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***B.Tech. Degree III Semester Supplementary Examination
November 2020 / April 2021***

**CS 15-1306 DATA AND COMPUTER COMMUNICATION
(2015 Scheme)**

Time: 3 Hours

Maximum Marks: 60

PART A
(Answer *ALL* questions)

(10 × 2 = 20)

- I. (a) Suppose a computer sends a frame to another computer on a bus topology LAN. The physical destination address of the frame is corrupted during the transmission. What happens to the frame?
- (b) If a periodic signal is decomposed into five sine waves with frequencies of 100, 300, 500, 700, and 900 Hz, what is its bandwidth?
- (c) Which of the three analog-to-analog conversion techniques (AM, FM, or PM) is the most susceptible to noise? Justify your answer.
- (d) Distinguish between synchronous and statistical TDM.
- (e) What are the three major components of a telephone network?
- (f) What is the definition of a linear block code? What is the definition of a cyclic code?
- (g) Compare and contrast flow control and error control.
- (h) What are the 2 major classes of data compression techniques?
- (i) How is a hub related to a repeater?
- (j) Discuss the three types of mobility in a wireless LAN.



PART B

(4 × 10 = 40)

- II. (a) Differentiate between ISO-OSI model and TCP-IP model.
- (b) Explain the following terms:
 - (i) physical address
 - (ii) logical address
 - (iii) port address
 - (iv) specific address.

OR

- III. Explain the following line coding schemes with an example:
 - (i) NRZ
 - (ii) NRZ-L
 - (iii) NRZ-I
 - (iv) AMI

- IV. Explain spread spectrum technologies.

OR

- V. (a) Explain modulation technique used in ADSL modems.
- (b) What type of topology is used when customers in an area use DSL modems for data transfer purposes? Explain.

(P.T.O.)

- VI. (a) Which of the following CRC generators guarantee the detection of a single bit error? (4)
- (i) x^3+x+1
 - (ii) x^4+x^2
 - (iii) 1
 - (iv) x^2+1
- (b) Find the minimum Hamming distance for the following cases: (6)
- (i) Detection of two errors.
 - (ii) Correction of two errors
 - (iii) Detection of 3 errors or correction of 2 errors
 - (iv) Detection of 6 errors or correction of 2 errors.
- OR**
- VII. (a) Compare and contrast the Go-Back-N ARQ Protocol with Selective Repeat ARQ. (4)
- (b) A 100-character string has the following set of frequencies (6)
- a:5, b:9, c:12, d:13, e:16, f:45
- Create a Huffman tree for the character set and generate code-word for each character.
- VIII. (a) What are the 3 criteria that must be satisfied by a system equipped with transparent bridge? (3)
- (b) Which one has more overhead, a router or a gateway? Explain your answer. (4)
- (c) With the help of a diagram, explain star topology. (3)
- OR**
- IX. (a) Explain Ethernet MAC Frame. (4)
- (b) Explain Bluetooth piconet and scatternet. (6)
