately 594 Mbps. What aggregate bandwidth does the switch need to handle the user load ? How many cells per second must it be able to process ?

8

8. Explain the following :

(i) ATM switching principle.

(ii) ATM adaptation layer functions.

10+10