**Probability**

**Type – 1**

**Choose the most appropriate option (a, b, c or d).**

Q 1. Five boys three girls are seated at random in a row. The probability that no boy sits between girls is

(a)  (b)  (c)  (d) none of these

Q 2. In a convex hexagon two diagonals are drawn at random. The probability that the diagonals intersect at an interior point of the hexagon is

(a)  (b)  (c)  (d) none of these

Q 3. 4 five–rupee coins, 3 two–rupee coins and 2 one–rupee coins are stacked together in a column at random. The probability that the coins of the same denomination are consecutive is

(a)  (b)  (c)  (d) none of these

Q 4. Two cards are drawn at random from a pack of 52 cards. The probability of getting at least a spade and an ace is

(a)  (b)  (c)  (d) 

Q 5. A five–digit number is written down at random. The probability that the number is divisible by 5 no two consecutive digits are identical, is

(a)  (b)  (c)  (d) none of these

Q 6. If the letters of the words ATTEMPT are written down at random, the chance that all Ts are consecutive is

(a) s  (b)  (c)  (d) none of these

Q 7. In a single cast with two dice the odds against drawing 7 is

(a)  (b)  (c) 5 : 1 (d) 1 : 5

Q 8. 7 white balls and 3 black balls are placed in a row at random. The probability that no two black balls are adjacent is

(a)  (b)  (c)  (d) 

Q 9. 10 apples are distributed at random among 6 person. The probability that at least one of them will receive none of these is

(a)  (b)  (c)  (d) none of these

Q 10. 4 gentlemen and 4 ladies take sets at random round a table. The probability that they are sitting a alternately is

(a)  (b)  (c)  (d) 

Q 11. Let x = 33”. The index n is given a positive integral value at random . The probability that the value of x will have 3 in the units place is

(a)  (b)  (c)  (d) none of these

Q 12. Three dice are thrown simultaneously. The probability of getting a sum of 15 is

(a)  (b)  (c)  (d) none of these

Q 13. Three dice are thrown. The probability of getting a sum which is a perfect square is

(a)  (b)  (c)  (d) none of these

Q 14. The probability of getting a sum of 12 in four throws of an ordinary dice is

(a)  (b)  (c)  (d) none of these

Q 15. Three different numbers are a selected at random from the set A = {1, 2, 3,….. ,10}. The probability that the product of two of the numbers is equal to the third is

(a)  (b)  (c)  (d) none of these

Q 16. There are 7 seats in a row. Three persons take seats at random. The probability that the middle seat is always occupied and no two persons are consecutive is

(a)  (b)  (c)  (d) none of these

Q 17. A second-order determinant is written down at random using the numbers 1, -1 as elements. The probability that the value of the

(a)  (b)  (c)  (d) 

Q 18. x1, x2,x3,...x50 are fifty real numbers such that xr < xr+1 for r = 1,2, 3,...., 49. Five numbers out of these are picked up at random. Then probability that the five numbers have x20 have x20 as the middle number is

(a)  (b)  (c)  (d) none of these

Q 19.Numbers 1, 2, 3, ... , 100 are written down on each of the cards A, B and C. One number is selected at random from each of the cards. Then probability that the

numbers so selected can be the measures (in cm) of three sides of right-angled triangles no two of which are similar, is

(a)  (b)  (c)  (d) none of these

Q 20. Three numbers are chosen at random without replacement from the set A = {x | 1 ≤ x ≤ 10, x ∈ N). The probability that the minimumof the chosen numbers is 3 and maximum is 7, is

(a)  (b)  (c)  (d) none of these

Q 21. Three natural numbers are taken at random from the set A = {x|1 ≤ x ≤ 100, x ∈ N}. The probability that the AM of the numbers taken is 25 is

(a)  (b)  (c)  (d) none of these

Q 22. Let S be the universal set and n(X) = it. The probability of selecting two subsets A and B of the set X such that B = is

(a)  (b)  (c)  (d) 

Q 23. From a group of 10 persons consisting of 5 lawyers, 3 doctors and 2 engineers, four persons are selected at random. The probability that the selection contains at least one of each category is

(a)  (b)  (c)  (d) none of these

Q 24. 10 different books and 2 different pens are given to 3 boys sp that each gets equal number of things. The probability that the same boy does not receive both the pens is

(a)  (b)  (c)  (d) 

Q 25. Two distinct numbers are selected at random from the first twelve natural numbers. The probability that the sum will be divisible 3 is

(a)  (b)  (c)  (d) none of these

Q 26. The probability of a number n showing in a throw of a dice marked 1 to 6 is proportional to n. Then the probability of the number 3 showing in a throw is

(a)  (b)  (c)  (d) 

Q 27. The probability that out of 10 persons, all born in April, at least two have the same birthday is

(a)  (b)  (c)  (d) none of these

Q 28. If one ball is drawn at random from each of the three boxes containing 3 white and 1 black, 2 white and 2 black, 1 white and 3 black balls then the probability that 2 white and 1 black balls will be drawn is

(a)  (b)  (c)  (d) 

Q 29. A draws two cards at random from a pack of 52 cards. After returning them to the pack and shuffling it, B draws two cards at random. The probability that their draws contain exactly one common card is

(a)  (b)  (c)  (d) none of these

Q 30. A and B draw two cards each, one after another, from a pack of well-shuffled pack of 52 cards. The probability that all the four cards drawn are of the same suit is

(a)  (b)  (c)  (d) none of these

Q 31. Three numbers are chosen at random without replacement from 1,2,3,..., 10. The probability that the minimum of the chosen numbers is 4 or their maximum is 8, is

(a)  (b)  (c)  (d) none of these

Q 32. A man draws a card from a pack of 52 cards and then replaces it. After shuffling the pack, he again draws a card. This he repeats a number of times. The probability that he will draw a heart for the first time in the third draw is

(a)  (b)  (c)  (d) none of these

Q 33. A fair coin is tossed repeatedly. The probability of getting a result in the fifth toss different from

those obtained in the first four tosses is

(a)  (b)  (c)  (d) 

Q 34. If the integers m and n are chosen at random between 1 and 100 then the

(a)  (b)  (c)  (d) 

Q 35. It has been found that if A and B play a game 12 times, A wins 6 times, B wins 4 times and they draw twice. A and B take part in a series of 3 games. The probability that they will win alternately is

(a)  (b)  (c)  (d) none of these

Q 36. If the probability of A to fail in an examination is and that of B is then the probability that either A or B fails is

(a)  (b)  (c)  (d) none of these

Q 37. A and B are two events where P(A) = 0.25 and P(B) = 0.5. The probability of both happening together is 0.14. The probability of both A and B not happening is

(a) 0.39 (b) 0.25 (c) 0.11 (d) none of these

Q 38. Three faces of an ordinary dice are yellow, two faces are red and one face is blue. The dice is tossed 3 times. The probability that yellow, red and blue faces appear in the first, second and third tosses respectively is

(a)  (b)  (c)  (d) none of these

Q 39. India play two matches each with West Indies and Australia. In any match the probabilities of India getting 0,1 and 2 points are 0.45,0.05 and 0.50 respectively. Assuming that the outcomes are independent, the probability of India getting at least 7 points is

(a) 0.0875 (b)  (c) 0.1125 (d) none of these

Q 40. Let A and B be two independent events such that P(A) . Then is equal to

(a)  (b)  (c)  (d) none of these

Q 41. Let A and B be two independent events such that their probabilities ere . The probability of exactly one of the events happening-is

(a)  (b)  (c)  (d)

Q 42. The probability that at least one of the events A and B occurs is . If A and B occur simultaneously with probability  then P(A') + P(B') is

(a)  (b)  (c)  (d) 

Q 43. A, B, C are three events for which P(A) = 0.6, P(B) = 0.4, P(C) = 0.5,

P(A ∪ B) = 0.8, P(A ∩ C) = 0.3 and P(A ∪ B ∩ C) = 0.2.

If P(A ∪ B ∪ C) ≥ 0.85 then the interval of values of P(B ∩ C) is

(a) [0.2,0.35] (b) [0.55,0.7] (c) [0.2,0.55] (d) none of these

Q 44. A coin is tossed 2n times. The chance that the number of times one gets head is not equal to the number of times one gets tail is

(a)  (b)  (c)  (d) none of these

Q 45. A coin is tossed n times. The probability of getting at least one head is greater than that of getting at least two tails by .Then n is

(a) 5 (b) 10 (c) 15 (d) none of these

Q 46. A coin is tossed 7 times. Each time a man calls head. The probability that he wins the toss on more occasions is

(a)  (b)  (c)  (d) none of these

Q 47. A bag contains 14 balls of two colours, the number of balls of each colour being the same. 7 balls are drawn at random one by one. The ball in hand is returned to the bag before each new draw. If the probability that at least 3 balls of each colour are drawn is p then

(a)  (b)  (c) p < 1 (d) 

Q 48. From a box containing 20 tickets ofvalue 1 to 20, four tickets are drawn one by one. After each draw**,** the ticket is replaced. The probability that the largest value of tickets drawn is 15 is

(a)  (b)  (c)  (d) none of these

Q 49. A dice is thrown 2n + 1 times, n 6 N. The probability that faces with even numbers show odd number of times is

(a)  (b) less than  (c) greater than  (d) none of these

Q 50. 6 ordinary dice are rolled. The probability that at least half of them will show at least 3 is

(a)  (b)  (c)  (d) none of these

Q 51. An ordinary dice is rolled a certain number of times. The probability of getting an odd number 2 times is equal to the probability of getting an even number 3 times. Then the probability of getting an odd number an odd number of times is

(a)  (b)  (c)  (d) none of these

Q 52. A card is drawn from a pack. The card is replaced and the pack is reshuffled. If this is done six times, the probability that 2 hearts, 2 diamonds and 2 black cards are drawn is

(a)  (b)  (c)  (d) none of these

Q 53. A man firing at a distant target has 10% chance of hitting the target in one shot. The number of times he must fire at the target to have about 50% chance of hitting the target is

(a) 11 (b) 9 (c) 7 (d) 5

Q 54. There are four machines and it is known that exactly two of them are faulty. They are tested one by one in a random order till both the faulty machines are identified. Then the probability that only two tests will be required is

(a)  (b) 9 (c)  (d) 

Q 55. Let A = {2,3,4,..., 20,21}. A number is chosen at random from the set A and it is found to be a prime number. The probability that it is more than 10 is

(a)  (b)  (c)  (d) none of these

Q 56. All the spades are taken out from a pack of cards. From these cards, cards are drawn one by one without replacement till the ace of spades comes. The probability that the ace comes in the 4th draw is

(a)  (b)  (c)  (d) none of these

Q 57. A point is selected at random from the interior of a circle. The probability that the point is closer to the centre than the boundary of the circle is

(a)  (b)  (c)  (d) none of these

Q 58. A, B and C are contesting the election for the post of secretary of a club which does not allow ladies to become members. The probabilities of A, B and C winning the election are respectively. The probabilities of introducing the clause of admitting lady members to the club by A, B, and C are 0.6, 07 and 0.5 respectively. The probability that ladies will be taken as members in the club after the election is

(a)  (b)  (c)  (d) none of these

Q 59. There are 4 white and 3 black balls in a box. In another box there are 3 white and 4 black balls. An unbiased dice is rolled. If it shows a number less than or equal to 3 then a ball is drawn from the first box but if it shows a number more than 3 then a ball is drawn from the second box. If the ball drawn is black then the probability that the ball was drawn from the first box is

(a)  (b)  (c)  (d) 

**Type 2**

**Choose the correct options. One or more options may be correct.**

Q 60. The probabilities that a student passes in mathematics, physics and chemistry are m, p and c respectively. Of these subjects, a student has a 75% chance of passing in at least one, a 50% chance of passing in at least two, and a 40% chance of passing in exactly two subjects. Which of the following relations are true?

(a)  (b)  (c)  (d) 

Q 61. If E and Fare two events with P(E) ≤ P(F) > 0 then

(a) occurrence of E ⇒ occurrence of F

(b) occurrence of F ⇒ occurrence of E

(c) nonoccurrence of E ⇒ nonoccurrence of F

(d) none of the above implications hold

Q 62. If A and B are two events such that P(A ∪ B) > and ≤ P(A ∩ B)≤  then

(a) P(A) + P(B) ≤  (b) P(A). P(B) <  (c) P(A) + P(B) ≥  (d) none of these

Q 63. If and are the complementary events of the events E and F respectively then

(a) P(E/F) + P(/F) = 1 (b) P(E/F) + P(E/) = 1

(c) P(/F) + P(E/) = 1 (d) P(E/) + P() = 1

Q 64. Given that x e [0,1] and y s [0,1]. Let A be the event of (x, y) satisfying y 2 < x and B be the event of (x, y) satisfying x2 < y. Then

(a) P(A ∩ B) =  (b) A, B are exhaustive

(c) A, B are mutually exclusive (d) A, B are independent

Q 65. Let A and B be two events such that P(A ∩ B) =  P(A ∪ B) = and P() =  .Then

(a) A, B are independent (b) A, B are mutually exclusive

(c) P(A) = P(B) (d) P(B) P(A)

Q 66. The probability that exactly one of the independent events A and B

(a) P(A) + P[B) - 2P(A ∩ B) (b) P(A) + P(B) - P(A ∩ B)

(c) P(A) + P() - 2P(∩) (d) none of these

Q 67. If A and B are independent events such that 0 < P(A) < 1,0 < P(B) < 1 then.

(a) A, B are mutually exclusive (b) A and are independent

(c)  are independent (d) P(A/B) + P(/B) = 1

68. For any two events A and B

(a) P(A ∩ B) ≥ P(A) + P(B) – 1 (b) P(A ∩ B) ≥ P(A) + P(B)

(c) P(A ∩ B) = P(A) + P(B) - P(A ∪ B) (d) P(A ∩ B) = P(A) + P(B) + P(A ∪ B)

69. A coin is tossed repeatedly. A and B call alternately for winning a prize of Rs 30. One who calls correctly first wins theprize. A starts the call. Then the expectation of

(a) A is Rs 10 (b) B is Rs 10 (c) A is Rs 20 (d) B is Rs 20

**Answers**

1c 2a 3b 4c 5c 6c 7c 8b 9c 10d

11a 12d 13d 14a 15b 16c 17a 18b 19d 20c

21c 22b 23a 24d 25a 26c 27c 28a 29b 30a

31a 32a 33d 34a 35b 36c 37a 38a 39a 40a

41a 42c 43a 44c 45a 46c 47a 48b 49d 50a

51c 52c 53c 54b 55c 56a 57c 58a 59d 60b,c

61d 62ac 63ad 64a 65a 66ac 67bcd 68ac 69bc