

CLASS XII – MATHEMATICS – CHAPTER 13

PROBABILITY

Name:

Date:

- Q01.** In a school there are 1000 students, out of which 430 are girls. It is known that out of 430, 10% of the girls study in class XII. What is the probability that a student chosen randomly studies in class XII given that the chosen student is a girl?
- Q02.** A die thrown three times. Events A and B are defined as below.
A : 4 on the third throw
B : 6 on the first and 5 on the second throw.
Find the probability of A given that B has already occurred.
- Q03.** Mother, father and son line up at random for a family picture
E : Son on one end
F : Father in middle
Find $(E|F)$.
- Q04.** An instructor has a question bank consisting of 300 easy True / False questions, 200 difficult True / False questions, 500 easy multiple choice questions and 400 difficult multiple choice questions. If a question is selected at random from the question bank, what is the probability that it will be an easy question given that it is a multiple choice question?
- Q05.** If A and B are two independent events, then the probability of occurrence of at least one of A and B is given by $1 - P(A')P(B')$.
- Q06.** A – Box of oranges is inspected by examining three randomly selected oranges drawn without replacement. If all the three oranges are good, the box is approved for sale, otherwise, it is rejected. Find the probability that a box containing 15 oranges out of which 12 are good and 3 are bad ones will be approved for sale.
- Q07.** A fair coin and an unbiased die are tossed. Let A be the event head appear on the coin and B be the event 3 on the die. Check whether A and B are independent events or not.
- Q08.** Probability of solving specific problem independently by A and B are $\frac{1}{2}$ and $\frac{1}{3}$ respectively. If both try to solve the problem independently, find the probability that
(i) the problem is solved (ii) Exactly one of them solves the problem.

DCA CLASSES

- Q09.** In a hostel 60% of the students read Hindi news paper, 40% read English newspaper and 20% read both Hindi and English news papers. A student is selected at random.
- (a) Find the probability that she read neither Hindi nor English news papers.
- (b) If she reads Hindi news paper, find the probability that she reads English news paper.
- (c) If she reads English news papers, find the probability that she reads Hindi news paper.
- Q10.** Three cards are drawn successively, without replacement from a pack of 52 well shuffled cards. What is the probability that first two cards are kings and the third card drawn is ace.
- Q11.** Given three identical boxes I, II and III each containing two coins. In box-I both coins are gold coins, in box-II, both are silver coins and in the box-III, there is one gold and one silver coin. A person chooses a box at random and takes out a coin. If the coin is of gold, what is the probability that the other coin in the box is also of gold.
- Q12.** Suppose that the reliability of a HIV test is specified as follows of people having HIV, 90% of the test detect the disease but 10% go undetected of people free of HIV, 99% of the test are judged HIV – ive but 1% are diagnosed as showing HIV +ive. From a large population of which only 0.1% have HIV, one person is selected at random, given the HIV test, and the pathologist reports him/her is HIV +tive what is the probability that the person actually has HIV.
- Q13.** In a factory which manufactures bolts, machines. A, B and C manufacture respectively 25%, 35% and 40% of the bolts. Of their output 5, 4 and 2 percent are respectively defective bolts. A bolt is drawn at random from the product and is found to be defective. What is the probability that it is manufactured by the machine B.
- Q14.** A doctor is to visit a patient. From the past experience, it is known that the probabilities that he will come by train, bus, scooter or by other mean of transport are respectively $\frac{3}{10}$, $\frac{1}{5}$, $\frac{1}{10}$ and $\frac{2}{5}$. The probabilities that he will be late if he comes by train, bus and scooter respectively, but he comes by other means of transport, that he will not be late. When he arrives he is late. What is the probability that he comes by train.
- Q15.** In answering a question on a multiple choice test a student either knows the answer or guesses. Let $\frac{3}{4}$ be the probability that he knows the answer and $\frac{1}{4}$ be the probability he guesses. Assuming that a student who guesses at the answer will be correct with probability $\frac{1}{4}$. What is the probability that the student knows the answer given that he answered it correctly.

DCA CLASSES

- Q16.** A man is known to speak truth 3 out of 4 times. He throws a die and reports that it is a six. Find the probability that it is actually a six.
- Q17.** A laboratory blood test is 99% effective in detecting a certain disease when it is in fact, present. However, the test also yields a false positive result for 0.5% of the healthy person tested (i. e if a healthy person is test then with probability 0.005 the test will imply he has the disease) If 0.1 percent of the population actually has the disease, what is the probability that a person has the disease given that his test result is positive.
- Q18.** An insurance company insured 2000 scooter drivers, 4000, car drivers and 6000 truck drivers. The probability of accidents is 0.01, 0.03 and 0.15 respectively. One of the insured persons meet with an accident what is the probability that he is scooter driver.
- Q19.** A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn and are found to be both diamonds. Find the probability of the lost card being a diamond.
- Q20.** Suppose a girl throws a die. If she gets a 5 or 6, she tosses a coin three times and notes the number of heads. If she gets 1, 2, 3, 4, she tosses a coin once and notes whether a head or tail is obtained. If she obtained exactly one had, what is the probability that she threw 1, 2, 3 or 4 with the die?
- Q21.** Find the probability distribution of number of doublets in three throws of a pair of dice.
- Q22.** Find the variance of the number obtained on a throw of an unbiased die.
- Q23.** Two cards are drawn simultaneously (or successively without replacement) for a well shuffled of 52 cards. Find the mean, variance and standard deviation of the number of kings.
- Q24.** From a lot of 30 bulbs which include 6 defectives, a sample of 4 bulbs is drawn at random with replacement. Find the probability distribution of the number of defective bulbs.
- Q25.** A and B throw a die alternatively till one of them gets a '6' and win the game. Find their respective probabilities of winning if A starts first.
- Q26.** Bag I contain 3 red and 4 black balls and bag II contain 4 red and 5 black balls. One ball is transferred from Bag I to Bag II and then a ball is drawn from Bag II. The ball so drawn is found to be red in colour. Find the probability that the transferee ball is black.