Sardar Vallabhbhai Patel Institute of Technology, Vasad

Subject: Probability and Statistics Subject Code: 310006

Tutorial 5: Probability

Q.1	A card is drawn at random from a pack of 52 cards. What is the probability that the card is a spade or a king?
Q.2	State Baye's theorem. There are three bags; first containing 1 white, 2 red and 3green balls; second 2 white, 3 red and 1green balls and third 3 white, 1 red and 2 green balls. Two balls are drawn from a beg chosen at random. These are found to be 1 white and 1 red. Find the probability that the balls so drawn came from the second bag.
Q.3	An MBA applies for a job in two firms X and Y. The probability of his being selected in firm X is 0.7 and being rejected in Y is 0.5. The probability of at least one of his applications being rejected is 0.6. What is the probability that he will selected in one the firms?
Q.4	A study showed that 65% of managers had some business education and 50% had some engineering education. Furthermore 20% the managers had some business education but no engineering education. What is the probability that a manager had some business education, given that he has some engineering education?
Q.5	A manufacturing firm produces steel pipes in three plants with daily production volume of 500, 1000, 2000 units respectively. According to experience it is know that the fractions of defective output produced the three plants are respectively 0.05, 0.08, and 0.10. If a pipe is selected from a day's total production and found to be defective. What is the probability that it came from the first plant? Also find out from which plant the defective pipe comes.
Q.6	Seventy percent of the light aircraft that disappear while in flight in a certain country are subsequently discovered. Of the aircraft that are discovered, 60% have an emergency locator, whereas 90% of the aircraft not discovered do not have such a locator. Suppose a light aircraft has disappeared. (i) If it has an emergency locator, what is the probability that it will not be discovered? (ii) If it does not have an emergency locator, what is the probability that it will be discovered?
Q.7	An insurance company insured 2000 bike drivers, 4000 car drivers and 6000 truck drivers. The probability of an accident involving a bike driver, a car driver and a truck driver is 0.10, 0.03 and 0.15 respectively. One of the insured persons meets with an accident. What is the probability that he is a bike driver?
Q.8	If A and B are independent events with $P(A)$ = 0.26, and $P(B)$ = 0.45, find (a) $P(A \cap B)$; (b) $P(A \cap \bar{B})$; (c) $P(\bar{A} \cap \bar{B})$.
Q.9	A market survey was conducted in four cities to find out the preference for brand A soap. The responses are shown below: Delhi Kolkata Chennai Mumbai Yes 45 55 60 50 No 35 45 35 45 No opinion 5 5 5 5 (a) What is the probability that a consumer preferred brand A, given that he was from Chennai? (b) Given that a consumer preferred brand A, what is the probability that he was from Mumbai?

Q.10	A microchip company has two machines that produce the chips. Machine I produce 65% of the chips, but 5% of its chips are defective. Machine II produce 35% of the chips and 15% of its chips are defective. A chip is selected at random and found to be defective. What is the probability that it came from Machine I?
Q.11	If 3 balls are “randomly drawn” from a bowl containing 6 white and 5 black balls. What is the probability that one of the balls is white and the other two black?
Q.12	In how many ways can 4 of 15 laboratory assistants be chosen to assist with an experiment?
Q.13	A single card is drawn from a well shuffled deck of 52 cards. Find the odds that the card is a red eight.