*** Choose the right answer from the given options. [1 Marks Each]** **[120]**

1. A person write 4 letters and addresses 4 envelopes. If the letters are placed in the envelopes at random, then the probability that all letters are not placed in the right envelopes, is

   (A) $\frac{1}{4}$ (B) $\frac{11}{24}$ (C) $\frac{15}{24}$ (D) $\frac{23}{24}$

2. One card is drawn from a pack of 52 cards.The probability of getting a 10 of black suit is:

   (A) $\frac{1}{26}$ (B) $\frac{1}{13}$ (C) $\frac{3}{26}$ (D) None

3. 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, the probability that it is rusted or is a nail is:

   (A) $\frac{3}{16}$ (B) $\frac{5}{16}$ (C) $\frac{11}{16}$ (D) $\frac{14}{16}$

4. Poonam buys a fish from a shop for her aquarium. The shopkeeper takes out one fish at random from a tank containing 5 male fish and 8 female fish. What is the probability that the fish taken out is a male fish?

   (A) $\frac{5}{13}$ (B) $\frac{1}{4}$ (C) $\frac{1}{5}$ (D) $\frac{5}{14}$

5. A box contains 3 red, 3 white and 3 green balls. A ball is selected at random. Find the probability that the ball picked up is neither a white nor a red ball:

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

6. Three integers are chosen at random from the first 20 integers. The probability that their product is even is:

   (A) $\frac{2}{19}$ (B) $\frac{3}{29}$ (C) $\frac{17}{19}$ (D) $\frac{4}{19}$

7. Choose the correct answer.
   Without repetition of the numbers, four digit numbers are formed with the numbers 0, 2, 3, 5. The probability of such a number divisible by 5 is:

   (A) $\frac{1}{5}$ (B) $\frac{4}{5}$ (C) $\frac{1}{30}$ (D) $\frac{5}{9}$

8. 20 cards are numbered from 1 to 20. If one card is drawn at random, what is the probability that the number on the card is a prime number?

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

9. Four persons are selected at random out of 3 men, 2 women and 4 children. The probability that there are exactly 2 children in the selection is:

   (A) $\frac{11}{21}$ (B) $\frac{9}{21}$ (C) $\frac{10}{21}$ (D) None of these

10. All the three face cards of spades are removed from a well-shuffled pack of 52 cards. A card is then drawn at random from the remaining pack. Find the probability of getting black face card:

(A) $\frac{6}{49}$ (B) $\frac{3}{49}$ (C) $\frac{5}{49}$ (D) $\frac{4}{49}$

11. The probabilities of happening of two events A and B are 0.25 and 0.50 respectively. If the probability of happening of A and B together is 0.14, then probability that neither A nor B happens is:

(A) 0.39 (B) 0.29 (C) 0.11 (D) None of these.

12. Choose the correct answer.
While shuffling a pack of 52 playing cards, 2 are accidentally dropped. Find the probability that the missing cards to be of different colours:

(A) $\frac{29}{52}$ (B) $\frac{1}{2}$ (C) $\frac{26}{51}$ (D) $\frac{27}{51}$

13. A and B are two events such that P (A) = 0.25 and P (B) = 0.50. The probability of both happening together is 0.14. The probability of both A and B not happening is

(A) 0.39 (B) 0.2 (C) 0.11 (D) none of these.

14. What is the probability of selecting a vowel in the word "PROBABILITY"?

(A) $\frac{2}{11}$ (B) $\frac{3}{11}$ (C) $\frac{4}{11}$ (D) $\frac{5}{11}$

15. 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

16. If events A and B are independent and P(A) = 0.15, P(A ∪ B) = 0.45, then P(B)=:

(A) 136 (B) 176 (C) 196 (D) 236

17. Two dice are thrown simultaneously. Find the probability of getting a multiple of 2 on first dice and a multiple of 3 on the second dice.

(A) $\frac{4}{6}$ (B) $\frac{2}{6}$ (C) $\frac{1}{6}$ (D) $\frac{1}{36}$

18. 6 boys and 6 girls sit in a row at random. The probability that all the girls sit together is

(A) $\frac{1}{432}$ (B) $\frac{12}{431}$ (C) $\frac{1}{132}$ (D) none of these

19. The probability of getting a total of 10 in a single throw of two dices is:

(A) $\frac{1}{9}$ (B) $\frac{1}{12}$ (C) $\frac{1}{6}$ (D) $\frac{5}{36}$

20. Five persons entered the lift cabin on the ground floor of an 8 floor house. Suppose that each of them independently and with equal probability can leave the cabin at any floor beginning with the first, then the probability of all 5 persons leaving at different floor is:

(A) $\frac{{}^{7}\mathrm{P}_{5}}{7^{5}}$ (B) $\frac{7^{5}}{{}^{7}\mathrm{P}_{5}}$ (C) $\frac{6}{{}^{6}\mathrm{P}_{5}}$ (D) $\frac{{}^{5}\mathrm{P}_{5}}{5^{5}}$

21. If three dice are throw simultaneously, then the probability of getting a score of 5 is:

(A) $\frac{5}{216}$ (B) $\frac{1}{6}$ (C) $\frac{1}{36}$ (D) None of these

22. 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) $\frac{1}{7}$

23. There are 30 tickets numbered from 1 to 30 in a box . A ticket is drawn at random. What is the probability that the ticket drawn bears an odd number?

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

24. Find the sample space for choosing a prime number less than 2020 at random.

(A) 2, 3, 5, 7, 11, 13, 17, 19 (B) 2, 3, 4, 5, 7, 11, 13, 17, 19

(C) 2, 3, 5, 7, 11, 13, 17, 19, 20 (D) 2, 3, 5, 7, 11, 13, 17, 19, 15

25. Two numbers are chosen from {1, 2, 3, 4, 5, 6} one after another without replacement. Find the probability that the smaller of the two is less than 4.

(A) $\frac{4}{5}$ (B) $\frac{1}{15}$ (C) $\frac{1}{5}$ (D) $\frac{14}{15}$

26. A die is thrown then find the probability of getting a number greater than 3.

(A) $\frac{1}{3}$ (B) $\frac{1}{2}$ (C) $\frac{2}{3}$ (D) 0

27. Let A and B are two mutually exclusive events and if P(A) = 0.5 and P($\bar{B}$) =0.6 then P(AUB) is:

(A) 0 (B) 1 (C) 0.6 (D) 0.9

28. If two coins are tossed then find the probability of the events that at the most one tail turns up:

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

29. Choose the correct answer.
6 boys and 6 girls sit in a row at random. The probability that all the girls sit together is:

(A) $\frac{1}{432}$ (B) $\frac{12}{431}$ (C) $\frac{1}{132}$ (D) none of these.

30. One of the two events must occur. If the chance of one is $\frac{2}{3}$ of the other, then odds in favour of the other are

(A) $1:3$ (B) $3:1$ (C) $2:3$ (D) $3:2$

31. Two dice are thrown together. The probability that neither they show equal digits nor the sum of their digits is 9 will be:

(A) $\frac{13}{15}$ (B) $\frac{13}{18}$ (C) $\frac{1}{9}$ (D) $\frac{8}{9}$

32. A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. The probability that none of the balls drawn is blue is:

(A) $\frac{10}{21}$ (B) $\frac{11}{21}$ (C) $\frac{2}{7}$ (D) $\frac{5}{7}$

33. Two unbiased coins are tossed simultaneously. Find the probability of getting at least one head.

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{3}{4}$ (D) None of these

34. If $\frac{(1-3P)}{2}, \frac{(1+4P)}{3}, \frac{(1+P)}{6}$ are the probabilities of three mutually exclusive and exhaustive events, then the set of all values of *p* is:

(A) $(0,1)$ (B) $\left(\frac{-1}{4}, \frac{1}{3}\right)$ (C) $\left(0, \frac{1}{3}\right)$ (D) $(0,\infty)$

35. 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 them is an ace is

(A) $\frac{1}{5}$ (B) $\frac{3}{16}$ (C) $\frac{9}{20}$ (D) $\frac{1}{9}$

36. Two dice are thrown simultaneously. The probability of getting a pair of aces is

(A) $\frac{1}{36}$ (B) $\frac{1}{3}$ (C) $\frac{1}{6}$ (D) none of these

37. Two dice are thrown simultaneously. The probability of obtaining total score of seven is:

(A) $\frac{5}{36}$ (B) $\frac{6}{36}$ (C) $\frac{7}{36}$ (D) $\frac{8}{36}$

38. One card is drawn from a pack of 52 cards. The probability that it is the card of a king or spade is:

(A) $\frac{1}{26}$ (B) $\frac{3}{26}$ (C) $\frac{4}{13}$ (D) $\frac{3}{13}$

39. Three digit numbers are formed using the digits 0, 2, 4, 6, 8. A number is chosen at random out of these numbers. What is the probability that this number has the same digits?

(A) $\frac{1}{16}$ (B) $\frac{16}{25}$ (C) $\frac{1}{645}$ (D) $\frac{1}{25}$

40. Sample space is a set of ..... of an experiment.

(A) All possible outcomes (B) Selected outcomes

(C) Both (D) None of these

41. Three numbers are chosen from 1 to 20. The probability that they are not consecutive is:

(A) $\frac{186}{190}$ (B) $\frac{187}{190}$ (C) $\frac{188}{190}$ (D) $\frac{18}{{}^{20}C_3}$

42. If A, B, C are three mutually exclusive and exhaustive events of an experiment such that $3\,P(A) = 2P(B) = C,$ then P(A) is equal to:

(A) $\frac{1}{11}$ (B) $\frac{2}{11}$ (C) $\frac{5}{11}$ (D) $\frac{6}{11}$

43. Two dice are thrown together. The probability that at least one will show its digit greater than 3 is:

(A) $\frac{1}{4}$ (B) $\frac{3}{4}$ (C) $\frac{1}{2}$ (D) $\frac{1}{8}$

44. One coin is tossed once. Find the probability of getting A tail.

(A) $\frac{1}{2}$ (B) 1 (C) Data insufficient (D) None of these

45. Choose the correct answer.
The probability that at least one of the events A and B occurs is 0.6. If A and B occur simultaneously with probability 0.2, then $\mathrm{P}(\bar{\mathrm{A}})+\mathrm{P}(\bar{\mathrm{B}})$ is:
(A) 0.4 (B) 0.8 (C) 1.2 (D) 1.6

46. If a coin is tossed till the first head appears, then what will be the sample space?
(A) {H} (B) {TH}
(C) {T, TH, HHT, HHHT, ...} (D) {H, TH, TTH, TTTH, ...}

47. One card is drawn from a pack of 52 cards. The probability of getting a jack card is:
(A) $\frac{1}{13}$ (B) $\frac{2}{13}$ (C) $\frac{3}{13}$ (D) $\frac{4}{13}$

48. Two unbiased coins are tossed simultaneously. Find the probability of getting at most one head.
(A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) $\frac{1}{3}$

49. Probability is 0.45 that a dealer will sell at least 20 television sets during a day, and the probability is 0.74 that he will sell less that 24 televisions. The probability that he will sell 20, 21, 22 or 23 televisions during the day, is:
(A) 0.19 (B) 0.32 (C) 0.21 (D) None of these

50. Six boys and six girls sit in a row at random. The probability that the boys and girls sit alternatively is:
(A) $\frac{1}{462}$ (B) $\frac{11}{462}$ (C) $\frac{5}{51}$ (D) $\frac{7}{123}$

51. Choose the correct answer.
If the probabilities for A to fail in an examination is 0.2 and that for B is 0.3, then the probability that either A or B fails is:
(A) >0.5 (B) 0.5 (C) ≤ 0.5 (D) 0

52. Without repetition of the numbers, four digit numbers are formed with the numbers 0, 2, 3, 5. The probability of such a number divisible by 5 is:
(A) $\frac{1}{5}$ (B) $\frac{4}{5}$ (C) $\frac{1}{30}$ (D) $\frac{5}{9}$

53. Two unbiased coins are tossed simultaneously. The probability of getting at least one head is:
(A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{3}{4}$ (D) none

54. A die is rolled, then the probability that an even number is obtained is:
(A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) $\frac{1}{4}$ (D) $\frac{3}{4}$

55. A box contains 10 good articles and 6 with defects. One item is drawn at random. The probability that it is either good or has a defect is:

(A) $\frac{64}{64}$ (B) $\frac{49}{64}$ (C) $\frac{40}{64}$ (D) $\frac{24}{64}$

56. The probability that the leap year will have 53 sundays and 53 monday is:

(A) $\frac{2}{3}$ (B) $\frac{1}{2}$ (C) $\frac{2}{7}$ (D) $\frac{1}{7}$

57. Choose the correct answer.
Three numbers are chosen from 1 to 20. Find the probability that they are not consecutive:

(A) $\frac{186}{190}$ (B) $\frac{187}{190}$ (C) $\frac{188}{190}$ (D) $\frac{18}{{}^{20}C_3}$

58. In tossing a coin, the chance of throwing head and tail alternatively in 3 successive trials is:

(A) $\frac{1}{4}$ (B) $\frac{1}{6}$ (C) $\frac{1}{5}$ (D) $\frac{1}{48}$

59. A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn. Then the probability that they both are diamonds is:

(A) $\frac{84}{452}$ (B) $\frac{48}{452}$ (C) $\frac{84}{452}$ (D) $\frac{84}{452}$

60. If the integers m and n are chosen at random between 1 and 100, then the probability that the number of the from $7^m + 7^n$ is divisible by 5 equals:

(A) $\frac{1}{4}$ (B) $\frac{1}{7}$ (C) $\frac{1}{8}$ (D) $\frac{1}{49}$

61. If S is the sample space and $P(A) = \frac{1}{3}P(B)$ and $S = A \cup B$ where A and B are two mutually exclusive events, then P (A) =

(A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) $\frac{3}{8}$

62. Two dice are thrown the events A, B, C are as follows A: Getting an odd number on the first die. B: Getting a total of 7 on the two dice. C: Getting a total of greater than or equal to 8 on the two dice. Then AUB is equal to

(A) 15 (B) 17 (C) 19 (D) 21

63. A die is rolled. What is the probability that an even number is obtained?

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

64. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting a face card.

(A) $\frac{1}{13}$ (B) $\frac{1}{26}$ (C) $\frac{3}{13}$ (D) None of these

65. In a simultaneous throw of two dice what is the probability of getting a doublet ?

(A) $\frac{1}{6}$ (B) $\frac{1}{4}$ (C) $\frac{3}{4}$ (D) $\frac{2}{3}$

66. The probabilities of three mutually exclusive events A, B and C are given by $\frac{2}{3}$, $\frac{1}{4}$ and $\frac{1}{6}$respectively. The statement

(A) Is true. (B) Is false.

(C) Nothing can be said. (D) Could be either.

67. If the probability for A to fail in an examination is 0.2 and that for B is 0.3, then the probability that either A or B fails is:

(A) > 0.5 (B) 0.5 (C) ≤ 0.5 (D) 0

68. Two dice are thrown:
P is the event that the sum of the scores on the uppermost faces is a multiple of 6.
Q is the event that the sum of the scores on the uppermost faces is at least 10.
R is the event that same scores on both dice.
Which of the following pairs is mutually exclusive?

(A) P, Q (B) P, R (C) Q, R (D) None of these

69. All possible outcomes of a random experiment forms the:

(A) Events (B) Sample space (C) Both (D) None of these

70. Seven white balls and three black balls are randomly placed in a row. The probability that no two black balls are placed adjacently equals:

(A) $\frac{1}{2}$ (B) $\frac{7}{15}$ (C) $\frac{2}{15}$ (D) $\frac{1}{3}$

71. If 4-digit numbers greater than 5000 are randomly formed from the digits 0, 1, 3, 5 and 7, then the probability of forming a number divisible by 5 when the digits are repeated is:

(A) $\frac{1}{5}$ (B) $\frac{2}{5}$ (C) $\frac{3}{5}$ (D) $\frac{4}{5}$

72. Choose the correct answer.
In a non-leap year, the probability of having 53 tuesdays or 53 wednesdays is:

(A) $\frac{1}{7}$ (B) $\frac{2}{7}$ (C) $\frac{3}{7}$ (D) none os these.

73. What is the total number of sample spaces when a die is thrown 2 times?

(A) 6 (B) 12 (C) 18 (D) 36

74. Let S be the sample space of all five digit numbers.If p is the probability that a randomly selected number from S, is a multiple of 7 but not divisible by 5 , then $9\,p$ is equal to.

(A) 1.0146 (B) 1.2085 (C) 1.0285 (D) 1.1521

75. The probability, that in a randomly selected $3-$digit number at least two digits are odd, is

(A) $\frac{19}{36}$ (B) $\frac{15}{36}$ (C) $\frac{13}{36}$ (D) $\frac{23}{36}$

76. If the probability that a randomly chosen 6-digit number formed by using digits 1 and 8 only is a multiple of 21 is p, then $96\,p$ is equal to

(A) 30 (B) 33 (C) 40 (D) 43

77. In an examination, there are 10 true-false type questions. Out of 10 , a student can guess the answer of 4 questions correctly with probability $\frac{3}{4}$ and the

remaining 6 questions correctly with probability $\frac{1}{4}$. If the probability that the student guesses the answers of exactly 8 questions correctly out of 10 is $\frac{27k}{4^{10}}$, then k is equal to

(A) 598 (B) 487 (C) 412 (D) 479

78. Let E_1, E_2, E_3 be three mutually exclusive events such that $P(E_1) = \frac{2+3p}{6}, P(E_2) = \frac{2-p}{8}$ and $P(E_3) = \frac{1-p}{2}$. If the maximum and minimum values of p are p_1 and p_2, then $(p_1 + p_2)$ is equal to.

(A) $\frac{2}{3}$ (B) $\frac{5}{3}$ (C) $\frac{5}{4}$ (D) 1

79. 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

(A) $\frac{197}{200}$ (B) $\frac{27}{100}$ (C) $\frac{83}{100}$ (D) None of these

80. 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

(A) $\frac{1}{5}$ (B) $\frac{3}{5}$ (C) $\frac{3}{40}$ (D) $\frac{29}{40}$

81. 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

(A) $\frac{1}{12}$ (B) $\frac{1}{6}$ (C) $\frac{1}{3}$ (D) $\frac{2}{3}$

82. 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

83. 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

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

(A) $\frac{2}{3}$ (B) $\frac{3}{4}$ (C) $\frac{4}{5}$ (D) $\frac{3}{5}$

85. 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

86. 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) $\frac{30}{168}$

87. 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

(A) $\frac{1}{7}$ (B) $\frac{2}{7}$ (C) $\frac{3}{7}$ (D) None of these

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

(A) $\frac{19}{24}$ (B) $\frac{21}{23}$ (C) $\frac{23}{24}$ (D) $\frac{1}{24}$

89. 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) $\frac{3}{5}$

90. Three persons work independently on a problem. If the respective probabilities that they will solve it are $\frac{1}{3}, \frac{1}{4}$ and $\frac{1}{5}$, then the probability that none can solve it

(A) $\frac{2}{5}$ (B) $\frac{3}{5}$ (C) $\frac{1}{3}$ (D) None of these

91. 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

(A) $\frac{1}{2}$ (B) $\frac{1}{12}$ (C) $\frac{1}{4}$ (D) None of these

92. Word '$UNIVERSITY$' is arranged randomly. Then the probability that both 'I' does not come together, is

(A) $\frac{3}{5}$ (B) $\frac{2}{5}$ (C) $\frac{4}{5}$ (D) $\frac{1}{5}$

93. 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

94. A box contains 25 tickets numbered $1, 2, \ldots\ldots 25$. 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

95. 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

(A) $\frac{10}{21}$ (B) $\frac{8}{63}$ (C) $\frac{5}{21}$ (D) $\frac{9}{21}$

96. 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

97. 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

98. 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

(A) $\frac{9}{16}$ (B) $\frac{1}{16}$ (C) $\frac{9}{64}$ (D) None of these

99. A and B are two independent events such that $P(A)=\frac{1}{2}$ and $P(B)=\frac{1}{3}$. Then P (neither A nor B) is equal to

(A) $2/3$ (B) $1/6$ (C) $5/6$ (D) $1/3$

100. 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

101. '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) $\frac{2}{3}$

102. 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

103. 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

(A) $\frac{1}{10}$ (B) $\frac{1}{15}$ (C) $\frac{3}{10}$ (D) $\frac{2}{21}$

104. 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

105. 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

106. 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) $\frac{1}{7}$

107. 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

(A) $\frac{5}{24}$ (B) $\frac{5}{64}$ (C) $\frac{3}{32}$ (D) $\frac{3}{16}$

108. 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

(A) $\frac{243}{1024}$ (B) $\frac{781}{1024}$ (C) $\frac{1}{1024}$ (D) $\frac{1023}{1024}$

109. 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) $\frac{1}{6}$

110. Three dice are rolled. If the probability of getting different numbers on the three dice is $\frac{p}{q}$, where p and q are co-prime, then $q-p$ is equal to

(A) 4 (B) 3 (C) 1 (D) 2

111. Let a die be rolled n times. Let the probability of getting odd numbers seven times be equal to the probability of getting odd numbers nine times. If the probability of getting even numbers twice is $\frac{k}{2^{15}}$, then k is equal to:

(A) 30 (B) 90 (C) 15 (D) 60

112. 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

113. Two dice are thrown 5 times, and each time the sum of the numbers obtained being 5 is considered a success. If the probability of having at least 4 successes is $\frac{\mathrm{k}}{3^{11}}$, then k is equal to

(A) 82 (B) 123 (C) 164 (D) 75

114. A bag contains six balls of different colours. Two balls are drawn in succession with replacement. The probability that both the balls are of the same colour is p. Next four balls are drawn in succession with replacement and the probability that exactly three balls are of the same colours is q. If $p:q=m:n$, where m and n are coprime, then $m+n$ is equal to ..... .

(A) 15 (B) 14 (C) 13 (D) 12

115. If an unbiased die, marked with $-2,-1,0,1,2,3$ on its faces, is through five times, then the probability that the product of the outcomes is positive, is :

(A) $\frac{881}{2592}$ (B) $\frac{521}{2592}$ (C) $\frac{440}{2592}$ (D) $\frac{27}{288}$

116. Let A be the event that the absolute difference between two randomly choosen real numbers in the sample space $[0,60]$ is less than or equal to a. If $P(A)=\frac{11}{36}$, then a is equal to ..... .

(A) 100 (B) 0.1 (C) 15 (D) 10

117. Let M be the maximum value of the product of two positive integers when their sum is 66. Let the sample space $S=\left\{x \in Z: x(66-x) \geq \frac{5}{9} M\right\}$ and the event $A=\{x \in S: x$ is a multiple of $3\}$. Then $P(A)$ is equal to

(A) $\frac{15}{44}$ (B) $\frac{1}{3}$ (C) $\frac{1}{5}$ (D) $\frac{7}{22}$

118. Let a biased coin be tossed 5 times. If the probability of getting 4 heads is equal to the probability of getting 5 heads, then the probability of getting atmost two heads is

(A) $\frac{275}{6^5}$ (B) $\frac{36}{5^4}$ (C) $\frac{181}{5^5}$ (D) $\frac{46}{6^4}$

119. Out of 60% female and 40% male candidates appearing in an exam, 60% candidates qualify it. The number of females qualifying the exam is twice the number of males qualifying it. A candidate is randomly chosen from the qualified candidates. The probability, that the chosen candidate is a female, is.

(A) $\frac{13}{16}$ (B) $\frac{11}{16}$ (C) $\frac{23}{32}$ (D) $\frac{2}{3}$

120. Let $S=\{1,2,3,\ldots,2022\}$. Then the probability, that a randomly chosen number n from the set S such that $\mathrm{HCF}(n,2022)=1$, is.

(A) $\frac{128}{1011}$ (B) $\frac{166}{1011}$ (C) $\frac{127}{337}$ (D) $\frac{112}{337}$

*** Given section consists of questions of 3 marks each.** **[60]**

121. box contains 6 red marbles numbered 1 through 6 and 4 white marble numbered form 12 through 15. find the probability that a marble drawn is:
    i. White
    ii. White and odd numbered
    iii. Even numbered
    iv. Red or even numbered.

122. A box contains 10 white, 6 red and 10 black balls. A ball is drawn at random from the box. What is the probability that the ball drawn is either white or red?

123. The probability that a person will travel by plane is $\frac{3}{5}$ and that he will travel by trains is $\frac{1}{4}$. What is the probability that he (she) will travel by plane or train?

124. In a race, the odds in favour of horses A, B, C, D are 1 : 3, 1 : 4, 1 : 5 and 1 : 6 respectively. Find probability that one of them wins the race.

125. In an entrance test that is graded on the basis of two examinations, the probability of a randomly chosen student passing the first examination is 0.8 and the probability of passing the second examination is 0.7. The probability of passing at least one of them is 0.95. What is the probability of passing both?

126. There are four men and six women on the city councils. if one council member is selected for a committee at random, how likel6y is that it is a women?

127. A box contains 30 bolts and 40 nuts. Half of the bolts and half of the nuts are rusted. If two items are drawn at random, what is the probability that either both are rusted or both are bolts?

128. In a lottary, a person chooses six different numbers at random from 1 to 20, and if these six numbers match with six numbers already fixed by the lottery commitee, he wins the prize what is a probability of winning the prize in the game?

129. Tickets numbered form 1 to 20 are mixed up together and then a ticket is drawn at random,what is the probability that the ticket has a number which is a multiple of 3 or 7?

130. A bag contains tickets numbered from 1 to 20. Two tickets are drawn. Find the probability that (i) both the tickets have prime numbers on them (ii) on one there is a prime number and on the other there is a multiple of 4.

131. Six new employees, two of whom are married to each other, are to be assigned six desks that are lined up in a row. If the assignment of employees to desks is made randomly, what is the probability that the married couple will have nonadjacent desks?
[**Hint:** First find the probability that the couple has adjacent desks, and then subtract it from 1]

132. An experiment consists of rolling a die until a 2 appears.
How many elements of the sample space correspond to the event that the 2 appears not later than the k^{th} roll of the die?
[**Hint:** $1 + 5 + 52 + \ldots + 5^{k-1}$]

133. If the letters of the word ASSASSINATION are arranged at random. Find the Probability that:
Two I's and two N's come together.

134. If the letters of the word ASSASSINATION are arranged at random. Find the Probability that:
All A's are not coming together.

135. A bag contains 8 red and 5 white balls. Three balls are drawn at random. Find the Probability that:
    a. All the three balls are white.
    b. All the three balls are red.
    c. One ball is red and two balls are white.

136. One urn contains two black balls (labelled B_1 and B_2) and one white ball. A second urn contains one black ball and two white balls (labelled W_1 and W_2). Suppose the following experiment is performed. One of the two urns is chosen at random. Next a ball is randomly chosen from the urn. Then a second ball is chosen at random from the same urn without replacing the first ball:
    a. Write the sample space showing all possible outcomes.
    b. What is the probability that two black balls are chosen?

c. What is the probability that two balls of opposite colour are chosen?

137. If the letters of the word ALGORITHM are arranged at random in a row what is the probability the letters GOR must remain together as a unit?

138. If the letters of the word ASSASSINATION are arranged at random. Find the Probability that:
Four S's come consecutively in the word.

139. If the letters of the word ASSASSINATION are arranged at random. Find the Probability that:
No two A's are coming together.

140. Suppose an integer from 1 through 1000 is chosen at random, find the probability that the integer is a multiple of 2 or a multiple of 9.

*** Given section consists of questions of 5 marks each.** **[50]**

141. 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. 1 boys and 2 girls?
    iv. At least one girl?
    v. At most one girl?

142. A box contains 10 red marbles, 20 blue marbles and 30 green marbles. 5 marbles are drawn at random. from the box, what is the probability that:
    i. All are blue?
    ii. At least one is green?

143. 20 cards are numbered form 1 to 20. card is drawn at random. what is the probability that trhe number on the card is:
    i. A multiple of 4?
    ii. Not a multiple of 4?
    iii. odd?
    iv. Greather than 12?
    v. Divisible by 5?
    vi. Not a multiple of 6?

144. An integer is chosen at random from first 200 positive integers. Find the probability that the integer is divisible by 6 or 8.

145. Suppose an integer from 1 through 1000 is chosen at random, find the probability that the integer is a multiple of 2 or a multiple of 9.

146. The probability that a student will pass the final examination in both English and Hindi is 0.5 and the probability of passing neither is 0.1. If the probability of

passing the English Examination is 0.75. What is the probability of passing the Hindi Examination?

147. Five cards are drawn from form a pack of 52 cards. what is the chance that these 5 will contain:
    i. Just one ace
    ii. At least one ace.

148. In a large metropolitan area, the probabilities are 0.87, 0.36, 0.30 that a family (randomly chosen for a sample survey) owns a colour television set, a black and white television set, or both kinds of sets. What is the probability that a family owns either any one or both kinds of sets?

149. Match the proposed probability under Column C_1 with the appropriate written description under column C_2:

	C_1		C_2
	Probability		**Written Description.**
a.	0.95	i.	An incorrect assignment.
b.	0.02	ii.	No chance of happening.
c.	-0.3	iii.	As much chance of happening as not.
d.	0.5	iv.	Very likely to happen.
e.	0	v.	Very little chance of happening.

150. Four candidates A, B, C, D have applied for the assignment to coach a school cricket team. If A is twice as likely to be selected as B, and B and C are given about the same chance of being selected, while C is twice as likely to be selected as D, what are the probabilities that:
    a. C will be selected?
    b. A will not be selected?

----- Every failure is a new lesson, and every lesson is a key to new success.” -----