Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

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)	Differentiate between time domain plot and frequency domain plot with examples.	(5)
	b)	If a periodic signal is decomposed into five sine waves with frequencies of 200 Hz, 400Hz, 600Hz, 800Hz and 1000Hz. What is its bandwidth? Draw the spectrum, assuming all components have a maximum amplitude of 15 V.	(4)
	c)	Describe the effects of any three transmission impairments.	(6)
2	a)	Differentiate between Step Index multimode and Graded Index multimode in Optical Fibres.	(4)
	b)	Describe the features and characteristics of Terrestrial microwave.	(5)
	c)	Describe the communication methodology used in Synchronous transmission	(6)
3	a)	Encode the digital data 111010111 using Multilevel binary techniques.	(4)
	b)	Describe the relevance of using Scrambling Techniques with an Example	(7)
	c)	Explain the Differential Phase Shift Keying.	(4)

PART B

Answer any two full questions, each carries 15 marks.

4	a)	Describe in detail about the Delta Modulation Process.	(8)
	b)	Differentiate between Frequency Modulation and Phase Modulation.	(4)
	c)	Differentiate between Uniform and Non-Uniform Quantizations in PCM process.	(3)
5	a)	Encode the string '101011011010101011' using Lempel –Ziv algorithm.	(9)
	b)	A TDM Multiplexer have four sources each creating 150 characters per second. If the interleaved unit is a character and 1 synchronizing bit is added to each frame, find the following. i) data rate of each source. ii) frame rate. iii) frame duration. iv) data rate of the link.	(4)

c) Mention the main concept behind Spread Spectrum techniques. (2)

6 a) Assume an alphabet having four source symbols a_1, a_2, a_3, a_4 with probabilities of occurrences as 0.2, 0.2, 0.4 and 0.2 respectively. Generate Arithmetic code for the input stream $a_1a_2a_3a_3a_4$. (10)

b) Describe the Forward Error Correction Process. Why is it called so? (5)

PART C

Answer any two full questions, each carries 20 marks.

7 a) Describe the Vertical Redundancy Check (VRC) with an example. (5)

b) Describe in detail about the working of CRC Encoder and Decoder with suitable diagrams. (10)

c) Write short note on Parity check matrices and its properties. (5)

8 a) We need a data word of at least 16 bits. Find the values of n and k in hamming code C (n, k) with $d_{min}=3$. (4)

b) A system uses C (7, 4) hamming code with $d_{min}=3$ where the data word 0110 becomes the codeword of 0110100. The receiver got the codeword as 0010100. Find the syndrome for detecting and correcting the error. (6)

c) Write short note on RS codes. (5)

d) Differentiate between Systematic and Unsystematic codes. (5)

9 a) Explain in detail about the basic switching principles. Which switching method is more suitable for data communications? (12)

b) Describe in detail about GSM and GPRS. (8)

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