

UNIT-I**Probability and random variables**

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	Define probability.	Remember	CO1	PO1,PO2,PO4
2	Discuss probability with axioms.	Understand	CO1	PO1,PO2,PO4
3	Write short note on conditional probability.	Remember	CO1	PO1,PO2,PO4
4	Define joint probability.	Remember	CO1	PO1,PO2,PO4
5	Discuss total probability theorem.	Understand	CO1	PO1,PO2,PO4
6	State bayes theorem.	Remember	CO1	PO1,PO2,PO4
7	Discuss how probability can be considered as relative frequency	Understand	CO1	PO1,PO2,PO4
8	Describe random variable concept.	Understand	CO1	PO1,PO2,PO4
9	Identify a sample space for an event A.	Understand	CO1	PO1,PO2,PO4
10	State multiplication theorem .	Understand	CO1	PO1,PO2,PO4
Part – B (Long Answer Questions)				
11	a) Define probability .State and prove total probability theorem and Bayes' theorem.	Remember	CO1	PO1,PO2,PO4
	b) A computer manufacturer uses chips from three sources. Chips from sources A, B, and C are defective with probabilities 0.001, 0.005 and 0.01 respectively. If a randomly selected chip is found to be defective, find the probability that the manufacturer was A; that manufacturer was C.	Remember	CO1	PO1,PO2,PO4
12	a) A man wins in a gambling game if he gets two heads in five flips of a biased coin. The probability of getting a head with the coin is 0.7. i) Find the probability the man will win. Should he play this game. ii) What is the probability of winning if he wins by getting at least four heads in five flips. Should he play this new game.	Understand	CO1	PO1,PO2,PO4
	b) Define the following with example (i) Relative frequency definition of probability (ii) Conditional probability and (iii) Total probability.	Understand	CO1	PO1,PO2,PO4
13	a) A certain large city averages three murders per week and their occurrences follow a Poisson distribution 1. What is the probability that there will be five or more murders in a given week. 2. On the average, how many weeks a year can this city expect to have no murders. 3. How many weeks per year (average) can the city expect the number of murders per week to equal or exceed the average number per week.	Remember	CO1	PO1,PO2,PO4
	b) Mention different types of defining conditional events	Understand	CO1	PO1,PO2,PO4
14	a) Define following types of events. 1) Simple events 2) Compound events 3) Independent events 4) Joint events 5) Conditional events with examples	Remember	CO1	PO1,PO2,PO4
	b) In a box there are 500 color red balls 75 black 150 green 175 red 70 white and 30 blue what are the probabilities of selecting a ball of each color.	Understand	CO1	PO1,PO2,PO4
15	a) Two cards are drawn from a 52 Cards i. Given the first card is a queen, what is the probability that the second is also a queen. ii. Repeat part a) for the first card a queen and the second card a 7 iii. What is the probability that both cards will be a queen.	Understand	CO1	PO1,PO2,PO4

PROBABILITY THEORY AND STOCHASTIC PROCESS

	b)	Explain all properties of distribution and density functions		CO1	PO1,PO2,PO4
16	a)	In a bolt factory there are four machines A, B, C, D manufacturing 20%, 15%, 25%, 40% of the total production of these 5%, 4%, 3%, 2% are found to be defective. If a bolt is drawn at random and was found to be defective what is the probability that it was manufactured by A or D.	Remember	CO1	PO1,PO2,PO4
	b)	Describe and draw different types of distribution and density functions.		CO1	PO1,PO2,PO4

