



SUPPLEMENTARY SEMESTER EXAMINATIONS – AUGUST 2019

Course & Branch	: B.E. : Computer Science and Engineering	Semester	: IV
Subject	: Data Communication	Max. Marks	: 100
Subject Code	: CS44/CS1544	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT- I

- Illustrate with a neat diagram the data communications system components and discuss the characteristics that it should possess. CO1 (10)
 - Discuss the different network topologies along with advantages and disadvantages of each topology. CO1 (10)
- Why is layering important? Provide the layer structure of TCP/IP protocol suite and discuss the working principle of each layer. CO1 (08)
 - Examine the facts causing transmission impairment. Explain each one in detail. CO1 (08)
 - A network with bandwidth of 10Mbps can pass only an average of 12000 frames per minute with each frame carrying an average of 10,000 bits. Compute the throughput of the network? CO1 (04)

UNIT- II

- Explain various techniques of Digital to analog conversion techniques CO2 (06)
 - Explain Delta Modulation with a neat figure. CO2 (06)
 - Draw the graph of the Manchester, Differential Manchester, using each of the following data streams, assuming that the last signal level has been positive: CO2 (08)
i) 00000000 ii) 11111111 iii) 01010101 iv) 00110011
- Explain Time Division multiplexing. Two channels, one with a bit rate of 100 kbps and another with a bit rate of 200 kbps, are to be multiplexed. How this can be achieved? Find the frame rate, frame duration and the bit rate of the link? CO2 (08)
 - Explain the scrambling techniques with examples. CO2 (08)
 - Draw the graph of the MLT-3 scheme using each of the following data streams, assuming that the last signal level has been positive CO2 (04)
i) 01010101 ii) 00110011

UNIT- III

- A three-stage space-division switch with $N = 100$. Use 10 crossbars at the first and third stages and 4 crossbars at the middle stage. CO3 (07)
 - Draw the configuration diagram
 - Calculate the total number of crosspoints.
 - Find the possible number of simultaneous connections.
 - Find the possible number of simultaneous connections if we use a single crossbar (100 X 100).
 - Find the blocking factor
 - Redesign the configuration using the Clos criteria and calculate total number of crosspoints.
 - Explain the 3 phases of virtual circuit network with an example. CO3 (08)
 - Draw the flowchart to calculate an 8-bit Fletcher checksum. CO3 (05)

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6. a) Define Cyclic Code and explain with neat block diagrams CRC encoder and decoder. CO3 (08)
b) Given the dataword 101001111 and the divisor 10111, show the generation of the CRC codeword at the sender site and syndrome values at the receiver site. CO3 (06)
c) Referring to the CRC-16, $x^{16}+x^{12}+x^5+1$ answer the following questions: CO3 (06)
i) Does it detect a single error? Defend your answer
ii) Does it detect a burst error of size 6? Defend your answer.
iii) What is the probability of detecting a burst error of size 9?
iv) What is the probability of detecting a burst error of size 15?

UNIT- IV

7. a) Discuss the control field format for different types of HDLC frames. CO4 (10)
b) With a neat flow diagram explain the working of CSMA/CD. CO4 (10)
8. a) Differentiate between Bit stuffing and Byte stuffing with examples. CO4 (06)
b) Draw the FSM for Go-Back-N protocol at sender and receiver site. CO4 (08)
c) Explain the reservation method of controlled access with an example. CO4 (06)

UNIT- V

9. a) With diagrams, differentiate between BSS and ESS. CO5 (07)
b) Give the purpose of BLUETOOTH protocol? Differentiate between Piconets and Scatternet. CO5 (08)
c) What are active and passive hubs? Also draw a diagram to show the hierarchy of hubs. CO5 (05)
10. a) Explain different fields of 802.3 MAC frame. CO5 (06)
b) Mention any four goals of the Gigabit Ethernet design. CO5 (04)
c) With diagrams, differentiate between switched Ethernet and full-duplex Ethernet. CO5 (10)
