Reg No.:_____ Name:_____

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S5 (S, FE) / S5 (PT) (S,FE) Examination June 2024 (2015 Scheme)



**Course Code: CS307**

**Course Name: DATA COMMUNICATION**

Max. Marks: 100 Duration: 3 Hours

## PART A

***Answer all questions, each carries 3 marks.*** Marks

1 What are the components of a data communication system? Explain with a diagram. (3)

2 List out the data transmission modes used in data communication and explain each with an example. (3)

3 Why twisting is done in twisted pair cables used as transmission media in computer networks? (3)

4 Name the different types of connectors used in different guided transmission media. (3)

## PART B

***Answer any two full questions, each carries 9 marks.***

5 a) How do you evaluate the effectiveness of a data communication system? Explain. (4)

b) What is the advantage of digital signals over analog signals? Despite its advantage, why digital signals are not used in all data transmissions. (5)

6 a) Describe the construction of a coaxial cable with a neat sketch. (5)

b) What are the different ways in which an unguided signal can travel from source to destination? Explain each with a neat diagram. (4)

7 a) Which are the parameters required for defining a simple sine wave? Define each parameter. Explain it with a proper diagram. (4)

b) Explain the construction of an optical fiber cable with a neat sketch. (5)

## PART C

***Answer all questions, each carries 3 marks.***

8 Which are the three steps involved in digital data to digital signal encoding? Explain the necessity of each step. (3)

9 How many voltage levels are used in a bipolar encoding scheme? Draw the AMI encoding waveform for the digital data stream 10110110. (3)

10 Name the multiplexing technique used for digital transmission. What are the different techniques used for solving data disparity in digital multiplexing? (3)

11 Explain code division multiplexing. (3)

## PART D

***Answer any two full questions, each carries 9 marks.***

12 a) Which are the different sampling techniques used in data communication systems? Explain. (3)

b) How do you convert the analog information to analog signals? What are the techniques used for analog modulation? Explain each one with a neat sketch. (6)

13 a) Explain the digital carrier system used in data communications. (4.5)

b) Explain delta modulation technique used in analog to digital conversion of signals used in data communication. (4.5)

14 a) Explain frequency division multiplexing with a neat diagram. (6)

b) What is the use of guard spaces in Multiplexing? (3)

## PART E

***Answer any four full questions, each carries 10 marks.***

15 a) How do you classify the data transmission modes based on the number of bits transmitted? Explain. (5)

b) Define error control. What are the techniques used for error control? (5)

16 a) What do you mean by block coding? How do you detect errors in block coding? (5)

b) Explain cyclic redundancy check with an example. What are the characteristics of a good polynomial generator? (5)

17 a) Define hamming distance. What is the minimum hamming distance required for guaranteeing error detection and correction upto s errors that can occur in all cases? (3)

b) Find the minimum hamming distance between the following pairs of data. (7)

(1010, 1011), (1001, 1000), (1010, 0101), (0101,1001), (1110,1111), (0111, 1101).

18 a) What is the goal of spread spectrum technique used in wireless communication? (3)

b) With a neat sketch explain frequency hopping spread spectrum technique with an example. (7)

19 a) Differentiate between datagram switching and virtual circuit switching. (5)

b) With a neat sketch, explain circuit switching. (5)

20 a) Describe the structure of a packet switch. (5)

b) Design a three stage switch with N=200, n=20 and k=4. Also find the number of cross points required for single stage, three stage switch. (5)

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