Roll No. | | | | | | | | | | |

Paper Code: TCS 505 / TIT-505

(*B.Tech.(CS/IT)*)

Mid Semester Examination 2018

V. *Semester*

Paper Name: - Computer Network II

Time: 1:30 Hours

MM: 50

Note:

(*i*) This question paper contains two sections.

(*ii*) Both sections are compulsory.

Section – A

Q1. Fill in the blanks/True-False (1 X 5 = 5 Marks)

a) The number of intermediate devices will be needed to connect a Source which is 700m away from the Destination using a Category 5 Twisted Pair cable are _____.

b) Ethernet uses _____ encoding.

c) An Ethernet MAC sublayer receives 42 bytes of data from the upper layer. The _____ bytes of padding must be added to the data.

d) The relationship between bit rate and baud rate is _____.

e) The bit rate for the channel having baud rate 1000 bauds and modulation type 8-QAM will be _____ bps.

Q2. Attempt any five parts. (3 X 5 = 15 Marks)

a) Explain why collision is an issue in a random-access protocol but not in controlled access or channelizing protocols.

b) Consider the delay of pure ALOHA versus slotted ALOHA at low load. Which one is less? Explain your answer.

c) What is the polynomial representation of 101110?

d) In CSMA/CD, after the fourth collision, what is the probability that a node chooses $K = 5$?

e) Explain any three techniques of digital-to-digital conversion.

f) Why do you require a limit on the minimum size of Ethernet frame?

Section – B

Each question contains three parts a, b & c. Attempt any two parts of choice from each question.

Q3. (5 X 2 = 10 Marks)

a. A network with one primary and four secondary stations uses polling. The size of a data frame is 1000 bytes. The size of the poll, ACK, and NAK frames are 32 bytes each. Each station has 5 frames to send. How many total bytes are exchanged if there is no limitation on the number of frames a station can send in response to a poll?

b. A group of N stations share a 56kbps pure ALOHA channel. Each station outputs a 1000bit frame on an average of once every 100 sec, even if the previous one has not yet been sent (e.g. the stations are buffered). What is the maximum value of N?

c. An Ethernet MAC sublayer receives 1510 bytes of data from the upper layer. Can the data be encapsulated in one frame? If not, how many frames need to be sent? What is the size of the data in each frame?

Q4. (5 X 2 = 10 Marks)

a. A bit string, 0111101111101111110, needs to be transmitted at the data link layer. What is the string actually transmitted after bit stuffing?

b. Sixteen-bit messages are transmitted using a Hamming code. How many check bits are needed to ensure that the receiver can detect and correct single-bit errors? Show the bit pattern transmitted for the message 1101001100110101. Assume that even parity is used in the Hamming code.

c. Consider the polynomial generator, P (G)=1001, and suppose that D has the value 10101101011. What is the value of CRC?

Q5. (5 X 2 = 10 Marks)

a. Explain the various services provided by Data link layer to Network Layer.

b. Explain the digital to analog conversion techniques ASK, FSK and PSK with an example.

c. What is the result of scrambling the sequence 1011000000000101000010000101 using the following scrambling techniques according to use? Assume that the last non-zero signal level has been positive.

i. B8ZS

ii. HDB3 (The number of nonzero pules is odd after the last substitution).