B.C.A., 5th Semester Examination,

February-2022

DATA COMMUNICATION AND

NETWORKING

(BCA-303)

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

(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) Basc-band and Broad-band transmission

(c) Synchronous and Asynchronous transmission

5. (i) What is data encoding ? Illustrate the difference between Manchester and differential encoding.
 5

(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

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