Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Third Semester B.Tech Degree (S,FE) Examination December 2020 (2015 Scheme)

Course Code: IT203
Course Name: DATA COMMUNICATION

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two full questions, each carries 15 marks.
Marks

1 a) Explain the structure, characteristics and applications of any three guided transmission media.   (10)

   b) How is encoding done in 2B1Q multilevel encoding scheme?   (5)

2 a) With the help of neat sketches, differentiate between simplex, half duplex and full duplex transmission.   (9)

   b) Encode the digital data 01101101101 into digital signal by the two biphase schemes.   (6)

3 a) Explain the distinguishing characteristics of the various techniques for encoding digital data into analog signals. Use neat sketches in all cases.   (10)

   b) Define the terms data rate, signal rate, data element and signal element. Consider a noiseless channel transmitting a signal with 4 signal levels (for each level, two bits are sent). Calculate the maximum bit rate.   (5)

PART B
Answer any two full questions, each carries 15 marks.

4 a) With the help of a neat diagram, explain delta modulation technique for analog to digital conversion.   (10)

   b) What is parity checking? Can this be used to correct errors? Justify your answer with an example.   (5)

5 a) Differentiate between TDM and FDM. Also explain how statistical TDM utilizes channel bandwidth better than synchronous TDM.   (8)

   b) What are the different kinds of errors that may occur in digital data communication? Give examples.   (4)

   c) What are block codes? Give examples.   (3)

6 a) Consider four symbols with probabilities of occurrence $P(x_1) = 0.4$, $P(x_2) = 0.3$, $P(x_3) = 0.2$, $P(x_4) = 0.1$. Determine the arithmetic code for the sequence $x_2x_3x_1x_2$.   (10)

   b) Describe the different techniques for data rate management in time division multiplexing. Give neat figures.   (5)

PART C
Answer any two full questions, each carries 20 marks.

7 a) With the help of an example, explain the Hamming code generation process for a 4-bit data word.   (8)

   b) Discuss the advantages and disadvantages of wireless communication.   (6)

   c) A bit stream 100111001 is transmitted using the standard CRC method. The generator polynomial is x^3+1. Generate the transmitted code word.   (6)

8 a) What is switching? Differentiate between circuit switching, message switching and packet switching.   (10)

   b) Explain the features of BCH codes and RS codes.   (10)

9 a) What are cyclic codes? Give examples. What are the properties of cyclic codes? Also explain the encoding steps of cyclic codes.   (10)

   b) Describe any three GSM services.   (5)

   c) Discuss the significance of a generator matrix and a parity check matrix.   (5)

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