Ordinary Thinking

Objective Questions

Definition of various terms

1. Two coins are tossed. Let A be the event that the first coin shows head and B be the event that the second coin shows a tail. Two events A and B are
(a) Mutually exclusive
(b) Dependent
(c) Independent and mutually exclusive
(d) None of these

2. 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 and A_2 are **[MP PET 1989]**
(a) Mutually exclusive (b) Independent
(c) Equally likely (d) None of these

3. Two fair dice are tossed. Let A be the event that the first die shows an even number and B be the event that the second die shows an odd number. The two event A and B are **[IIT 1979]**
(a) Mutually exclusive
(b) Independent and mutually exclusive
(c) Dependent
(d) None of these

4. A card is drawn from a pack of 52 cards. If A = card is of diamond, B = card is an ace and $A \cap B$ = card is ace of diamond, then events A and B are
(a) Independent (b) Mutually exclusive
(c) Dependent (d) Equally likely

5. If A and B are two independent events, then A and $\overline{B}$ are
(a) Not independent (b) Also independent
(c) Mutually exclusive (d) None of these

6. Let A, B, C be three mutually independent events. Consider the two statements S_1 and S_2

S_1 : A and $B \cup C$ are independent

S_2 : A and $B \cap C$ are independent

Then **[IIT 1994]**
(a) Both S_1 and S_2 are true
(b) Only S_1 is true
(c) Only S_2 is true
(d) Neither S_1 nor S_2 is true

7. If $P(A) = 2/3$, $P(B) = 1/2$ and $P(A \cup B) = 5/6$ then events A and B are **[Kerala (Engg.) 2002]**
(a) Mutually exclusive
(b) Independent as well as mutually exhaustive
(c) Independent
(d) Dependent only on A

Definition of probability

1. Two card are drawn successively with replacement from a pack of 52 cards. The probability of drawing two aces is **[MNR 1988; UPSEAT 2000]**
(a) $\frac{1}{169}$ (b) $\frac{1}{221}$
(c) $\frac{1}{2652}$ (d) $\frac{4}{663}$

2. In a single throw of two dice, the probability of getting more than 7 is **[MP PET 1991]**
(a) $\frac{7}{36}$ (b) $\frac{7}{12}$
(c) $\frac{5}{12}$ (d) $\frac{5}{36}$

3. The probability of drawing a white ball from a bag containing 3 black balls and 4 white balls, is
(a) $\frac{4}{7}$ (b) $\frac{3}{7}$
(c) $\frac{1}{7}$ (d) None of these

4. A and 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 **[MP PET 1987]**
(a) 5/8 (b) 1/2
(c) 1/3 (d) 2/3

5. If two balanced dice are tossed once, the probability of the event, that the sum of the integers coming on the upper sides of the two dice is 9, is **[MP PET 1987]**
(a) $\frac{7}{18}$ (b) $\frac{5}{36}$
(c) $\frac{1}{9}$ (d) $\frac{1}{6}$

6. From a well shuffled pack of cards one card is drawn at random. The probability that the card drawn is an ace is
(a) $\frac{1}{13}$ (b) $\frac{4}{13}$
(c) $\frac{3}{52}$ (d) None of these

7. A single letter is selected at random from the word "PROBABILITY". The probability that the selected letter is a vowel is **[MNR 1986; UPSEAT 2000]**
(a) $\frac{2}{11}$ (b) $\frac{3}{11}$
(c) $\frac{4}{11}$ (d) 0

8. There are n letters and n addressed envelopes. The probability that all the letters are not kept in the right envelope, is

(a) $\frac{1}{n!}$ (b) $1-\frac{1}{n!}$

(c) $1-\frac{1}{n}$ (d) None of these

9. From a book containing 100 pages, one page is selected randomly. The probability that the sum of the digits of the page number of the selected page is 11, is

(a) $\frac{2}{25}$ (b) $\frac{9}{100}$

(c) $\frac{11}{100}$ (d) None of these

10. There are two childrens in a family. The probability that both of them are boys is

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) $\frac{1}{4}$ (d) None of these

11. If a dice is thrown twice, then the probability of getting 1 in the first throw only is

(a) $\frac{1}{36}$ (b) $\frac{3}{36}$

(c) $\frac{5}{36}$ (d) $\frac{1}{6}$

12. Two cards are drawn one by one at random from a pack of 52 cards. The probability that both of them are king, is **[MP PET 1994]**

(a) $\frac{2}{13}$ (b) $\frac{1}{169}$

(c) $\frac{1}{221}$ (d) $\frac{30}{221}$

13. A coin is tossed and a dice is rolled. The probability that the coin shows the head and the dice shows 6 is **[MP PET 1994; Pb. CET 2001]**

(a) $\frac{1}{8}$ (b) $\frac{1}{12}$

(c) $\frac{1}{2}$ (d) 1

14. A coin is tossed twice. The probability of getting head both the times is **[MNR**

(a) $\frac{1}{2}$ (b) $\frac{1}{4}$

(c) $\frac{3}{4}$ (d) 1

15. From a pack of 52 cards two are drawn with replacement. The probability, that the first is a diamond and the second is a king, is

(a) $\frac{1}{26}$ (b) $\frac{17}{2704}$

(c) $\frac{1}{52}$ (d) None of these

16. Two dice are thrown simultaneously. The probability of getting the sum 2 or 8 or 12 is

(a) $\frac{5}{18}$ (b) $\frac{7}{36}$

(c) $\frac{7}{18}$ (d) $\frac{5}{36}$

17. A dice is thrown twice. The probability of getting 4, 5 or 6 in the first throw and 1, 2, 3 or 4 in the second throw is

(a) 1 (b) $\frac{1}{3}$

(c) $\frac{7}{36}$ (d) None of these

18. Two cards are drawn from a pack of 52 cards. What is the probability that at least one of the cards drawn is an ace

(a) $\frac{33}{221}$ (b) $\frac{188}{221}$

(c) $\frac{1}{26}$ (d) $\frac{21}{221}$

19. One card is drawn from each of two ordinary packs of 52 cards. The probability that at least one of them is an ace of heart, is

(a) $\frac{103}{2704}$ (b) $\frac{1}{2704}$

(c) $\frac{2}{52}$ (d) $\frac{2601}{2704}$

20. 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 **[MP PET 1992, 2000]**

(a) $\frac{3}{16}$ (b) $\frac{5}{16}$

(c) $\frac{11}{16}$ (d) $\frac{14}{16}$

21. The probability of getting at least one tail in 4 throws of a coin is **[MNR 1983; Kurukshetra CEE 1998]**

(a) $\frac{15}{16}$ (b) $\frac{1}{16}$

(c) $\frac{1}{4}$ (d) None of these

22. Three letters are to be sent to different persons and addresses on the three envelopes are also written. Without looking at the addresses, the probability that the letters go into the right envelope is equal to **[MNR 1982; MP PET 1990; Orissa JEE 2004]**

(a) $\frac{1}{27}$ (b) $\frac{1}{9}$

(c) $\frac{4}{27}$ (d) $\frac{1}{6}$

23. Two dice are thrown. The probability that the sum of numbers appearing is more than 10, is

(a) $\frac{1}{18}$ (b) $\frac{1}{12}$

(c) $\frac{1}{6}$ (d) None of these

24. The probability of getting a total of 5 or 6 in a single throw of 2 dice is **[MP PET 1988]**

(a) $\frac{1}{2}$ (b) $\frac{1}{4}$

(c) $\frac{1}{3}$ (d) $\frac{1}{6}$

25. The probability of a sure event is

(a) 0 (b) 1

(c) 2 (d) $\frac{1}{2}$

26. The probability of happening an event A in one trial is 0.4. The probability that the event A happens at least once in three independent trials is **[IIT 1980; Kurukshetra CEE 1998; DCE 2001]**

(a) 0.936 (b) 0.784

(c) 0.904 (d) 0.216

27. In a single throw of two dice the probability of obtaining an odd number is

(a) $\frac{1}{6}$ (b) $\frac{1}{2}$

(c) $\frac{1}{3}$ (d) None of these

28. From 10,000 lottery tickets numbered from 1 to 10,000, one ticket is drawn at random. What is the probability that the number marked on the drawn ticket is divisible by 20

(a) $\frac{1}{100}$ (b) $\frac{1}{50}$

(c) $\frac{1}{20}$ (d) $\frac{1}{10}$

29. Two dice are thrown simultaneously. What is the probability of obtaining a multiple of 2 on one of them and a multiple of 3 on the other

(a) $\frac{5}{36}$ (b) $\frac{11}{36}$

(c) $\frac{1}{6}$ (d) $\frac{1}{3}$

30. A problem of mathematics is given to three students whose chances of solving the problem are 1/3, 1/4 and 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) $\frac{3}{5}$

31. The probability of getting number 5 in throwing a dice is **[MP PET 1988]**

(a) 1 (b) $\frac{1}{3}$

(c) $\frac{1}{6}$ (d) $\frac{5}{6}$

32. A card is drawn from a well shuffled pack of cards. The probability of getting a queen of club or king of heart is **[MP PET 1988]**

(a) $\frac{1}{52}$ (b) $\frac{1}{26}$

(c) $\frac{1}{18}$ (d) None of these

33. In a simultaneous throw of three coins, what is the probability of getting at least 2 tails

(a) $\frac{1}{8}$ (b) $\frac{1}{4}$

(c) $\frac{1}{2}$ (d) None of these

34. In a throw of a die, what is the probability of getting a number less than 7

(a) 0 (b) 1

(c) $\frac{1}{2}$ (d) None of these

35. Two dice are thrown simultaneously. What is the probability of obtaining sum of the numbers less than 11

(a) $\frac{17}{18}$ (b) $\frac{1}{12}$

(c) $\frac{11}{12}$ (d) None of these

36. The probability that an ordinary or a non-leap year has 53 sunday, is **[MP PET 1996]**

(a) $\frac{2}{7}$ (b) $\frac{1}{7}$

(c) $\frac{3}{7}$ (d) None of these

37. A card is drawn at random from a pack of 52 cards. The probability that the drawn card is a court card *i.e.* a jack, a queen or a king, is

(a) $\frac{3}{52}$ (b) $\frac{3}{13}$

(c) $\frac{4}{13}$ (d) None of these

38. Two dice are thrown together. The probability that sum of the two numbers will be a multiple of 4 is **[MP PET 1990]**

(a) $\frac{1}{9}$ (b) $\frac{1}{3}$

(c) $\frac{1}{4}$ (d) $\frac{5}{9}$

39. If in a lottary there are 5 prizes and 20 blanks, then the probability of getting a prize is

(a) $\frac{1}{5}$ (b) $\frac{2}{5}$

(c) $\frac{4}{5}$ (d) None of these

40. The probability of getting a number greater than 2 in throwing a die is **[MP PET 1988]**

(a) $\frac{1}{3}$ (b) $\frac{2}{3}$

(c) $\frac{1}{2}$ (d) $\frac{1}{6}$

41. Two cards are drawn from a pack of 52 cards. What is the probability that one of them is a queen and the other is an ace

(a) $\frac{2}{663}$ (b) $\frac{2}{13}$

(c) $\frac{4}{663}$ (d) None of these

42. Two dice are thrown together. If the numbers appearing on the two dice are different, then what is the probability that the sum is 6

(a) $\frac{5}{36}$ (b) $\frac{1}{6}$

(c) $\frac{2}{15}$ (d) None of these

43. A man and a woman appear in an interview for two vacancies in the same post. The probability of man's selection is 1/4 and that of the woman's selection is 1/3. What is the probability that none of them will be selected **[MNR 1988]**

(a) $\frac{1}{2}$ (b) $\frac{1}{12}$

(c) $\frac{1}{4}$ (d) None of these

44. Three fair coins are tossed. If both heads and tails appears, then the probability that exactly one head appears, is

(a) $\frac{3}{8}$ (b) $\frac{1}{6}$

(c) $\frac{1}{2}$ (d) $\frac{1}{3}$

45. A bag contains 4 white, 5 black and 6 red balls. If a ball is drawn at random, then what is the probability that the drawn ball is either white or red

(a) $\frac{4}{15}$ (b) $\frac{1}{2}$

(c) $\frac{2}{5}$ (d) $\frac{2}{3}$

46. A card is drawn at random from a pack of cards. What is the probability that the drawn card is neither a heart nor a king

(a) $\frac{4}{13}$ (b) $\frac{9}{13}$

(c) $\frac{1}{4}$ (d) $\frac{13}{26}$

47. In a single throw of two dice what is the probability of getting a total 13

(a) 0 (b) 1

(c) $\frac{13}{36}$ (d) $\frac{25}{36}$

48. Three dice are thrown simultaneously. What is the probability of obtaining a total of 17 or 18**[AI CBSE 19**

(a) $\frac{1}{9}$ (b) $\frac{1}{72}$

(c) $\frac{1}{54}$ (d) None of these

49. A box contains 10 good articles and 6 with defects. One article is chosen at random. What is the probability that it is either good or has a defect

(a) $\frac{24}{64}$ (b) $\frac{40}{64}$

(c) $\frac{49}{64}$ (d) $\frac{64}{64}$

50. The probability of happening of an impossible event *i.e.* $P(\phi)$ is **[MP PET 1993]**

(a) 1 (b) 0

(c) 2 (d) –1

51. 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) $\frac{1}{3}$

52. Two dice are tossed. The probability that the total score is a prime number is

(a) $\frac{1}{6}$ (b) $\frac{5}{12}$

(c) $\frac{1}{2}$ (d) None of these

53. Three persons work independently on a problem. If the respective probabilities that they will solve it are 1/3, 1/4 and 1/5, then the probability that none can solve it **[MNR 1990; UPSEAT 2000]**

(a) $\frac{2}{5}$ (b) $\frac{3}{5}$

(c) $\frac{1}{3}$ (d) None of these

54. Two dice are thrown. The probability that the sum of the points on two dice will be 7, is **[IIT 1974; MNR 1981 RPET 1995, 97, 2002; UPSEAT 2000]**

(a) $\frac{5}{36}$ (b) $\frac{6}{36}$

(c) $\frac{7}{36}$ (d) $\frac{8}{36}$

55. The probability that an event will fail to happen is 0.05. The probability that the event will take place on 4 consecutive occasions is

(a) 0.00000625 (b) 0.18543125
(c) 0.00001875 (d) 0.81450625

56. The chance of throwing at least 9 in a single throw with two dice, is **[SCRA 1980]**

(a) $\frac{1}{18}$ (b) $\frac{5}{18}$
(c) $\frac{7}{18}$ (d) $\frac{11}{18}$

57. 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) $\frac{4}{6}$

58. Three identical dice are rolled. The probability that same number will appear on each of them will be **[SCRA 1991; MP PET 1989; IIT 1984; RPET 2000, 02; DCE 2001]**

(a) $\frac{1}{6}$ (b) $\frac{1}{36}$
(c) $\frac{1}{18}$ (d) $\frac{3}{28}$

59. For the two events A and B, $P(A) = 0.38$, $P(B) = 0.41$, then the value of $P(A \text{ not})$ is

(a) 0.41 (b) 0.62
(c) 0.59 (d) 0.21

60. The probabilities of winning the race by two athletes A and B are $\frac{1}{5}$ and $\frac{1}{4}$. The probability of winning by neither of them, is

(a) $\frac{3}{5}$ (b) $\frac{3}{4}$
(c) $\frac{2}{5}$ (d) $\frac{4}{5}$

61. The probability of getting head and tail alternately in three throws of a coin (or a throw of three coins), is **[RPET 1997]**

(a) $\frac{1}{8}$ (b) $\frac{1}{4}$
(c) $\frac{1}{3}$ (d) $\frac{3}{8}$

62. If A and B are mutually exclusive events, then the value of $P(A \text{ or } B)$ is

(a) 0 (b) –1
(c) 1 (d) None of these

63. If A is a sure event, then the value of $P(A \text{ not })$ is

(a) 0 (b) –1
(c) 1 (d) None of these

64. A number is chosen at random from first ten natural numbers. The probability that number is odd and perfect square is

(a) $\frac{2}{9}$ (b) $\frac{2}{5}$
(c) $\frac{3}{7}$ (d) $\frac{1}{5}$

65. A number is chosen from first 100 natural numbers. The probability that the number is even or divisible by 5, is

(a) $\frac{3}{4}$ (b) $\frac{2}{3}$
(c) $\frac{4}{5}$ (d) $\frac{3}{5}$

66. Two dice are thrown. If first shows 5, then the probability that the sum of the numbers appears on both is 8 or more than 8, is

(a) $\frac{1}{12}$ (b) $\frac{11}{12}$
(c) $\frac{1}{3}$ (d) $\frac{2}{3}$

67. A card is drawn randomly from a pack of playing cards. Then the probability that it is neither ace nor king, is

(a) $\frac{11}{13}$ (b) $\frac{8}{13}$
(c) $\frac{10}{13}$ (d) $\frac{12}{13}$

68. There are 4 envelopes with addresses and 4 concerning letters. The probability that letter does not go into concerning proper envelope, is

or

There are four letters and four addressed envelopes. The chance that all letters are not despatched in the right envelope is **[RPET 1997; MP PET 1999; DCE 1999]**

(a) $\frac{19}{24}$ (b) $\frac{21}{23}$
(c) $\frac{23}{24}$ (d) $\frac{1}{24}$

69. There are n letters and n addressed envelops. The probability that each letter takes place in right envelop is

(a) $\frac{1}{n!}$ (b) $\frac{1}{(n-1)!}$
(c) $1-\frac{1}{n!}$ (d) None of these

70. If the probabilities of boy and girl to be born are same, then in a 4 children family the probability of being at least one girl, is

(a) $\frac{14}{16}$ (b) $\frac{15}{16}$
(c) $\frac{1}{8}$ (d) $\frac{3}{8}$

71. A determinant is chosen at random from the set of all determinants of order 2 with elements 0 or 1 only. The probability that the determinant chosen is non-zero is

(a) $\frac{3}{16}$ (b) $\frac{3}{8}$

(c) $\frac{1}{4}$ (d) None of these

72. The event A is independent of itself if and only if $P(A) =$

(a) 0 (b) 1

(c) 0, 1 (d) None of these

73. A locker can be opened by dialing a fixed three digit code (between 000 and 999). A stranger who does not know the code tries to open the locker by dialing three digits at random. The probability that the stranger succeeds at the k^{th} trial is

(a) $\frac{k}{999}$ (b) $\frac{k}{1000}$

(c) $\frac{k-1}{1000}$ (d) None of these

74. In a throw of three dice, the probability that at least one die shows up 1, is

(a) $\frac{5}{6}$ (b) $\frac{91}{216}$

(c) $\frac{1}{36}$ (d) $\frac{125}{216}$

75. A card is drawn at random from a well shuffled pack of 52 cards. The probability of getting a two of heart or diamond is

(a) $\frac{1}{26}$ (b) $\frac{1}{52}$

(c) $\frac{1}{13}$ (d) None of these

76. A man and his wife appear for an interview for two posts. The probability of the husband's selection is $\frac{1}{7}$ and that of the wife's selection is $\frac{1}{5}$. What is the probability that only one of them will be selected **[AISSE 1987; DSSE 1979, 81, 84]**

(a) $\frac{1}{7}$ (b) $\frac{2}{7}$

(c) $\frac{3}{7}$ (d) None of these

77. A bag contains 5 white, 7 red and 8 black balls. If four balls are drawn one by one without replacement, what is the probability that all are white **[AISSE 1987]**

(a) $\frac{1}{969}$ (b) $\frac{1}{380}$

(c) $\frac{5}{20}$ (d) None of these

78. The probability of A, B, C solving a problem are $\frac{1}{3}, \frac{2}{7}, \frac{3}{8}$ respectively. If all the three try to solve the problem simultaneously, the probability that exactly one of them will solve it, is

(a) $\frac{25}{168}$ (b) $\frac{25}{56}$

(c) $\frac{20}{168}$ (d) $\frac{30}{168}$

79. In a single throw of two dice, the probability of obtaining a total of 7 or 9, is

(a) $\frac{5}{18}$ (b) $\frac{1}{6}$

(c) $\frac{1}{9}$ (d) None of these

80. A bag contains 19 tickets numbered from 1 to 19. A ticket is drawn and then another ticket is drawn without replacement. The probability that both the tickets will show even number, is

(a) $\frac{9}{19}$ (b) $\frac{8}{18}$

(c) $\frac{9}{18}$ (d) $\frac{4}{19}$

81. The probability of hitting a target by three marksmen are $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$ respectively. The probability that one and only one of them will hit the target when they fire simultaneously, is

(a) $\frac{11}{24}$ (b) $\frac{1}{12}$

(c) $\frac{1}{8}$ (d) None of these

82. A determinant is chosen at random. The set of all determinants of order 2 with elements 0 or 1 only. The probability that value of the determinant chosen is positive, is

(a) 3/16 (b) 3/8

(c) 1/4 (d) None of these

83. One card is drawn from a pack of 52 cards. The probability that it is a king or diamond is **[MP PET 1990, 1994; RPET 1996]**

(a) $\frac{1}{26}$ (b) $\frac{3}{26}$

(c) $\frac{4}{13}$ (d) $\frac{3}{13}$

84. 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 **[MNR 1994]**

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) $\frac{2}{3}$ (d) $\frac{1}{4}$

85. The probability of obtaining sum '8' in a single throw of two dice

(a) $\frac{1}{36}$ (b) $\frac{5}{36}$

(c) $\frac{4}{36}$ (d) $\frac{6}{36}$

86. For any event A **[RPET 1995]**

(a) $P(A)+P(\overline{A})=0$ (b) $P(A)+P(\overline{A})=1$

(c) $P(A)>1$ (d) $P(\overline{A})<1$

87. A box contains 3 white and 2 red balls. A ball is drawn and another ball is drawn without replacing first ball, then the probability of second ball to be red is **[Roorkee 1995]**

(a) $\frac{8}{25}$ (b) $\frac{2}{5}$

(c) $\frac{3}{5}$ (d) $\frac{21}{25}$

88. The probability of India winning a test match against West Indies is $\frac{1}{2}$. Assuming independence from match to match, the probability that in a 5 match series India's second win occurs at the third test, is **[IIT 1995; Pb. CET 200**

(a) $\frac{2}{3}$ (b) $\frac{1}{2}$

(c) $\frac{1}{4}$ (d) $\frac{1}{8}$

89. A card is drawn at random from a pack of 100 cards numbered 1 to 100. The probability of drawing a number which is a square is

(a) $\frac{1}{5}$ (b) $\frac{2}{5}$

(c) $\frac{1}{10}$ (d) None of these

90. Seven chits are numbered 1 to 7. Three are drawn one by one with replacement. The probability that the least number on any selected chit is 5, is **[EAMCE**

(a) $1-\left(\frac{2}{7}\right)^4$ (b) $4\left(\frac{2}{7}\right)^4$

(c) $\left(\frac{3}{7}\right)^3$ (d) None of these

91. If $P(A)=0.65,\ P(B)=0.15$, then $P(\overline{A})+P(\overline{B})=$ **[Pb. CET 1989; EAMCET 1988]**

(a) 1.5 (b) 1.2

(c) 0.8 (d) None of these

92. For any two independent events E_1 and E_2, $P\{(E_1\cup E_2)\cap(\overline{E}_1\cap\overline{E}_2)\}$ is **[IIT 1991; Pb. CET 2003**

(a) $<\frac{1}{4}$ (b) $>\frac{1}{4}$

(c) $\geq\frac{1}{2}$ (d) None of these

93. For independent events $A_1, A_2, \ldots\ldots, A_n$, $P(A_i)=\frac{1}{i+1},\ i=1, 2, \ldots\ldots, n$. Then the probability that none of the event will occur, is

(a) $\frac{n}{n+1}$ (b) $\frac{n-1}{n+1}$

(c) $\frac{1}{n+1}$ (d) None of these

94. In order to get at least once a head with probability ≥ 0.9, the number of times a coin needs to be tossed is **[Roorkee 1989]**

(a) 3 (b) 4

(c) 5 (d) None of these

95. A bag contains 3 black and 4 white balls. Two balls are drawn one by one at random without replacement. The probability that the second drawn ball is white, is **[MP PET 1995]**

(a) $\frac{4}{49}$ (b) $\frac{1}{7}$

(c) $\frac{4}{7}$ (d) $\frac{12}{49}$

96. 'A' draws two cards with replacement from a pack of 52 cards and 'B' throws a pair of dice what is the chance that 'A' gets both cards of same suit and 'B' gets total of 6 **[MNR 1989]**

(a) $\frac{1}{144}$ (b) $\frac{1}{4}$

(c) $\frac{5}{144}$ (d) $\frac{7}{144}$

97. A box contains 2 black, 4 white and 3 red balls. One ball is drawn at random from the box and kept aside. From the remaining balls in the box, another ball is drawn at random and kept aside the first. This process is repeated till all the balls are drawn from the box. The probability that the balls drawn are in the sequence of 2 black, 4 white and 3 red is

(a) $\frac{1}{1260}$ (b) $\frac{1}{7560}$

(c) $\frac{1}{126}$ (d) None of these

98. A dice is rolled three times, the probability of getting a larger number than the previous number each time is

(a) $\frac{15}{216}$ (b) $\frac{5}{54}$

(c) $\frac{13}{216}$ (d) $\frac{1}{18}$

99. Cards are drawn one by one without replacement from a pack of 52 cards. The probability that 10 cards will precede the first ace is

(a) $\frac{241}{1456}$ (b) $\frac{164}{4165}$

(c) $\frac{451}{884}$ (d) None of these

100. The probability that a teacher will give an unannounced test during any class meeting is 1/5. If a student is absent twice, then the probability that the student will miss at least one test is

(a) $\frac{4}{5}$ (b) $\frac{2}{5}$

(c) $\frac{7}{5}$ (d) $\frac{9}{25}$

101. The chances of throwing a total of 3 or 5 or 11 with two dice is

(a) $\frac{5}{36}$ (b) $\frac{1}{9}$

(c) $\frac{2}{9}$ (d) $\frac{19}{36}$

102. A six faced dice is so 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 **[Kur**

(a) $\frac{1}{12}$ (b) $\frac{1}{6}$

(c) $\frac{1}{3}$ (d) $\frac{2}{3}$

103. The chance of India winning toss is 3/4. If it wins the toss, then its chance of victory is 4/5 otherwise it is only 1/2. Then chance of India's victory is **[Kurukshetra CEE 1998]**

(a) $\frac{1}{5}$ (b) $\frac{3}{5}$

(c) $\frac{3}{40}$ (d) $\frac{29}{40}$

104. From a pack of 52 cards one card is drawn at random, the probability that it is either a king or a queen is

(a) $\frac{1}{13}$ (b) $\frac{2}{13}$

(c) $\frac{3}{13}$ (d) $\frac{4}{13}$

105. From a pack of 52 cards, two cards are drawn one by one without replacement. The probability that first drawn card is a king and second is a queen, is **[MP PET 1997]**

(a) $\frac{2}{13}$ (b) $\frac{8}{663}$

(c) $\frac{4}{663}$ (d) $\frac{103}{663}$

106. The probabilities of a student getting I, II and III division in an examination are respectively $\frac{1}{10}, \frac{3}{5}$ and $\frac{1}{4}$. The probability that the student fails in the examination is **[MP PET 1997]**

(a) $\frac{197}{200}$ (b) $\frac{27}{100}$

(c) $\frac{83}{100}$ (d) None of these

107. An unbiased die is tossed until a number greater than 4 appears. The probability that an even number of tosses is needed is

(a) $\frac{1}{2}$ (b) $\frac{2}{5}$

(c) $\frac{1}{5}$ (d) $\frac{2}{3}$

108. Two dice are thrown together. The probability that at least one will show its digit 6 is

(a) $\frac{11}{36}$ (b) $\frac{36}{11}$

(c) $\frac{5}{11}$ (d) $\frac{1}{6}$

109. A bag contains 30 balls numbered from 1 to 30, one ball is drawn randomly. The probability that number on the ball is multiple of 5 or 7 is

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) $\frac{2}{3}$ (d) $\frac{1}{4}$

110. A person can kill a bird with probability 3/4. He tries 5 times. What is the probability that he may not kill the bird **[RPET 1997]**

(a) $\frac{243}{1024}$ (b) $\frac{781}{1024}$

(c) $\frac{1}{1024}$ (d) $\frac{1023}{1024}$

111. A fair coin is tossed repeatedly. If tail appears on first four tosses then the probability of head appearing on fifth toss equals

(a) $\frac{1}{2}$ (b) $\frac{1}{32}$

(c) $\frac{31}{32}$ (d) $\frac{1}{5}$

112. A coin is tossed 3 times by 2 persons. What is the probability that both get equal number of heads **[DCE 199**

(a) $\frac{3}{8}$ (b) $\frac{1}{9}$

(c) $\frac{5}{16}$ (d) None of these

113. The sum of two positive numbers is 100. The probability that their product is greater than 1000 is **[RPET 1999]**

(a) $\frac{7}{9}$ (b) $\frac{7}{10}$

(c) $\frac{2}{5}$ (d) None of these

114. The corners of regular tetrahedrons are numbered 1, 2, 3, 4. Three tetrahedrons are tossed. The probability that the sum of upward corners will be 5 is **[AMU 1999]**

(a) $\frac{5}{24}$ (b) $\frac{5}{64}$

(c) $\frac{3}{32}$ (d) $\frac{3}{16}$

115. An integer is chosen at random and squared. The probability that the last digit of the square is 1 or 5 is **[AMU 1999]**

(a) $\frac{2}{10}$ (b) $\frac{3}{10}$

(c) $\frac{4}{10}$ (d) $\frac{9}{25}$

116. Two integers are chosen at random and multiplied. The probability that the product is an even integer is **[AMU 1999]**

(a) $\frac{1}{2}$ (b) $\frac{2}{3}$

(c) $\frac{3}{4}$ (d) $\frac{4}{5}$

117. A binary number is made up of 16 bits. The probability of an incorrect bit appearing is p and the errors in different bits are independent of one another. The probability of forming an incorrect number is **[AMU 1999]**

(a) $\frac{p}{16}$ (b) p^{16}

(c) ${}^{16}C_1 p^{16}$ (d) $1-(1-p)^{16}$

118. A coin is tossed 4 times. The probability that at least one head turns up is

(a) $\frac{1}{16}$ (b) $\frac{2}{16}$

(c) $\frac{14}{16}$ (d) $\frac{15}{16}$

119. The probability that in a year of the 22^{nd} century chosen at random there will be 53 Sundays is **[Orissa**

(a) $\frac{3}{28}$ (b) $\frac{2}{28}$

(c) $\frac{7}{28}$ (d) $\frac{5}{28}$

120. Suppose that a die (with faces marked 1 to 6) is loaded in such a manner that for $K = 1, 2, 3...., 6$, the probability of the face marked K turning up when die is tossed is proportional to K. The probability of the event that the outcome of a toss of the die will be an even number is equal to

(a) $\frac{1}{2}$ (b) $\frac{4}{7}$

(c) $\frac{2}{5}$ (d) $\frac{1}{21}$

121. What is the probability that when one die is thrown, the number appearing on top is even

(a) $\frac{1}{6}$ (b) $\frac{1}{3}$

(c) $\frac{1}{2}$ (d) None of these

122. From a pack of 52 cards two cards are drawn in succession one by one without replacement. The probability that both are aces is

(a) $\frac{2}{13}$ (b) $\frac{1}{51}$

(c) $\frac{1}{221}$ (d) $\frac{2}{21}$

123. Three coins are tossed together, then the probability of getting at least one head is **[RPET 2001**

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$

(c) $\frac{1}{8}$ (d) $\frac{7}{8}$

124. A pair of a dice thrown, if 5 appears on at least one of the dice, then the probability that the sum is 10 or greater is **[MP PET 2001]**

(a) $\frac{11}{36}$ (b) $\frac{2}{9}$

(c) $\frac{3}{11}$ (d) $\frac{1}{12}$

125. In a college, 25% of the boys and 10% of the girls offer Mathematics. The girls constitute 60% of the total number of students. If a student is selected at random and is found to be studying Mathematics, the probability that the student is a girl, is **[MP PET 2001]**

(a) $\frac{1}{6}$ (b) $\frac{3}{8}$

(c) $\frac{5}{8}$ (d) $\frac{5}{6}$

126. If two dice are thrown simultaneously then probability that 1 comes on first dice is

(a) $\frac{1}{36}$ (b) $\frac{5}{36}$

(c) $\frac{1}{6}$ (d) None of these

127. If any four numbers are selected and they are multiplied, then the probability that the last digit will be 1, 3, 5 or 7 is **[RPET 2002]**

(a) $\frac{4}{625}$ (b) $\frac{18}{625}$

(c) $\frac{16}{625}$ (d) None of these

128. If a coin be tossed n times then probability that the head comes odd times is

(a) $\frac{1}{2}$ (b) $\frac{1}{2^n}$

(c) $\frac{1}{2^{n-1}}$ (d) None of these

129. The probability that a leap year will have 53 Fridays or 53 Saturdays is

(a) $\frac{2}{7}$ (b) $\frac{3}{7}$

(c) $\frac{4}{7}$ (d) $\frac{1}{7}$

130. Find the probability that the two digit number formed by digits 1, 2, 3, 4, 5 is divisible by 4 (while repetition of digit is allowed)

(a) $\frac{1}{30}$ (b) $\frac{1}{20}$

(c) $\frac{1}{40}$ (d) None of these

131. Two cards are drawn without replacement from a well-shuffled pack. Find the probability that one of them is an ace of heart

(a) $\frac{1}{25}$ (b) $\frac{1}{26}$

(c) $\frac{1}{52}$ (d) None of these

132. A problem in Mathematics is given to three students *A, B, C* and their respective probability of solving the problem is 1/2, 1/3 and 1/4. Probability that the problem is solved is **[RPET 2001; AIEEE 2002]**

(a) $\frac{3}{4}$ (b) $\frac{1}{2}$

(c) $\frac{2}{3}$ (d) $\frac{1}{3}$

133. The chance of getting a doublet with 2 dice is **[Kurukshetra CEE 2002]**

(a) $\frac{2}{3}$ (b) $\frac{1}{6}$

(c) $\frac{5}{6}$ (d) $\frac{5}{36}$

134. The chance of throwing a total of 7 or 12 with 2 dice, is **[Kurukshetra CEE 2002]**

(a) $\frac{2}{9}$ (b) $\frac{5}{9}$

(c) $\frac{5}{36}$ (d) $\frac{7}{36}$

135. There are 10 pairs of shoes in a cupboard from which 4 shoes are picked at random. The probability that there is at least one pair, is

(a) $\frac{99}{323}$ (b) $\frac{224}{323}$

(c) $\frac{100}{323}$ (d) None of these

136. A bag contains 3 red and 7 black balls, two balls are taken out at random, without replacement. If the first ball taken out is red, then what is the probability that the second taken out ball is also red **[Pb. CET 2000]**

(a) $\frac{1}{10}$ (b) $\frac{1}{15}$

(c) $\frac{3}{10}$ (d) $\frac{2}{21}$

137. The probability that a leap year selected randomly will have 53 Sundays is **[MP PET 1991, 93, 9**

(a) $\frac{1}{7}$ (b) $\frac{2}{7}$

(c) $\frac{4}{53}$ (d) $\frac{4}{49}$

138. A bag contains 3 white and 2 black balls and another bag contains 2 white and 4 black balls. A ball is picked up randomly. The probability of its being black is **[MP PET 1989]**

(a) $\frac{2}{5}$ (b) $\frac{8}{15}$

(c) $\frac{6}{11}$ (d) $\frac{2}{3}$

139. A bag x contains 3 white balls and 2 black balls and another bag y contains 2 white balls and 4 black balls. A bag and a ball out of it are picked at random. The probability that the ball is white, is

(a) 3/5 (b) 7/15

(c) 1/2 (d) None of these

140. A box containing 4 white pens and 2 black pens. Another box containing 3 white pens and 5 black pens. If one pen is selected from each box, then the probability that both the pens are white is equal to **[Pb.CET 2002]**

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) $\frac{1}{4}$ (d) $\frac{1}{5}$

141. A bag contains 3 red and 5 black balls and a second bag contains 6 red and 4 black balls. A ball is drawn from each bag. The probability that one is red and other is black, is **[AISSE 1986]**

(a) $\frac{3}{20}$ (b) $\frac{21}{40}$

(c) $\frac{3}{8}$ (d) None of these

142. The probability that a marksman will hit a target is given as 1/5. Then his probability of at least one hit in 10 shots, is

(a) $1-\left(\frac{4}{5}\right)^{10}$ (b) $\frac{1}{5^{10}}$

(c) $1-\frac{1}{5^{10}}$ (d) None of these

143. Four coins are tossed. The probability that at least one head turns up, is

(a) 1/16 (b) 1/4

(c) 15/16 (d) None of these

144. Five horses are in a race. Mr. *A* selects two of the horses at random and bets on them. The probability that Mr. *A* selected the winning horse is **[AIEEE 2003]**

(a) $\frac{4}{5}$ (b) $\frac{3}{5}$

(c) $\frac{1}{5}$ (d) $\frac{2}{5}$

145. '*X*' speaks truth in 60% and '*Y*' in 50% of the cases. The probability that they contradict each other narrating the same incident is

(a) $\frac{1}{4}$ (b) $\frac{1}{3}$

(c) $\frac{1}{2}$ (d) $\frac{2}{3}$

146. The probability that A speaks truth is $\frac{4}{5}$, while this probability for B is $\frac{3}{4}$. The probability that they contradict each other when asked to speak on a fact

[AIEEE 2004; MP PET 1997, 2002; IIT 1975; MNR 1987]

(a) $\frac{4}{5}$ (b) $\frac{1}{5}$

(c) $\frac{7}{20}$ (d) $\frac{3}{20}$

147. Probability of throwing 16 in one throw with three dice is

[UPSEAT 2004]

(a) $\frac{1}{36}$ (b) $\frac{1}{18}$

(c) $\frac{1}{72}$ (d) $\frac{1}{9}$

148. The probability of choosing at random a number that is divisible by 6 or 8 from among 1 to 90 is equal to

[Pb. CET 2002]

(a) $\frac{1}{6}$ (b) $\frac{1}{30}$

(c) $\frac{11}{80}$ (d) $\frac{23}{90}$

149. The probabilities of a problem being solved by two students are $\frac{1}{2},\frac{1}{3}$. Then the probability of the problem being solved is

(a) $\frac{2}{3}$ (b) $\frac{4}{3}$

(c) $\frac{1}{3}$ (d) 1

150. Three houses are available in a locality. Three persons apply for the houses. Each applies for one house without consulting others. The probability that all the three apply for the same house is

(a) $\frac{8}{9}$ (b) $\frac{7}{9}$

(c) $\frac{2}{9}$ (d) $\frac{1}{9}$

151. In a throw of a dice the probability of getting one in even number of throw is

(a) $\frac{5}{36}$ (b) $\frac{5}{11}$

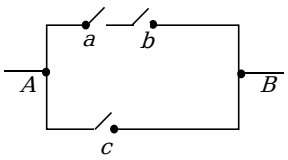
(c) $\frac{6}{11}$ (d) $\frac{1}{6}$

152. A and B are two independent events such that $P(A)=1/2$ and $P(B)=1/3$. Then P (neither A nor B) is equal to **[J & K 2005]**

(a) 2/3 (b) 1/6

(c) 5/6 (d) 1/3

153. Consider the circuit,



If the probability that each switch is closed is p, then find the probability of current flowing through AB **[DCE 2005]**

(a) p^2+p (b) p^3+p-1

(c) p^3+p (d) p^2+p+1

Use of permutations and combinatons in probability

1. Two cards are drawn at random from a pack of 52 cards. The probability that both are the cards of spade is

(a) $\frac{1}{26}$ (b) $\frac{1}{4}$

(c) $\frac{1}{17}$ (d) None of these

2. Six cards are drawn simultaneously from a pack of playing cards. What is the probability that 3 will be red and 3 black

(a) ${}^{26}C_6$ (b) $\frac{{}^{26}C_3}{{}^{52}C_6}$

(c) $\frac{{}^{26}C_3\times{}^{26}C_3}{{}^{52}C_6}$ (d) $\frac{1}{2}$

3. A man draws a card from a pack of 52 playing cards, replaces it and shuffles the pack. He continues this processes until he gets a card of spade. The probability that he will fail the first two times is **[MNR 1980]**

(a) $\frac{9}{16}$ (b) $\frac{1}{16}$

(c) $\frac{9}{64}$ (d) None of these

4. If out of 20 consecutive whole numbers two are chosen at random, then the probability that their sum is odd, is

(a) $\frac{5}{19}$ (b) $\frac{10}{19}$

(c) $\frac{9}{19}$ (d) None of these

5. A bag contains 3 red, 7 white and 4 black balls. If three balls are drawn from the bag, then the probability that all of them are of the same colour is

(a) $\frac{6}{71}$ (b) $\frac{7}{81}$

(c) $\frac{10}{91}$ (d) None of these

6. If four persons are chosen at random from a group of 3 men, 2 women and 4 children. Then the probability that exactly two of them are children, is

[Kurukshetra CEE 1996; DCE 1999]

(a) $\frac{10}{21}$ (b) $\frac{8}{63}$

(c) $\frac{5}{21}$ (d) $\frac{9}{21}$

7. A box contains 25 tickets numbered 1, 2, ... 25. If two tickets are drawn at random then the probability that the product of their numbers is even, is

(a) $\frac{11}{50}$ (b) $\frac{13}{50}$

(c) $\frac{37}{50}$ (d) None of these

8. From a class of 12 girls and 18 boys, two students are chosen randomly. What is the probability that both of them are girls

(a) $\frac{22}{145}$ (b) $\frac{13}{15}$

(c) $\frac{1}{18}$ (d) None of these

9. A word consists of 11 letters in which there are 7 consonants and 4 vowels. If 2 letters are chosen at random, then the probability that all of them are consonants, is

(a) $\frac{5}{11}$ (b) $\frac{21}{55}$

(c) $\frac{4}{11}$ (d) None of these

10. Twenty tickets are marked the numbers 1, 2, ... 20. If three tickets be drawn at random, then what is the probability that those marked 7 and 11 are among them

(a) $\frac{3}{190}$ (b) $\frac{1}{19}$

(c) $\frac{1}{190}$ (d) None of these

11. If Mohan has 3 tickets of a lottery containing 3 prizes and 9 blanks, then his chance of winning prize are

(a) $\frac{34}{55}$ (b) $\frac{21}{55}$

(c) $\frac{17}{55}$ (d) None of these

12. A bag contains 3 white and 7 red balls. If a ball is drawn at random, then what is the probability that the drawn ball is either white or red

(a) 0 (b) $\frac{3}{10}$

(c) $\frac{7}{10}$ (d) $\frac{10}{10}$

13. A bag contains 4 white, 5 red and 6 black balls. If two balls are drawn at random, then the probability that one of them is white is

(a) $\frac{44}{105}$ (b) $\frac{11}{105}$

(c) $\frac{11}{21}$ (d) None of these

14. A bag contains 6 red, 4 white and 8 blue balls. If three balls are drawn at random, then the probability that 2 are white and 1 is red, is

(a) $\frac{5}{204}$ (b) $\frac{7}{102}$

(c) $\frac{3}{68}$ (d) $\frac{1}{13}$

15. A committee of five is to be chosen from a group of 9 people. The probability that a certain married couple will either serve together or not at all, is **[CEE 1993**

(a) $\frac{1}{2}$ (b) $\frac{5}{9}$

(c) $\frac{4}{9}$ (d) $\frac{2}{9}$

16. The letter of the word `ASSASSIN' are written down at random in a row. The probability that no two S occur together is **[BIT Ranchi 1990; IIT 1983]**

(a) $\frac{1}{35}$ (b) $\frac{1}{14}$

(c) $\frac{1}{15}$ (d) None of these

17. The probability of getting 4 heads in 8 throws of a coin, is

(a) $\frac{1}{2}$ (b) $\frac{1}{64}$

(c) $\frac{^8C_4}{8}$ (d) $\frac{^8C_4}{2^8}$

18. In a lottery 50 tickets are sold in which 14 are of prize. A man bought 2 tickets, then the probability that the man win the prize, is

(a) $\frac{17}{35}$ (b) $\frac{18}{35}$

(c) $\frac{72}{175}$ (d) $\frac{13}{175}$

19. A bag contains 8 black and 7 white balls. Two balls are drawn at random. Then for which the probability is more

(a) Both balls are white

(b) One ball is white and one is black

(c) Both balls are black

(d) All of the above are equals

20. A committee has to be made of 5 members from 6 men and 4 women. The probability that at least one woman is present in committee, is

(a) $\frac{1}{42}$ (b) $\frac{41}{42}$

(c) $\frac{2}{63}$ (d) $\frac{1}{7}$

21. A three digit number is formed by using numbers 1, 2, 3 and 4. The probability that the number is divisible by 3, is

(a) $\frac{2}{3}$ (b) $\frac{2}{7}$

(c) $\frac{1}{2}$ (d) $\frac{3}{4}$

22. From a pack of playing cards three cards are drawn simultaneously. The probability that these are one king, one queen and one jack is

(a) $\frac{64}{5525}$ (b) $\frac{16}{5525}$

(c) $\frac{128}{5525}$ (d) $\frac{64}{625}$

23. Word 'UNIVERSITY' is arranged randomly. Then the probability that both 'I' does not come together, is **[UPSEAT 2001]**

(a) $\frac{3}{5}$ (b) $\frac{2}{5}$

(c) $\frac{4}{5}$ (d) $\frac{1}{5}$

24. There are n different objects 1, 2, 3,.....n distributed at random in n places marked 1, 2, 3, ...n. The probability that at least three of the objects occupy places corresponding to their number is

(a) $\frac{1}{6}$ (b) $\frac{5}{6}$

(c) $\frac{1}{3}$ (d) None of these

25. An ordinary cube has four blank faces, one face marked 2 another marked 3. Then the probability of obtaining a total of exactly 12 in 5 throws, is

(a) $\frac{5}{1296}$ (b) $\frac{5}{1944}$

(c) $\frac{5}{2592}$ (d) None of these

26. Two persons each make a single throw with a die. The probability they get equal value is p_1. Four persons each make a single throw and probability of three being equal is p_2, then

(a) $p_1 = p_2$ (b) $p_1 < p_2$

(c) $p_1 > p_2$ (d) None of these

27. n cadets have to stand in a row. If all possible permutations are equally likely, then the probability that two particular cadets stand side by side, is

(a) $\frac{2}{n}$ (b) $\frac{1}{n}$

(c) $\frac{2}{(n-1)!}$ (d) None of these

28. A bag contains tickets numbered from 1 to 20. Two tickets are drawn. The probability that both the numbers are prime, is

(a) $\frac{14}{95}$ (b) $\frac{7}{95}$

(c) $\frac{1}{95}$ (d) None of these

29. A bag contains 6 red, 5 white and 4 black balls. Two balls are drawn. The probability that none of them is red, is **[AI CBSE 1983]**

(a) $\frac{12}{35}$ (b) $\frac{6}{35}$

(c) $\frac{4}{35}$ (d) None of these

30. A bag contains 3 white and 5 black balls. If one ball is drawn, then the probability that it is black, is **[RPET 1995]**

(a) $\frac{3}{8}$ (b) $\frac{5}{8}$

(c) $\frac{6}{8}$ (d) $\frac{10}{20}$

31. Three of the six vertices of a regular hexagon are chosen at random. The probability that the triangle with these three vertices is equilateral, is equal to **[IIT 1995; MP PET 2002, 04]**

(a) $\frac{1}{2}$ (b) $\frac{1}{5}$

(c) $\frac{1}{10}$ (d) $\frac{1}{20}$

32. Three mangoes and three apples are in a box. If two fruits are chosen at random, the probability that one is a mango and the other is an apple is

(a) $\frac{2}{3}$ (b) $\frac{3}{5}$

(c) $\frac{1}{3}$ (d) None of these

33. There are 5 volumes of Mathematics among 25 books. They are arranged on a shelf in random order. The probability that the volumes of Mathematics stand in increasing order from left to right (the volumes are not necessarily kept side by side) is

(a) $\frac{1}{5!}$ (b) $\frac{50!}{55!}$

(c) $\frac{1}{50^5}$ (d) None of these

34. A cricket team has 15 members, of whom only 5 can bowl. If the names of the 15 members are put into a hat and 11 drawn at random, then the chance of obtaining an eleven containing at least 3 bowlers is

(a) $\frac{7}{13}$ (b) $\frac{11}{15}$

(c) $\frac{12}{13}$ (d) None of these

35. A bag has 13 red, 14 green and 15 black balls. The probability of getting exactly 2 blacks on pulling out 4 balls is P_1. Now the number of each colour ball is doubled and 8 balls are pulled out. The probability of getting exactly 4 blacks is P_2. Then

(a) $P_1 = P_2$ (b) $P_1 > P_2$

(c) $P_1 < P_2$ (d) None of these

36. If m rupee coins and n ten paise coins are placed in a line, then the probability that the extreme coins are ten paise coins is

(a) ${}^{m+n}C_m / n^m$ (b) $\frac{n(n-1)}{(m+n)(m+n-1)}$

(c) ${}^{m+n}P_m / m^n$ (d) ${}^{m+n}P_n / n^m$

37. A mapping is selected at random from the set of all the mappings of the set $A = \{1, 2, ..., n\}$ into itself. The probability that the mapping selected is an injection is

(a) $\frac{1}{n^n}$ (b) $\frac{1}{n!}$

(c) $\frac{(n-1)!}{n^{n-1}}$ (d) $\frac{n!}{n^{n-1}}$

38. A lot consists of 12 good pencils, 6 with minor defects and 2 with major defects. A pencil is choosen at random. The probability that this pencil is not defective is **[EAMCET 1991]**

(a) $\frac{3}{5}$ (b) $\frac{3}{10}$

(c) $\frac{4}{5}$ (d) $\frac{1}{2}$

39. A box contains 10 mangoes out of which 4 are rotten. 2 mangoes are taken out together. If one of them is found to be good, the probability that the other is also good is **[EAMCET 1992]**

(a) $\frac{1}{3}$ (b) $\frac{8}{15}$

(c) $\frac{5}{18}$ (d) $\frac{2}{3}$

40. Out of 13 applicants for a job, there are 5 women and 8 men. It is desired to select 2 persons for the job. The probability that at least one of the selected persons will be a woman is

(a) $\frac{25}{39}$ (b) $\frac{14}{39}$

(c) $\frac{5}{13}$ (d) $\frac{10}{13}$

41. Two numbers a and b are chosen at random from the set of first 30 natural numbers. The probability that $a^2 - b^2$ is divisible by 3 is

(a) $\frac{9}{87}$ (b) $\frac{12}{87}$

(c) $\frac{15}{87}$ (d) $\frac{47}{87}$

42. Two friends A and B have equal number of daughters. There are three cinema tickets which are to be distributed among the daughters of A and B. The probability that all the tickets go to daughters of A is 1/20. The number of daughters each of them have is

(a) 4 (b) 5

(c) 6 (d) 3

43. Dialing a telephone number an old man forgets the last two digits remembering only that these are different dialled at random. The probability that the number is dialled correctly, is

(a) $\frac{1}{45}$ (b) $\frac{1}{90}$

(c) $\frac{1}{100}$ (d) None of these

44. In a box there are 2 red, 3 black and 4 white balls. Out of these three balls are drawn together. The probability of these being of same colour is

(a) $\frac{1}{84}$ (b) $\frac{1}{21}$

(c) $\frac{5}{84}$ (d) None of these

45. Six boys and six girls sit in a row randomly. The probability that the six girls sit together

(a) $\frac{1}{77}$ (b) $\frac{1}{132}$

(c) $\frac{1}{231}$ (d) None of these

46. From a group of 7 men and 4 ladies a committee of 6 persons is formed, then the probability that the committee contains 2 ladies is

(a) $\frac{5}{13}$ (b) $\frac{5}{11}$

(c) $\frac{4}{11}$ (d) $\frac{3}{11}$

47. A bag contains 4 white and 3 red balls. Two draws of one ball each are made without replacement. Then the probability that both the balls are red is

(a) $\frac{1}{7}$ (b) $\frac{2}{7}$

(c) $\frac{3}{7}$ (d) $\frac{4}{7}$

48. A bag contains 5 white, 7 black and 4 red balls. Three balls are drawn from the bag at random. The probability that all the three balls are white, is **[MP PET 1997]**

(a) $\frac{3}{16}$ (b) $\frac{3}{5}$

(c) $\frac{1}{60}$ (d) $\frac{1}{56}$

49. Out of 40 consecutive natural numbers, two are chosen at random. Probability that the sum of the numbers is odd, is **[MP PET 1997; Pb. CET 2000]**

(a) $\frac{14}{29}$ (b) $\frac{20}{39}$

(c) $\frac{1}{2}$ (d) None of these

50. The probability that the three cards drawn from a pack of 52 cards are all red is

(a) $\frac{1}{17}$ (b) $\frac{3}{19}$

(c) $\frac{2}{19}$ (d) $\frac{2}{17}$

51. A committee consists of 9 experts taken from three institutions *A, B* and *C*, of which 2 are from *A*, 3 from *B* and 4 from *C*. If three experts resign, then the probability that they belong to different institutions is **[Roorkee Qualifying 1998]**

(a) $\frac{1}{729}$ (b) $\frac{1}{24}$

(c) $\frac{1}{21}$ (d) $\frac{2}{7}$

52. Two numbers are selected at random from 1, 2, 3 .....100 and are multiplied, then the probability correct to two places of decimals that the product thus obtained is divisible by 3, is

(a) 0.55 (b) 0.44

(c) 0.22 (d) 0.33

53. Five digit numbers are formed using the digits 1, 2, 3, 4, 5, 6 and 8. What is the probability that they have even digits at both the ends

(a) $\frac{2}{7}$ (b) $\frac{3}{7}$

(c) $\frac{4}{7}$ (d) None of these

54. A bag contains 3 red, 4 white and 5 black balls. Three balls are drawn at random. The probability of being their different colours is

(a) $\frac{3}{11}$ (b) $\frac{2}{11}$

(c) $\frac{8}{11}$ (d) None of these

55. If four vertices of a regular octagon are chosen at random, then the probability that the quadrilateral formed by them is a rectangle is

(a) $\frac{1}{8}$ (b) $\frac{2}{21}$

(c) $\frac{1}{32}$ (d) $\frac{1}{35}$

56. A bag contains 5 brown and 4 white socks. A man pulls out two socks. The probability that these are of the same colour is

(a) $\frac{5}{108}$ (b) $\frac{18}{108}$

(c) $\frac{30}{108}$ (d) $\frac{48}{108}$

57. If a committee of 3 is to be chosen from a group of 38 people of which you are a member. What is the probability that you will be on the committee

(a) $\binom{38}{3}$ (b) $\binom{37}{2}$

(c) $\binom{37}{2}\Big/\binom{38}{3}$ (d) $\frac{666}{8436}$

58. Four boys and three girls stand in a queue for an interview, probability that they will in alternate position is **[UPSEAT 2001]**

(a) $\frac{1}{34}$ (b) $\frac{1}{35}$

(c) $\frac{1}{17}$ (d) $\frac{1}{68}$

59. In a lottery there were 90 tickets numbered 1 to 90. Five tickets were drawn at random. The probability that two of the tickets drawn numbers 15 and 89 is **[AMU 2001]**

(a) $\frac{2}{801}$ (b) $\frac{2}{623}$

(c) $\frac{1}{267}$ (d) $\frac{1}{623}$

60. Among 15 players, 8 are batsmen and 7 are bowlers. Find the probability that a team is chosen of 6 batsmen and 5 bowlers

(a) $\frac{{}^8C_6 \times {}^7C_5}{{}^{15}C_{11}}$ (b) $\frac{{}^8C_6 + {}^7C_5}{{}^{15}C_{11}}$

(c) $\frac{15}{28}$ (d) None of these

61. A bag contains 5 black balls, 4 white balls and 3 red balls. If a ball is selected randomwise, the probability that it is a black or red ball is

(a) $\frac{1}{3}$ (b) $\frac{1}{4}$

(c) $\frac{5}{12}$ (d) $\frac{2}{3}$

62. Out of 30 consecutive numbers, 2 are chosen at random. The probability that their sum is odd, is **[Kurukshetra CEE 2002]**

(a) $\frac{14}{29}$ (b) $\frac{16}{29}$

(c) $\frac{15}{29}$ (d) $\frac{10}{29}$

63. Three integers are chosen at random from the first 20 integers. The probability that their product is even, is **[Kurukshetra CEE 2002]**

(a) $\frac{2}{19}$ (b) $\frac{3}{29}$

(c) $\frac{17}{19}$ (d) $\frac{4}{19}$

64. Two numbers are selected randomly from the set $S = \{1,2,3,4,5,6\}$ without replacement one by one. The probability that minimum of the two numbers is less than 4 is

(a) $\frac{1}{15}$ (b) $\frac{14}{15}$

(c) $\frac{1}{5}$ (d) $\frac{4}{5}$

65. A bag contains 6 white, 7 red and 5 black balls. If 3 balls are drawn from the bag at random, then the probability that all of them are white is

(a) $\frac{20}{204}$ (b) $\frac{5}{204}$

(c) $\frac{1}{3}$ (d) None of these

66. A bag contains 4 white, 5 red and 6 green balls. Three balls are picked up randomly. The probability that a white, a red and a green ball is drawn is

(a) $\frac{15}{91}$ (b) $\frac{30}{91}$

(c) $\frac{20}{91}$ (d) $\frac{24}{91}$

67. A box contains 10 red balls and 15 green balls. If two balls are drawn in succession then the probability that one is red and other is green, is

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$

(c) $\frac{1}{4}$ (d) None of these

68. Three cards are drawn at random from a pack of 52 cards. What is the chance of drawing three aces

(a) $\frac{3}{5525}$ (b) $\frac{2}{5525}$

(c) $\frac{1}{5525}$ (d) None of these

69. A pack of cards contains 4 aces, 4 kings, 4 queens and 4 jacks. Two cards are drawn at random. The probability that at least one of these is an ace, is

(a) $\frac{9}{20}$ (b) $\frac{3}{16}$

(c) $\frac{1}{6}$ (d) $\frac{1}{9}$

70. A fair coin is tossed 100 times. The probability of getting tails an odd number of times is

(a) $\frac{1}{2}$ (b) $\frac{1}{8}$

(c) $\frac{3}{8}$ (d) None of these

71. 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

72. Ten students are seated at random in a row. The probability that two particular students are not seated side by side is

(a) $\frac{4}{5}$ (b) $\frac{3}{5}$

(c) $\frac{2}{5}$ (d) $\frac{1}{5}$

73. A drawer contains 5 brown socks and 4 blue socks well mixed. A man reaches the drawer and pulls out 2 socks at random. What is the probability that they match

(a) $\frac{4}{9}$ (b) $\frac{5}{8}$

(c) $\frac{5}{9}$ (d) $\frac{7}{12}$

74. 5 persons A, B, C, D and E are in queue of a shop. The probability that A and E always together, is

(a) $\frac{1}{4}$ (b) $\frac{2}{3}$

(c) $\frac{2}{5}$ (d) $\frac{3}{5}$

75. A bag contains 8 red and 7 black balls. Two balls are drawn at random. The probability that both the balls are of the same colour is

(a) $\frac{14}{15}$ (b) $\frac{11}{15}$

(c) $\frac{7}{15}$ (d) $\frac{4}{15}$

76. From eighty cards numbered 1 to 80, two cards are selected randomly. The probability that both the cards have the numbers divisible by 4 is given by **[Pb. CET 2000]**

(a) $\frac{21}{316}$ (b) $\frac{19}{316}$

(c) $\frac{1}{4}$ (d) None of these

77. A basket contains 5 apples and 7 oranges and another basket contains 4 apples and 8 oranges. One fruit is picked out from each basket. Find the probability that the fruits are both apples or both oranges **[AMU 2002]**

(a) $\frac{24}{144}$ (b) $\frac{56}{144}$

(c) $\frac{68}{144}$ (d) $\frac{76}{144}$

78. Let A and B be two finite sets having m and n elements respectively such that $m \le n$. A mapping is selected at random from the set of all mappings from A to B. The probability that the mapping selected is an injection is

(a) $\frac{n!}{(n-m)!n^m}$ (b) $\frac{n!}{(n-m)!n^m}$

(c) $\frac{m!}{(n-m)!n^m}$ (d) $\frac{m!}{(n-m)!m^n}$

79. Suppose $n \ge 3$ persons are sitting in a row. Two of them are selected at random. The probability that they are not together is **[Pb. CET 2004]**

(a) $1-\frac{2}{n}$ (b) $\frac{2}{n-1}$

(c) $1-\frac{1}{n}$ (d) None of these

80. Fifteen persons among whom are A and B, sit down at random at a round table. The probability that there are 4 persons between A and B, is

(a) $\frac{1}{3}$ (b) $\frac{2}{3}$

(c) $\frac{2}{7}$ (d) $\frac{1}{7}$

81. 5 boys and 5 girls are sitting in a row randomly. The probability that boys and girls sit alternatively is **[Kerala (Engg.) 2005]**

(a) 5/126 (b) 1/126
(c) 4/126 (d) 6/125
(e) 1/63

Odds in favour and odds against, Addition theorem on probability

1. If the odds against an event be 2 : 3, then the probability of its occurrence is

(a) $\frac{1}{5}$ (b) $\frac{2}{5}$
(c) $\frac{3}{5}$ (d) 1

2. If the odds in favour of an event be 3 : 5, then the probability of non-occurrence of the event is

(a) $\frac{3}{5}$ (b) $\frac{5}{3}$
(c) $\frac{3}{8}$ (d) $\frac{5}{8}$

3. A card is drawn from a pack of 52 cards. A gambler bets that it is a spade or an ace. What are the odds against his winning this bet

(a) 17 : 52 (b) 52 : 17
(c) 9 : 4 (d) 4 : 9

4. An event has odds in favour 4 : 5, then the probability that event occurs, is

(a) $\frac{1}{5}$ (b) $\frac{4}{5}$
(c) $\frac{4}{9}$ (d) $\frac{5}{9}$

5. For an event, odds against is 6 : 5. The probability that event does not occur, is

(a) $\frac{5}{6}$ (b) $\frac{6}{11}$
(c) $\frac{5}{11}$ (d) $\frac{1}{6}$

6. In a horse race the odds in favour of three horses are $1:2$, $1:3$ and $1:4$. The probability that one of the horse will win the race is

(a) $\frac{37}{60}$ (b) $\frac{47}{60}$
(c) $\frac{1}{4}$ (d) $\frac{3}{4}$

7. The odds against a certain event is 5 : 2 and the odds in favour of another event is 6 : 5. If both the events are independent, then the probability that at least one of the events will happen is

(a) $\frac{50}{77}$ (b) $\frac{52}{77}$
(c) $\frac{25}{88}$ (d) $\frac{63}{88}$

8. If odds against solving a question by three students are 2 : 1, 5 : 2 and 5 : 3 respectively, then probability that the question is solved only by one student is **[RPET 1999]**

(a) $\frac{31}{56}$ (b) $\frac{24}{56}$
(c) $\frac{25}{56}$ (d) None of these

9. Three ships A, B and C sail from England to India. If the ratio of their arriving safely are 2 : 5, 3 : 7 and 6 : 11 respectively then the probability of all the ships for arriving safely is

(a) $\frac{18}{595}$ (b) $\frac{6}{17}$
(c) $\frac{3}{10}$ (d) $\frac{2}{7}$

10. A party of 23 persons take their seats at a round table. The odds against two persons sitting together are **[RPET 1999]**

(a) 10 : 1 (b) 1 : 11
(c) 9 : 10 (d) None of these

11. If two events A and B are such that $P(A+B)=\frac{5}{6}$, $P(AB)=\frac{1}{3}$ and $P(\bar{A})=\frac{1}{2}$, then the events A and B are

(a) Independent
(b) Mutually exclusive
(c) Mutually exclusive and independent
(d) None of these

12. The probabilities of three mutually exclusive events are 2/3, 1/4 and 1/6. The statement is **[MNR 1987;**

(a) True (b) Wrong
(c) Could be either (d) Do not know

13. If A and B are two events such that $P(A)=0.4$, $P(A+B)=0.7$ and $P(AB)=0.2$, then $P(B)=$ **[MP PET 1992]**

(a) 0.1 (b) 0.3
(c) 0.5 (d) None of these

14. 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 $P(A+B)=$ **[MP PET 1992]**

(a) 0.125 (b) 0.25
(c) 0.375 (d) 0.5

15. A card is drawn at random from a pack of cards. The probability of this card being a red or a queen is **[MP PET 1989]**

(a) $\frac{1}{13}$ (b) $\frac{1}{26}$
(c) $\frac{1}{2}$ (d) $\frac{7}{13}$