



PK-003-0496005

Seat No. _____

B. Sc. / M. Sc. (Sem. VI) (CBCS) Examination

August - 2020

Applied Physics : Paper - XXIII
(Digital Communication & Electronics)
(New Course)

Faculty Code : 003

Subject Code : 0496005

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions : (1) All questions are compulsory.
(2) Numbers in the right margin indicate marks.

1 Attempt any seven short questions : (two marks each) **14**

- (1) Explain electromagnetic spectrum for different devices in communication.
- (2) Define Channel Capacity.
- (3) What is the unit of message entropy ?
- (4) What is meant by Coding ? How many types of coding is done ?
- (5) Give two examples of digital communication technology used in today's world.
- (6) Write Bay's Rule.
- (7) Define Conditional Probability.
- (8) Define Joint Probability.
- (9) What is CDF ?
- (10) Why analog communication is better ?

2 (a) Write answers of any two : (five marks each) **10**

- (1) Explain how a signal is converted to digital form.
- (2) Discuss Conditional probability and Joint Probability.
- (3) Explain block diagram of Digital Communication System.
- (4) List advantages of digital communication.

- (b) Write answer of any one : 4
- (1) A bag contains 10 Oranges, 6 Mangoes, 4 Apples. Three fruits are drawn in succession. Find the probability that the fruits will be of different type.
 - (2) A box contains 7 Red, 5 White and 3 Black balls. One ball is drawn at random. Find the probability that it is
 - (A) Not Red
 - (B) White.
- 3** (a) Write answers of any two : (five marks each) **10**
- (1) Compare analog and digital communication.
 - (2) Discuss properties of Probability Distribution Function.
 - (3) What is Probability ? How it is related to communication ?
 - (4) Explain Delta Modulation.
- (b) Write answer of any one : 4
- (1) Explain Binary Symmetric channel.
 - (2) Discuss Properties of Cumulative Distribution Function.
- 4** (a) Write answers of any two : (five marks each) **10**
- (1) Discuss properties of Probability.
 - (2) How probabilities can be shown graphically ? Explain Venn Diagrams.
 - (3) What is Adaptive Delta Modulation ?
 - (4) Define the term Code Efficiency. What is the formula to find the code efficiency ?
- (b) Write answer of any one : 4
- (1) Why Channel Capacity is a prominent parameter in communication ?
 - (2) Discuss properties of information.

5 (a) Write answers of any two : (five marks each) 10

- (1) Explain with example, Equally likely events of an experiment.
- (2) What is Entropy of a message ? How and why it is measured ?
- (3) What is sample and hold ? Explain with neat sketch.
- (4) Why quantization is required in ADC ?

(b) Write answer of any one : 4

- (1) A discrete memoryless source has five message with probability :

$$P(x_1) = 0.3$$

$$P(x_2) = 0.25$$

$$P(x_3) = 0.25$$

$$P(x_4) = 0.2$$

Using Shannon Fano coding technique, find the code for transmission.

- (2) For given data, What will be source code ?

Messages	Probability
M1	0.1
M2	0.2
M3	0.35
M4	0.35
