PROBABILITY ASSIGNMENT CLASS-XII

1. An unbiased coin is tossed 6 times. Find using binomial distribution, the probability of getting at least 5 heads.
2. There are 2000 scooter drivers, 4000 car drivers and 6000 truck drivers all insured. The probabilities of an accident involving a scooter, a car, a truck are 0.01,0.03,0.15 respectively. One of the insured drivers meets with an accident. What is the probability that he is a scooter driver?
3. A die is thrown twice and the sum of the numbers appearing is 6. What is the conditional probability that number 4 has appeared at least once?
4. An unbiased coin is tossed 10times. Find, by using binomial distribution, the probability of getting at least 3 heads.
5. If $P(E)$ =0.45, $P(F)$ = 0.55, $P(E \cup F)$ = 0.75, find *(i)* $P(E \cap F)$ *(ii)* $P(E/F)$.
6. Three bags *A, B,* C contain 6 red 4 black; 4 red, 6 black and 5 black, 5 red balls respectively. One of the bags is selected at random and a ball is drawn from it. If the ball drawn is red, find the probability that it is drawn from the first bag.
7. A student is given a test with 8 items of true-false type. If he gets 6 or more items correct, he is declared pass. Given that he guesses the answer to each item, compute the probability that he will pass in the test.
8. 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.
9. An unbiased die is thrown three times. Getting 3 or 5 is considered a success. Find the probability of at least two successes.
10. *A,* speaks truth in 60% of the cases and *B* in 90% of the cases. In what percentage of cases they are likely to contradict each other in stating the same fact.
11. Ganesh appears for an interview for two posts *A* and *B,* selection for which is independent. the probability of selection for post *A* is 1/5 and for post *B* is 1/8 .What is the probability that Ganesh is selected for at least one of the posts?
12. One bag contains 6 white and 5 black balls and another bag contains 5 white and 4 black balls. One ball at random is transferred from the first bag to the second bag and then a ball is drawn from the second bag. Find the probability that the ball drawn is white.
13. For two independent events *A* and *B,* $P(A)$ = 0.38, $P(A \cup B)$ = 0.69, find $P(B)$.
14. A bag contains 5 blue, 4 white and 7 green balls. 2 balls are drawn at random. Find the probability that the balls drawn are green.
15. A problem in Mathematics is given to three students, whose chances of solving it are 1/3 , ¼ , 1/5 What is the probability that the problem is solved ?
16. *A* and *B* take turns in throwing two dice. The first to throw a sum 10,being awarded. Show that if *A* has the first throw, their chances of winning are in the ratio 12 : 11.
17. Using Binomial probability distribution, find the probability of obtaining 'less than 3 heads' when an unbiased coin is tossed 6 times.
18. Find the probability of drawing a 'diamond' card in each of the two consecutive draws from a well shuffled pack of cards, if the card is replaced after the first draw.
19. The probabilities of *A, B,* C solving a problem are 1/3 , 2/7 and 3/8 respectively. If all the three try to solve the problem simultaneously ,find the probability that exactly one of them can solve it.
20. A class consists of 10 boys and 8 girls. Three students are selected at random. What is the probability that the selected group has (i) all boys *(ii)* all girls *(iii)* I boy and 2 girls *(iv)* at least one girl *(v)* at most one girl?
21. A bag contains 5 red, 6 blue and 4 black balls. Three balls are drawn. Find the probability that none of them is red.
22. Three light bulbs are selected at random from 20 bulbs of which 5 are defective. What is the probability that exactly one is defective?
23. State multiplicative law of probability. *A* speaks truth in 70% cases and *B* in 80% cases. In what per cent of cases are they likely to contradict each other in stating the same fact?
24. An urn contains 2 white and 4 black balls and another urn contains 5 white and 7 black balls. A ball is drawn from the first urn and without nothing its colour, is put in the second urn. A ball is then drawn from the second urn. Find the probability that the ball drawn is white.

25. A factory has three machines X, Y and Z producing 1000,2000 and 3000 bolts per day respectively. The machine produces 1% defective bolts, *Y* produces 1.5% and Z produces 2% defective bolts. At the end of a day, a bolt is drawn at random and is found defective. What is the probability that this defective bolt has been produced by the machine X ?
26. A bag contains 5 red, 6 white and 7 black balls. Two balls are drawn at random. What is the probability that both balls are red or both are black?
27. A bag contains 8 red, 3 white and 9 blue balls. If three balls are drawn at random, determine the probability that (i) all the three balls are blue balls *(ii)* all the balls are of different colours.
28. Bag *A* contains 6 red and 5 blue balls and another bag *B* contains 5 red and 8 blue balls. A ball is drawn from bag *A* without seeing its colour and it is put into the bag *B.* Then a ball is drawn from bag *B* at random. Find the probability that the ball drawn is blue in colour.
29. In bag *A* there are 5 white and 8 red balls, in bag *B,* 7 white and 6 red balls and in bag C, 6 white and 5 red balls. One ball is taken out at random from each bag. Find the probability that all the three balls are of the same colour.
30. Twodice are tossed together. Find the probability that the sum of the numbers is neither a multiple of 3 nor a multiple of 4.
31. A problem in Mathematics is given to three students whose chances of solving it are 1/3 , 1/5 and 1/6 respectively. Find the probability that one of them is able to solve the problem correctly.
32. Events *A* and *B* are given to be independent. Find *P(B),* if it is given that *P(A)* = 0.35, *P(A* ∪ *B)* = 0.60.
33. *A* and *B* throw a die alternately till one of them gets a "6" and wins the game. Find their respective probability of winning; if *A* starts the game.
34. The probability of *A* solving a problem is 3/7 and that of *B* solving it is 1/3 . What is the probability that *(i)* at least one of them will solve the problem? *(ii)* only one of them will solve the problem?
35. From a well shuffled pack of 52 cards, 3 cards are drawn one by one with replacement. Find the probability distribution of number of queens.
36. The probability of *A* hitting a target is 4/5 and that of *B* hitting it is 2/3 They both fire at the target. Find the probability that (i) at least one of them will hit the target *(ii)* only one of them will hit the target.
37. If *P(A)* =0.3, *P(B)* =0.7 and *P(B/A)* = 0.5, find *P(A/B)* and *P(A* ∪ *B).*
38. A company has two plants to manufacture bicycles. The first plant manufactures 60% of the bicycles and the second plant 40%. 80% of the bicycles are rated of standard quality at the first plant and 90% of standard quality at the second plant. A bicycle is picked up at random and found to be of standard quality. Find the probability that it comes from the second plant.

ANSWERS

1.. 7/64 **2.** 1/52 **3.** 2/5 **4.** 121/ 128 **5.** (i) 0.25 (ii) 5/11 **6.** 2/5 **7.** 37/256 **8.** 3/8 **9.** 7/27 **10.** 42% **11.** 3/10 **12.** 61/110 **13.** ½ **14.** 7/40 **15.** 3/5 **16.** 11/32 **17.** 11/32 **18.** 1/16 **19.** 25/56 **20.** (i) 5/34 (ii) 7/102 (iii) 35/612 (iv) 29/34 (v) 15/68 **21.** 24/91 **22.** 35/76 **23.** 38% **24.** 16/39 **25.** 1/10 **26.** 31/153 **27.**(i) 7/95 (ii) 18/95 **28.** 93/154 **29.** 450/ 1859 **30.** 4/9 **31.** 19/45 **32.** 0.38 **33.** 6/11 , 5/11 **34.** (i) 13/21 (ii) 10/21 **35.**

X	0	1	2	3
P(X)	$(12/13)^3$	$3/13(12/13)^2$	$36/13(1/13)^2$	$(1/13)^3$

36. (i) 14/15 (ii) 2/5 **37.** (i) 3/14 (ii) 0.85 **38.** 3/7

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