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G.R. No.	

U218-143 (ESE)

DECEMBER 2018/ENDSEM

S. Y. B. TECH. (IT) (SEMESTER - I)

COURSE NAME:FUNDAMENTALS OF DATA COMMUNICATION

COURSE CODE: ITUA21173

(PATTERN 2017)

Time: [**2 Hours**] [Max. Marks: **50**]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data whereever required**

Q.1) a) Define the transmission impairments and discuss it with help of signal representation. [6 marks]

OR

b) Describe the terms Time and Frequency and co-relate them, assuming both features are belongs to same signal. Represent two signals in time domain and two signals in frequency domain with distinct features [6 marks]

Q.2) a) Define fallowing terms with example. [6 marks]
i. Band pass signal ii. Guard Band iii. Block coding iv. Parallel transmission

OR

b) Discuss the Functionality of fallowing in brief. [6 marks]
i) Spread spectrum, ii) Multiplexing iii) Modulation

Q.3) a) Explain Infrared transmission in detail. Which devices can communicate using this techniques? Justify infrared is different than Radio transmission? [6 marks]

OR

b) Discuss in detail i) Cable modem ii) Fiber-Optic cable [6 marks]

Q.4) a) Classify Networks depending upon the inter-processor distance. Discuss any two categories. [4 marks]

OR

b) List out the ways in which multiple nodes can be connected within same network. What is the criteria for choosing the best layout for any particular application. Represent any two layouts diagrammatically. [4 marks]

Q.5) a) Discuss how the checksum method works stepwise to send the data 8,1,6,9,11 using 4-bit binary word. Can we use checksum method for error correction? Justify with example. [6 marks]

b) How block coding schema works, explain with example. In the 4B/5B block coding schema, how many codewords are possible and assuming all possible combinations of datawords has been used, how many codewords will be correct and how many of them will be error pruned? [4 marks]

c) Brief about framing techniques. What is the role of Bit stuffing in framing, explain with example. [4 marks]

OR

Q.6) a) List-out four error detection /correction techniques. State the truth of the statement and justify with two different example (different in length of the dataword) "To guarantee correction of up to t errors in all cases, the minimum Hamming distance in a block code must be $d_{min} = 2t + 1$." [6 marks]

b) Explain any one flow control techniques for noiseless channel in brief with help of algorithm/ pseudo code. [4 marks]

c) Draw and explain state Transition phases of node willing to communicate. [4 marks]

Q.7) a) Explain CSMA/CD methods in detail. How it is beneficial for multiple information source generator. Where it stands in state transition diagram of multiple node communication. [6 marks]

b) Differentiate between token passing and reservation method. [4 marks]

c) Which channelization methods are applicable for digital data. Discuss any one method out of it in detail with the help of diagram. [4 marks]

OR

Q.8) a) On what basis multiple access methods has been categorized broadly. Which category is more efficient, justify your answer. [6 marks]

b) What is mean by carrier sense mechanism? How it is beneficial in channel access . [4 marks]

c) Which channelization methods are applicable for analog data. Discuss any one method out of it in detail with the help of diagram. [4 marks]