1. 6 coins are tossed simultaneously . The propability of getting atleast 6 heads is :

(A) $\frac{57}{64}$ (B) $\frac{229}{256}$

(C) $\frac{7}{64}$ (D) $\frac{37}{256}$

2. The probabilities of three mutually exclusive events are $\frac{2}{3}$, $\frac{1}{4}$ & $\frac{1}{6}$.

The statement is :

(A) True (B) Wrong

(C) Could be either

(D) Do not know

3. A & B toss a coin alternatively, the first to show a head being the winner. If A starts the game, the chance of his winning is :

(A) $\frac{5}{8}$ (B) $\frac{1}{2}$

(C) $\frac{1}{3}$ (D) $\frac{2}{3}$

4. A & B are two events such that and P (A) = 0.4, P (A + B) = 0.7 and P (AB) = 0.2, then P (B) =

(A) 0.1 (B) 0.3

(C) 0.5 (D) None of these

5. Suppose that A, B, C are events such that P (A) = P (B) = P (C) = $\frac{1}{4}$,

P (AB) = P (CB) = 0, P (AC) = $\frac{1}{8}$,

then P (A + B) =

(A) 0.125 (B) 0.25

(C) 0.375 (D) 0.5

6. A single letter is selected at random from the word "PROBABILITY" . The probability that the selected letter is a vowel is :

(A) $\frac{2}{11}$ (B) $\frac{3}{11}$

(C) $\frac{4}{11}$ (D) 0

7. If A & B are two events such that, P (A $\cup$ B) = P (A $\cap$ B), then the true relation is :

(A) P (A) = P (B) = 0

(B) P (A) + P (B) = P (A) P $\left(\frac{B}{A}\right)$

(C) P (A) + P (B) = 2 P (A) P $\left(\frac{B}{A}\right)$

(D) None of these

8. A coin is tossed and a dice is rolled . The probability that the coin shows the head and the dice shows 6 is :

(A) $\frac{1}{8}$ (B) $\frac{1}{12}$

(C) $\frac{1}{2}$ (D) 1

9. A card is drawn at random from a pack of cards . The probability of this card being a red or a queen is :

(A) $\frac{1}{13}$ (B) $\frac{1}{26}$

(C) $\frac{1}{2}$ (D) $\frac{7}{13}$

10. The probability of happening an even A is 0.5 and that of B is 0.3 . If A & B are mutually exclusive events, then

the probability of happening neither A nor B is :

(A) 0.6 (B) 0.2

(C) 0.21 (D) None of these

11. If $P(A) = 0.4$, $P(B) = x$, $P(A \cup B) = 0.7$ and the events A & B are independent, then x =

(A) $\frac{1}{3}$ (B) $\frac{1}{2}$

(C) $\frac{2}{3}$ (D) None of these

12. A box contains 6 nails and 10 nuts . Half of the nails and half of the nuts are rusted . If one item is chosen at random, what is the probability that it is rusted or is a nail .

(A) $\frac{3}{16}$ (B) $\frac{5}{16}$

(C) $\frac{11}{16}$ (D) $\frac{14}{16}$

13. A man draws a card from a pack of 52 playing cards, replaces it and shuffles the pack . He continues this process until he gets a card of spade . The probability that he will fail the first two times is :

(A) $\frac{9}{16}$ (B) $\frac{1}{16}$

(C) $\frac{9}{64}$ (D) None of these

14. In a box of 10 electric bulbs, two are defective . Two bulbs are selected at random one after the other from the box . The first bulb after selection being put back in the box before making the second selection . The probability that both the bulbs are without defect is :

(A) $\frac{9}{25}$ (B) $\frac{16}{25}$

(C) $\frac{4}{5}$ (D) $\frac{8}{25}$

15. If A & B are any two events, then the true relation is :

(A) $P(A \cap B) > P(A) + P(B) - 1$

(B) $P(A \cap B) < P(A) + P(B)$

(C) $P(A \cap B) = P(A) + P(B) - P(A \cup B)$

(D) None of these

16. A box contains 15 tickets numbered 1, 2, ... , 15 . Seven tickets are drawn at random one after the other with replacement . The probability that the greatest number on a drawn ticket is 9, is :

(A) $\left(\frac{9}{10}\right)^6$ (B) $\left(\frac{8}{15}\right)^7$

(C) $\left(\frac{3}{5}\right)^7$ (D) None of these

17. A purse contains 4 copper coins & 3 silver coins, the second purse contains 6 copper coins & 2 silver coins . If a coin is drawn out of any purse, then the probability that it is a copper coin, is :

(A) $\frac{4}{7}$ (B) $\frac{3}{4}$

(C) $\frac{37}{56}$ (D) None of these

18. If A & B are any two events, then the probability that exactly one of them occur is :
(A) $P(A) + P(B) - P(A \cap B)$
(B) $P(A) + P(B) - 2P(A \cap B)$
(C) $P(A) + P(B) - P(A \cup B)$
(D) $P(A) + P(B) - 2P(A \cup B)$

19. If A & B are two mutually exclusive events, then P (A + B) =
(A) P (A) + P (B) - P (AB)
(B) P (A) - P (B)
(C) P (A) + P (B)
(D) P (A) + P (B) + P (AB)

20. The probability of happening atleast one of the events A & B is 0.6 . If the events A & B hapens simultaneously with the probability 0.2, then

$P(\overline{A}) + P(\overline{B}) =$

(A) 0.4 (B) 0.8
(C) 1.2 (D) None of these

21. A problem of mathematics is given to three students whose chances of solving the problem are $\frac{1}{3}$, $\frac{1}{4}$ & $\frac{1}{5}$ respectively . The probability that the question will be solved is :

(A) $\frac{2}{3}$ (B) $\frac{3}{4}$

(C) $\frac{4}{5}$ (D) $\frac{3}{5}$

22. If $P(A_1 \cup A_2) = 1 - P(A_1^c)\, P(A_2^c)$, where c stands for complement, then the events A_1 & A_2 are :
(A) Mutually exclusive
(B) Independent
(C) Equally likely
(D) None of these

23. A speaks truth in 75% cases and B in 80% cases . In what % of cases are they likely to contradict each other in stating the same fact .
(A) 5 % (B) 55 %
(C) 35 % (D) 45 %

24. Six boys and six girls sit in a row . What is the probability that the boys and girls sit alternatively .

(A) $\frac{1}{462}$ (B) $\frac{1}{924}$

(C) $\frac{1}{2}$ (D) None of these

25. A man and a woman appear in an interview for 2 vacancies in the same post . The prob. of man's selction is 1/4 and that of woman's selection is 1/3 . What is the probability that none of them will be selected ?

(A) $\frac{1}{2}$ (B) $\frac{1}{12}$

(C) $\frac{1}{4}$ (D) None of these

26. 3 dice are thrown simultaneously. What is the probability of obtaining a total of 17 or 18 ?

(A) $\frac{1}{9}$ (B) $\frac{1}{72}$

(C) $\frac{1}{54}$ (D) None of these

27. An unbiased die with faces marked 1, 2, 3, 4, 5 & 6 is rolled four times . Out of four face values obtained the

probability that the minimum face value is not less that 2 and the maximum face value is not greater than 5, is :

(A) $\frac{16}{81}$ (B) $\frac{1}{81}$

(C) $\frac{80}{81}$ (D) $\frac{65}{81}$

28. A coin is tossed until a head appears or until the coin has been tossed five times . If a head does not occur on the first two tosses, then the probability that the coin will be tossed 5 times is :

(A) $\frac{1}{2}$ (B) $\frac{3}{5}$

(C) $\frac{1}{4}$ (D) $\frac{1}{3}$

29. Cards are drawn one by one at random from a well shuffled full pack of 52 cards until two aces are obtained for the first time . If N is the number of cards required to be drawn then $P_r(N = n)$, where $2 \le n \le 50$, is :

(A) $\frac{(n-1)(52-n)(51-n)}{50 \times 49 \times 17 \times 13}$

(B) $\frac{2(n-1)(52-n)(51-n)}{50 \times 49 \times 17 \times 13}$

(C) $\frac{3(n-1)(52-n)(51-n)}{50 \times 49 \times 17 \times 13}$

(D) $\frac{4(n-1)(52-n)(51-n)}{50 \times 49 \times 17 \times 13}$

30. The probabilities that A & B will die within a year are p & q respectively, then the probability that only one of them will be alive at the end of the year is :

(A) p + q (B) P + q - 2 qp

(C) p + q - pq (D) p + p + pq

31. One hundred identical coins each with probability p of showing up heads are tossed once . If $0 < p < 1$ and the probability of heads showing on 50 coins is equal to that of heads showing on 51 coins, then the value of p is :

(A) $\frac{1}{2}$ (B) $\frac{49}{101}$

(C) $\frac{50}{101}$ (D) $\frac{51}{101}$

32. The letter of the word "ASSASSIN" are written down at random in a row. The probability that no two S occur together is :

(A) $\frac{1}{35}$ (B) $\frac{1}{14}$

(C) $\frac{1}{15}$ (D) None of these

33. A bag A contains 2 white & 3 red balls & bag B contains 4 white & 5 red balls . One ball is drawn at random from a randomly chosen bag and is found to be red . The probability that it was drawn from bag B was :

(A) $\frac{5}{14}$ (B) $\frac{5}{16}$

(C) $\frac{5}{18}$ (D) $\frac{25}{52}$

34. India plays two matches each with West Indies & Australia . In any match

the probabilities of India getting point 0, 1 & 2 are 0.45, 0.05 & 0.50 respectively . Assuming that the outcomes are independents, the probability of India getting atleast 7 points is :

(A) 0.8750 (B) 0.0875
(C) 0.0625 (D) 0.0250

35. From the word "POSSESSIVE", a letter is chosen at random . The probability of it to be S is :

(A) $\frac{3}{10}$ (B) $\frac{4}{10}$

(C) $\frac{3}{6}$ (D) $\frac{4}{6}$

36. If A & B are two independent events such that $P(A \cap B') = 3/25$ and $P(A' \cap B) = 8/25$, then $P(A) =$

(A) $\frac{1}{5}$ (B) $\frac{3}{8}$

(C) $\frac{2}{5}$ (D) $\frac{4}{5}$

37. A fair coin is tossed n times . Let X be the number of times head is observed . If P (X = 4), P (X = 5) and P (X = 6) are in H.P., then it is equal to

(A) 7 (B) 10
(C) 14 (D) None of these

38. A pair of fair dice is rolled together till a sum of either 5 or 7 is obtained. Then the probability that 5 comes before 7 is :

(A) $\frac{1}{5}$ (B) $\frac{2}{5}$

(C) $\frac{4}{5}$ (D) None of these

39. Urn A contains 6 red & 4 black balls and urn B contains 4 red & 6 black balls . One ball is drawn at random from urn A & placed in urn B . Then one ball is drawn at random from urn B & placed in urn A . If one ball is now drawn at random from urn A, the prob. that it is found to be red is :

(A) $\frac{32}{55}$ (B) $\frac{21}{55}$

(C) $\frac{19}{55}$ (D) None of these

40. A box contains 100 tickets numbered 1, 2, ... , 100 . Two tickets are chosen at random . It is given that the maximum number on the two chosen tickets is not more than 10 . The minimum number on them is 5 with probability :

(A) $\frac{1}{8}$ (B) $\frac{13}{15}$

(C) $\frac{1}{7}$ (D) None of these

41. If $\frac{1+3p}{3}$, $\frac{1-p}{4}$ and $\frac{1-2p}{2}$ are the probabilities of 3 mutually exclusive events, then the set of all values of p is :

(A) $\frac{1}{3} \le p \le \frac{1}{2}$ (B) $\frac{1}{3} < p < \frac{1}{2}$

(C) $\frac{1}{3} \le p \le \frac{2}{3}$ (D) $\frac{1}{3} < p < \frac{2}{3}$

42. Let p denotes the probability that a man aged x years will die in a year . The probability that out of n men A_1, A_2, A_3, ... , A_n each aged x, A_1 will die in a year and will be the first to die, is :

(A) $\frac{1}{n}[1-(1-p)^n]$ (B) $[1-(1-p)^n]$

(C) $\frac{1}{n-1}[1-(1-p)^n]$

(D) None of these

43. For a biased die the probabilities for different faces to turn up are given below,

Face :	1	2	3	4	5	6
Probability :	.1	.32	.21	.15	.05	.17

The die is tossed and you are told that either face 1 or 2 has turned up . Then the probability that it is face 1, is :

(A) $\frac{5}{21}$ (B) $\frac{5}{22}$

(C) $\frac{4}{21}$ (D) None of these

44. One bag contains 5 white & 4 black balls . Another bag contains 7 white and 9 black balls . A ball is transferred from the first bag to the second and then a ball is drawn from second . The probability that the ball is white is :

(A) $\frac{8}{17}$ (B) $\frac{40}{153}$

(C) $\frac{5}{9}$ (D) $\frac{4}{9}$

45. A die is tossed twice . Getting a number greater than 4 is considered a success . Then the variance of the probability distribution of the number of successes is :

(A) $\frac{2}{9}$ (B) $\frac{4}{9}$

(C) $\frac{1}{27}$ (D) None of these

46. Three groups of children contain respectively 3 girls & 1 boy, 2 girls & 2 boys, 1 girl & 3 boys . One child is selected at random from each group . The chance that three selected consisting of 1 girl & 2 boys, is :

(A) $\frac{9}{32}$ (B) $\frac{3}{32}$

(C) $\frac{13}{32}$ (D) None of these

47. Out of 21 tickets marked with numbers from 1 to 21, three are drawn at random . The chance that the numbers on them are in A.P., is

(A) $\frac{10}{133}$ (B) $\frac{9}{133}$

(C) $\frac{9}{1330}$ (D) None of these

48. A determinant is chosen at random . The set of all determinants of order 2 with elements 1 or 1 only . The probability that the value of the determinant chosen is positive, is :

(A) $\frac{3}{16}$ (B) $\frac{3}{8}$

(C) $\frac{1}{4}$ (D) None of these

49. An unbiased coin is tossed . If the result is a head, a pair of unbiased dice is rolled and the number obtained by adding the numbers on the two faces is noted . If the result is a tail, a card from a well shuffled pack of eleven cards numbered 2, 3, 4, ... , 12 is picked and the number on the card is noted . The probability that the noted number is either 7 or 8, is :

(A) 0.24 (B) 0.244
(C) 0.024 (D) None of these

50. A bag contains 3 white, 3 black and 2 red balls . One by one three balls are drawn without replacing them . The probability that the third ball is red, is :

(A) $\frac{1}{2}$ (B) $\frac{1}{3}$

(C) $\frac{2}{3}$ (D) $\frac{1}{4}$

51. Three groups A, B, C are competing for positions on the Board fo Directors of a company . The probabilities of their winning are 0.5, 0.3, 0.2 respectively . If the group A wins, the probability of introducing a new product is 0.7 and the corresponding probabilities for the group B & C are 0.6 & 0.5 respectively . The prob. that the new product will be introduced, is :

(A) 0.18 (B) 0.35
(C) 0.10 (D) 0.63

52. The probability that a man can hit a target is 3/4 . He tries 5 times . The probability that he will hit the target atleast three times, is :

(A) $\frac{291}{364}$ (B) $\frac{371}{464}$

(C) $\frac{471}{502}$ (D) $\frac{459}{512}$

53. Three of the six vertices of a regular hexagon are chosen at random . The probability that the triangle with these 3 vertices is equilateral, is equal to :

(A) $\frac{1}{2}$ (B) $\frac{1}{5}$

(C) $\frac{1}{10}$ (D) $\frac{1}{20}$

54. A bag contains 3 red, 4 white and 5 blue balls . All balls are different . Two balls are drawn at random . The probability that they are of different colour, is :

(A) $\frac{47}{66}$ (B) $\frac{10}{33}$

(C) $\frac{5}{22}$ (D) None of these

55. In order to get atleast once a head with probability ≥ 0.9, the number of times a coin needs to be tossed, is :

(A) 3 (B) 4
(C) 5 (D) None of these

56. Let $0 < P(A) < 1$, $0 < P(B) < 1$ and $P(A \cup B) = P(A) + P(B) - P(A)\ P(B)$. Then :

(A) $P\left(\frac{B}{A}\right) = P(B) - P(A)$

(B) $P(A^c \cup B^c) = P(A^c) + P(B^c)$

(C) $P(A \cup B)^c = P(A^c)\ P(B^c)$

(D) $P\left(\frac{A}{B}\right) = P(A)$

57. Odds 8 to 5 against a person who is 40 years old living till he is 70 and 4 to 3 against another person now 50 till he will be living 80 . Probability that one of them will be alive next 30 years, is :

(A) $\frac{59}{91}$ (B) $\frac{44}{91}$

(C) $\frac{51}{91}$ (D) $\frac{32}{91}$

58. A die is tossed thrice . A success is getting a or 6 on a toss . The mean & the variance of number of successes

(A) $\mu = 1, \sigma^2 = \frac{2}{3}$ (B) $\mu = \frac{2}{3}, \sigma^2 = 1$

(C) $\mu = 2, \sigma^2 = \frac{2}{3}$ (D) None of these

59. In a certain town, 40% of the people have brown hair, 25% have brown eyes and 15% have both brown hair and brown eyes . If a person selected at random from the town, has brown hair, the probability that he also has brown eyes, is :

(A) $\frac{1}{5}$ (B) $\frac{3}{8}$

(C) $\frac{1}{3}$ (D) $\frac{2}{3}$

60. If X follows a binomial distribution with parameters n = 6 & p and $4(P(X = 4)) = P(X = 2)$, then p =

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$

(C) $\frac{1}{6}$ (D) $\frac{1}{3}$

61. The value of C for which, $P(X = k) = Ck^2$ can serve as the prob. function of a random variable X, that takes 0, 1, 2, 3, 4 is :

(A) $\frac{1}{30}$ (B) $\frac{1}{10}$

(C) $\frac{1}{3}$ (D) $\frac{1}{15}$

62. For the three events A, B & C, P (exactly one of the events A or B occurs = P (exactly one of the events B or C occurs) = P (exactly one of the events C or A occurs) = p & P (all the three events occur simultaneously) = p^2, where $0 < p < \frac{1}{2}$. Then the prob. of atleast one of the three events A, B and C occuring, is :

(A) $\frac{3p + 2p^2}{2}$ (B) $\frac{p + 3p^2}{4}$

(C) $\frac{p + 3p^2}{2}$ (D) $\frac{3p + 2p^2}{4}$

63. A six faced dice is biased that it is twice as likely to show an even number as an odd number when thrown . It is thrown twice . The probability that the sum of two numbers thrown is even, is :

(A) $\frac{1}{12}$ (B) $\frac{1}{6}$

(C) $\frac{1}{3}$ (D) $\frac{2}{3}$

ANSWERS

1. D 2. B 3. D 4. C 5. D 6. D
7. C 8. B 9. D 10. B 11. B 12.C
13. C 14. B 15. ABC 16. C 17.C
18. B 19. ACD 20. C 21. D 22.B
23. C 24. A 25. A 26. C 27. A 28.C
29. A 30. B 31. D 32. B 33. D 34.B
35. B 36. A 37. D 38. B 39. A 40.B
41. A 42. A 43. A 44. D 45. B 46.C
47. A 48. A 49. B 50. D 51. D 52.D
53.C 54. A 55. B 56. AD 57. B 58.A
59.B 60. D 61. A 62. A 63. D