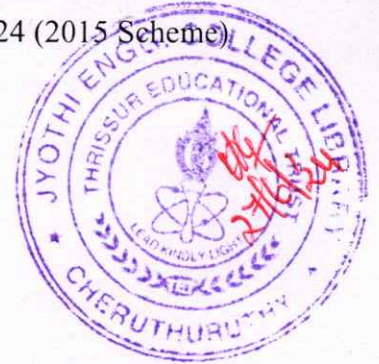


Reg No.: _____

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 (4) parameter. Explain it with a proper diagram.
- 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 (3) the necessity of each step.
- 9 How many voltage levels are used in a bipolar encoding scheme? Draw the AMI (3) encoding waveform for the digital data stream 10110110.
- 10 Name the multiplexing technique used for digital transmission. What are the different (3) techniques used for solving data disparity in digital multiplexing?
- 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? (3) Explain.
- b) How do you convert the analog information to analog signals? What are the (6) techniques used for analog modulation? Explain each one with a neat sketch.
- 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 (4.5) used in data communication.
- 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)
