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**Fifth Semester B.E. Degree Examination, July/August 2021**  
**Computer Networks – I**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

- 1
  - a. Define protocol. List and explain key elements of a protocol. (05 Marks)
  - b. With a necessary diagram correlate TCP/IP with layers of OSI model. (10 Marks)
  - c. List and explain different addresses in TCP/IP. (05 Marks)
- 2
  - a. For the given string 11011001 represent the unipolar, polar NRZ, Manchester and differential Manchester encoding techniques. (05 Marks)
  - b. Identify the different transmission impairments observed in data transfer. (05 Marks)
  - c. A telephone line has a bandwidth of 3000 Hz assigned for data communication. The SNR ratio is 3162. Calculate the capacity of the channel. (SNR refers to signal to noise ratio). (05 Marks)
  - d. Explain the concept of shift keying. (05 Marks)
- 3
  - a. Why does multiplexing significant in data transmission? (02 Marks)
  - b. What is synchronous TDM? Explain. (04 Marks)
  - c. What is the main purpose of spread spectrum? Explain FHSS. (08 Marks)
  - d. What do you mean by datagram network? Explain its working principle. (06 Marks)
- 4
  - a. Given dataword "1010" and divisor "1011". Using CRC find the codeword. (06 Marks)
  - b. With a necessary diagram, explain structure of the encoder and decoder for Hamming code with 4 bit dataword. (10 Marks)
  - c. Consider the table shown to represent code.

Dataword	Codeword
0	00000
1	01011
2	10111
3	11111

- Check whether the code is linear code or non-linear code. (04 Marks)
- 5
    - a. Compare and contrast the Go Back N-ARQ protocol with selective repeat ARQ. (10 Marks)
    - b. Define framing and explain its need in data link layer. (05 Marks)
    - c. Assume that, in a stop and wait ARQ system, the bandwidth of the line is 1 Mbps and 1 bit takes 20 ms to make a round trip. What is the bandwidth delay product? (05 Marks)
  - 6
    - a. Explain slotted ALOHA. (08 Marks)
    - b. Write the chip sequence for 2-stations and for 4-stations using Walsh table. (04 Marks)
    - c. What is the role of MAC sublayer? Explain 802.3 MAC-frame. (08 Marks)
  - 7
    - a. Explain different kinds of services defined by IEEE 802.11 architecture. (10 Marks)
    - b. With a neat diagram, explain different categories of connecting devices. (10 Marks)
  - 8
    - a. What is NAT and how can NAT help in address depletion? (05 Marks)
    - b. Compare and contrast the fields in the main headers of IPV4 and IPV6 protocols. (10 Marks)
    - c. Change the following IPV4 addresses from dotted decimal notation to binary notation:
      - i) 111.56.45.78
      - ii) 221.34.7.82
 (05 Marks)

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