2023

(May/June)

COMPUTER SCIENCE

(Elective/Honours)

(Data Communication and Computer Networks)

(CS–401T)

Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. *(a)* Discuss the uses of computer networks. 3

(b) Discuss the similarities and dissimilarities between OSI and TCP/IP reference models. 6

(c) Write short notes on FDM and TDM. 2+2=4

(d) A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is $x^3 + 1$. Show the actual bit string transmitted. Suppose the third bit from the left is inverted during transmission, show that this error is detected at the receiver's end. 3+2=5

2. (a) Explain the characteristics of a sliding window protocol. Distinguish between go-back-*n* and selective-repeat variations of the sliding window protocol. 2+3=5

(b) What are the advantages of using a Star topology over a Bus topology while constructing a LAN? 5

(c) Explain any three framing techniques with suitable examples. 6

(d) What is error control? 2

UNIT—II

3. (a) Discuss Distance Vector Routing algorithm with the help of an example. 6

(b) What is Count-to-Infinity problem and how is it overcome? Briefly explain the core concept of Flooding algorithm. 3+2=5

(c) How does the Leaky Bucket algorithm achieve traffic shaping? 4

4. (a) What is the difference between congestion control and flow control? 3

(b) Describe routing for mobile hosts with a suitable diagram. 8

(c) Explain the IPv4 addressing scheme. 4

UNIT—III

5. (a) Explain the process of connection establishment in case of TCP. 4

(b) Instead of using UDP, explain why it would not be enough to just let the user processes send raw IP packets. 3

(c) Explain the different multiplexing in transport layer. How is multiplexing involved in transport layer different from that used in physical layer? 5+2=7

6. (a) Explain the flow control and buffering elements of transport protocols. 3+3=6

(b) Explain the TCP transmission policy. 5

(c) Write a short note on crash recovery in transport layer. 3

UNIT—IV

7. (a) What is electronic mail? Explain the two scenarios of architecture of E-mail. 2+5=7

(b) What is DNS? Explain its usage and its working. 2+5=7

8. *(a)* Discuss the mail delivery using POP3. Contrast it with IMAP. 3+2=5

(b) Write a short note on persistent and non-persistent HTTP connections. 5

(c) Write a short note on FTP. 4

UNIT—V

9. *(a)* Differentiate among static, dynamic and active documents used in World Wide Web. 6

(b) Write short notes on the following : 3+3=6

(i) IIS

(ii) Apache

(c) What is a Web browser? 2

10. *(a)* Write a short note on W3C recommendations. 6

(b) With the help of suitable examples, explain the Uniform Resource Locator (URL) formats. 6

(c) What is the purpose of HTML? 2

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