

*Time allowed : 3 hours]**[Maximum marks : 80*

**Note:** *Question No. - 1 is compulsory. Attempt four questions by selecting one question from each unit.*

*All questions carry equal marks.*

1. Answer the following : 8 × 2 = 16
- (i) Why is it necessary to limit the band of a signal before performing sampling ?
  - (ii) Name two well known data transport protocols provided by the Internet Transport Layer.
  - (iii) What do you understand by protocol hierarchies ?
  - (iv) Out of the three digital-to-analog modulation techniques, which one requires higher bandwidth ?
  - (v) How Manchester encoding helps in achieving better synchronization ?

- (vi) What are bridges ? Outline their significance.
- (vii) Why does impulse noise have more effect on digital signals rather than on analog signals ?
- (viii) What are the possible digital-to-analog modulation techniques ?

#### Unit - I

2. (i) What is an IP packet ? What is the minimum overhead in sending an IP packet using PPP ? Count only the overhead introduced by PPP itself, not the IP header overhead. 8
- (ii) What is OSI reference model ? Illustrate the model by detailing out all-important features. 8
3. (i) What is 'Network Topology' ? What are various types of network topologies ? Discuss benefits and limitations of these topologies over one another. 10

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- (ii) What do you mean by X.25 ? How does it work ?  
Illustrate its significance. 6

## Unit - II

4. (i) What are transmission errors ? How are these detected and corrected ? Illustrate. 7
- (ii) Differentiate between the following : 9
- (a) Analog and Digital Signals
- (b) Base-band and Broad-band transmission
- (c) Synchronous and Asynchronous transmission
5. (i) What is data encoding ? Illustrate the difference between Manchester and differential encoding.  
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- (ii) What is bandwidth of a channel ? Discuss the main factors on which channel's bandwidth depends. 5
- (iii) What is multiplexing ? List different types of multiplexing techniques possible for signals and outline the working of each. 6

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## Unit - III

6. (i) What do you understand by FDDI ? Discuss its objectives, relevance and usefulness. 8
- (ii) What are sliding window protocols ? What are the advantages and disadvantages of credits versus sliding window protocols ? Explain. 8
7. Explain the following :
- (i) Random Access Protocols 6
- (ii) Token Ring 5
- (iii) Gateways 5

## Unit - IV

8. What do you mean by routing ? What are its objectives ? What are different routing algorithms ? Discuss pros and cons of the major routing algorithms. 16
9. Explain the following :
- (i) Congestion control mechanisms 8
- (ii) TCP/IP protocol architecture 8

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