

BRAIN INTERNATIONAL SCHOOL

SUBJECT : MATHEMATICS

CLASS : XI

DEC 2024

CHAPTER : PROBABILITY

Q1. A card is drawn from a pack of 52 cards.

- (i) How many points are there in the sample space?
- (ii) Calculate the probability that card is an ace of spade.
- (iii) Calculate the probability that the card is
 - (a) an ace
 - (b) a black card

Q2. A die has two faces each with number '1', three faces each with number '2' and one face with number '3'. If die is rolled once, determine.

- (i) $P(2)$
- (ii) $P(1 \text{ or } 3)$
- (iii) $P(\text{not } 3)$

Q3. Two cards are drawn from a well shuffled pack of 52 cards. Find the probability:

- (i) one is black, other is red
- (ii) both are king
- (iii) both are face cards. (Given : Twelve face cards)

Q4. What is the probability that:

- (i) a non-leap year has 53 Tuesday?
- (ii) a leap year has 53 Wednesday?
- (iii) a leap year has 53 Friday and 53 Saturdays?

Q5. A coin is tossed twice, then find the probability of getting at least one head.

Q6. A card is drawn from a well shuffled deck of 52 cards, then find the probability of red king card.

Q7. A bag contains 9 balls of which 4 are red, 3 are blue and 2 are yellow. The balls are similar in shape and size. A ball is drawn at random from the bag. Calculate the probability that it will be:

- (i) red
- (ii) not blue
- (iii) either red or blue

Q8. A die is rolled. Let 'E' be the event "die shows prime number" and 'F' be the event "die shows even number". Are E and F mutually exclusive?

Q9. In a single throw of two dice, what is the probability of getting a total of 8 on the faces of the dice?

Q10. In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both. If one student is selected at random, find the probability that

- (i) the student opted for NCC or NSS
- (ii) the student has opted neither NCC nor NSS.

Q11. Four cards are drawn from a pack of 52 cards. What is the probability of getting 3 diamonds and one spade? Also, find the probability that two cards are red and two are black.

Q12. What is the probability that a letter chosen at random from word 'EQUATIONS' is a consonant?

Q13. A card is drawn from the pack of 52 cards. What is the probability that it is a king or queen?

Q14. Two students Anil and Ashima appeared in an examination. The probability that Anil will qualify the examination is 0.05 and that Ashima will qualify the examination is 0.10. The probability that at-least one of them qualify the examination is 0.13. Find the probability that only one of them will qualify the examination.

Q15. Two students Anil and Ashima appeared in an examination. The probability that Anil will qualify the examination is 0.05 and that Ashima will qualify the examination is 0.10. The probability that both will qualify the examination is 0.02. Find the probability that

- (i) Both Anil and Ashima will not qualify the examination
- (ii) At least one of them will not qualify the examination
- (iii) Only one of them will qualify the examination.

Q16. Find the probability that when a hand of 7 cards is drawn from a well shuffled deck of 52 cards, it contains:

- (i) all kings
- (ii) 3 kings
- (iii) at least 3 kings

Q17. One card is drawn from a well shuffled deck of 52 cards. Calculate the probability that the card drawn will not be an ace.

Q18. A committee of two persons is selected from two men and two women. What is the probability that the committee will have :

- (i) no man?
- (ii) One man?

Q19. 4 cards are drawn from a well-shuffled deck of 52 cards. What is the probability of obtaining 1 diamond and 3 spades?

Q20. If E and F are events such that $P(E) = \frac{1}{4}$, $P(F) = \frac{1}{2}$ and $P(E \text{ and } F) = \frac{1}{8}$, find $P(E \text{ or } F)$.

Q21. A bag contains 5 green and 7 red balls. Two balls are drawn at random. What is the probability that one is green and the other is red?

Q22. A coin is tossed. If head turn up, a die is thrown but if tail comes up, the coin is tossed again. Find the probability of getting

- (i) two tails
- (ii) head and an odd number.

Q23. If a two digit number is formed with the digits 2, 3, 5, 8, 9 without repetition of digits, what is the probability that the digits used are 3 and 5?

Q24. 6 boys and 6 girls sit in a row, find the probability that all the six girls sit together.

Q25. A bag contains 5 red, 4 green and 3 yellow balls. Three balls are drawn out of it at random, find the probability of drawing exactly 2 red balls.

Q26.(i) How many two-digit positive integers are multiples of 3?

- (iii) What is the probability that a randomly chosen two-digit positive integer is a multiple of 3?

Q27. An experiment has four possible outcomes A, B, C and D, that are mutually exclusive. Explain why the following assignments of probabilities are not permissible:

(i) $P(A) = 0.12, P(B) = 0.63, P(C) = 0.45, P(D) = -0.20$

(ii) $P(A) = \frac{9}{120}, P(B) = \frac{45}{120}, P(C) = \frac{27}{120}, P(D) = \frac{46}{120}$

Q28. Determine the probability p, for each of the following events.

- (i) An odd number appears in a single toss of a fair die.
- (ii) At least one head appears in two tosses of a fair coin.
- (iii) A king, 9 of hearts, or 3 of spades appears in drawing a single card from a well shuffled ordinary deck of 52 cards.
- (iv) The sum of 6 appears in a single toss of a pair of fair dice.

Q29. A bag contains 8 red and 5 white balls. Three balls are drawn at random. Find the probability that are drawn at random. Find the probability that:

- (i) All the three balls are white
- (ii) All the three balls are red
- (iii) One ball is red and two balls are white.

Q30. 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?

Q31. A die is loaded in such a way that each odd number is twice as likely to occur as each even number. Find $P(G)$, where G is the event that a number greater than 3 occurs on a single roll of the die.