Statistics Question Bank

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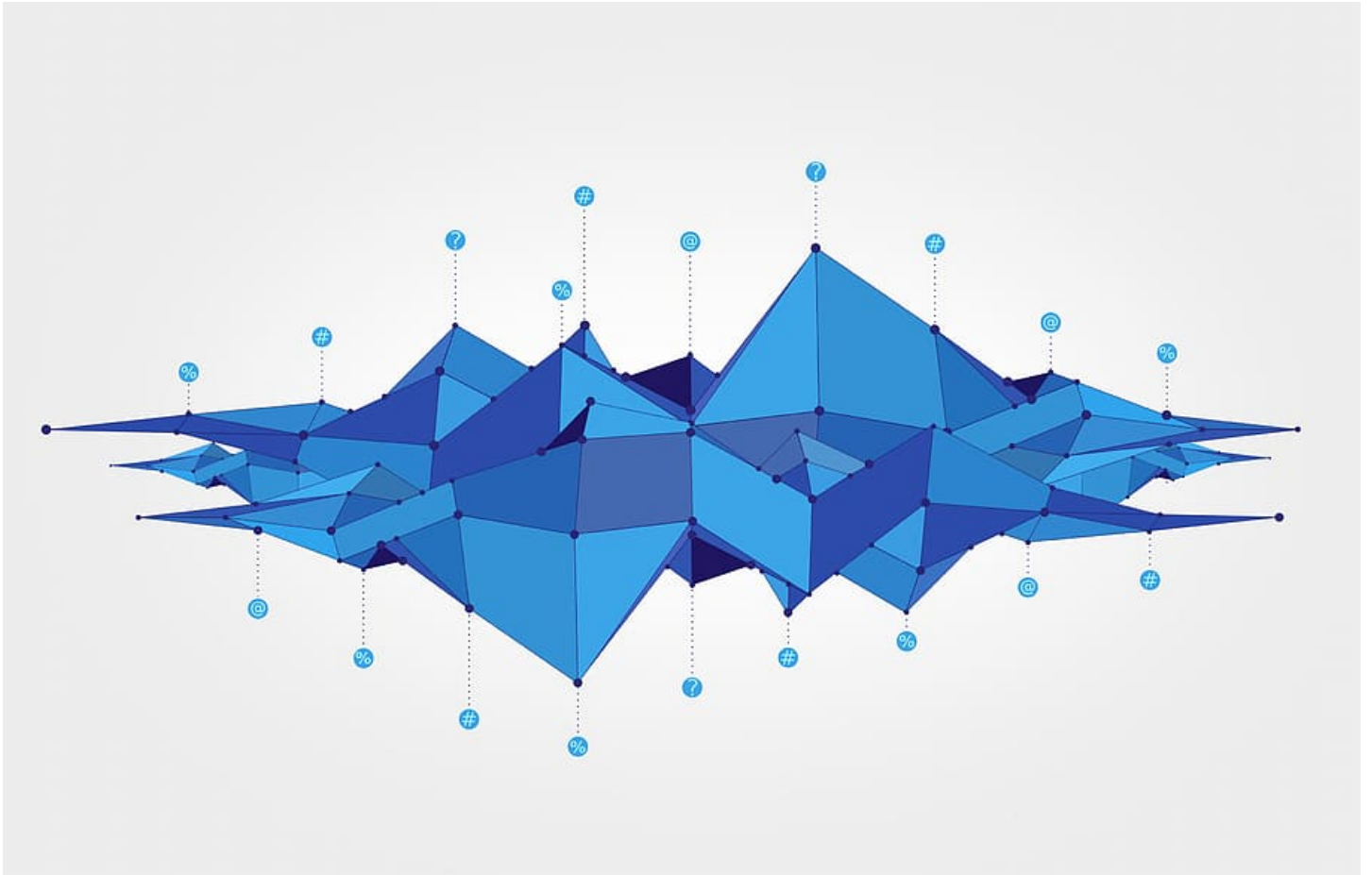
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Contents

Part I
Probability

1 Probability

1.1 Combination

1.1.1 Simple

1. **In how many ways can a team of 2 be formed from 4 people?**
   (a) 4   (b) 6   (c) 8   (d) 12

2. $^nC_r =$
   (a) $\dfrac{n!}{(n-1)!(n+r)!}$ (b) $\dfrac{r!}{n!(n-r)!}$ (c) $\dfrac{n!(n-1)!}{r!}$ (d) $\dfrac{n!}{(r-n)!}$

1.2 Conceptual

1.2.1 Multiple Completion

3. **Possible value of probability**
   i. -1   ii. 0.5   iii. 0
   Which one is correct?
   (a) i and ii   (b) i and iii   (c) ii and iii   (d) i, ii and iii

1.2.2 Simple

4. **What is the probability that at least one item in a sample space will occurr?**
   (a) 0   (b) 0.5   (c) 1   (d) Undefined

5. **The probability of two disjoint sets happening together is:**
   (a) 0.5   (b) 0   (c) 1   (d) $0 \le x < 1$

6. **How many additive laws of probability are there?**
   (a) 1   (b) 2   (c) 3   (d) 4

7. $P(A \cup B) = P(A) + P(B)$ **implies A & B are** $-$
   (a) Disjoint   (b) Independent   (c) Joint   (d) Independent

8. $P(A \cap B) = P(A) \times P(B)$ **implies A & B are** $-$
   (a) Disjoint   (b) Independent   (c) Joint   (d) Independent

9. **Which is the formula of classical approach of probability?**
   (a) $P = \frac{\text{No. of favorable outcomes}}{\text{Total no. of possible outcomes}}$ (b) $P = \frac{\text{No. of total outcomes}}{\text{No. of favorable outcomes}}$
   (c) $P = \lim_{n(S) \to \infty} \frac{n(A)}{n(S)}$ (d) $P = \lim_{n(A) \to \infty} \frac{n(A)}{n(S)}$

10. **Which is the formula of empirical/relative frequency approach of probability?**
    (a) $P = \frac{\text{No. of favorable outcomes}}{\text{Total no. of possible outcomes}}$ (b) $P = \frac{\text{No. of total outcomes}}{\text{No. of favorable outcomes}}$
    (c) $P = \lim_{n(S) \to \infty} \dfrac{n(A)}{n(S)}$ (d) $P = \lim_{n(A) \to \infty} \dfrac{n(A)}{n(S)}$

11. **What is the correct formula for conditional probability?**

    (a) $P(A|B) = \frac{P(A \cap B)}{P(B|A)}$ (b) $P(A|B) = \frac{P(A \cap B)}{P(A)}$ (c) $P(A|B) = \frac{P(A \cap B)}{P(B)}$ (d) $P(A|B) = \frac{P(B|A)}{P(B|A)}$

12. **The third axiom of probability is –**

    (a) $0 \leq P(A) \leq 1$ (b) $P(S) = 1$

    (c) $P(A_1 U A_2 U \cdots U A_n) = \sum_{i=1}^{\infty} P(A_i)$ (d) $P(A) = 1 - P(A)$

13. **An act repeated under some specific conditions is called –**

    (a) Event   (b) Experiment   (c) Sample   (d) Sample space

14. $P(0)$ **implies –**

    (a) A certain event   (b) An uncertain event (c) An impossible event (d) A probable event

15. **Events having some common elements are called –**

    (a) Complementary events   (b) Mutually exclusive events

    (c) Exhaustive events   (d) Non-Mutually exclusive events events

16. **The minimum value of probability is**

    (a) $-\alpha$ (b) 1   (c) 0   (d) -1

17. **Each element of sample space is called–**

    (a) Trial   (b) Experiment   (c) Variable   (d) Sample Point

18. **Two events not ocurring together are called–**

    (a) dependent Events   (b) Independent Events

    (c) Mutually Exclusive Events   (d) Marginal Events

19. **If A and B are independent, which formula is correct?**

    (a) $P(A \cap B) = P(A) \cdot P(B)$ (b) $P(A \cap B) = P(\bar{A}) \cdot P(B)$

    (c) $P(A \cap B) = P(A) \cdot P(\bar{B})$ (d) $P(A \cap \bar{B}) = P(A) \cdot P(B)$

20. **Which of the following are disjoint events?**

    (a) $A = \{1, 2, 3\}, B = \{4, 5\}$ (b) $A = \{a, b\}, B = \{b, c\}$

    (c) $A = \{0\}, B = \{0, 1\}$ (d) $A = \{x, y\}, B = \{x, y\}$

21. **Which of the following are disjoint events?**

    (a) $P = \{1, 2\}, Q = \{2, 3\}$ (b) $P = \{x\}, Q = \{x, y\}$

    (c) $P = \{1, 3\}, Q = \{3, 5\}$ (d) $P = \{m, n\}, Q = \{p, q\}$

22. **Let the sample space be** $S = \{1, 2, 3, \ldots, 10\}$. **Which of the following pairs of events are disjoint?**

    i. A: Number is prime, B: Number is greater than 3
    ii. A: Number is even, B: Number is divisible by 3
    iii. A: Number is less than 5, B: Number is greater than 6

    Which one is correct?

    (a) i and ii   (b) i and iii   (c) ii and iii   (d) i, ii and iii

1.3 Permutation

1.3.1 Simple

23. **Three objects can be placed in 2 positions in − ways.**
    (a) 3   (b) 4   (c) 6   (d) 8

24. $^{n}p_{r} =$
    (a) $\dfrac{n!}{(n-r)!}$ (b) $\dfrac{n!}{(n+r)!}$ (c) $\dfrac{n!}{r!}$ (d) $\dfrac{n!}{(r-n)!}$

Answer Key

1. (b) 6

2. (a) $\dfrac{n!}{(n-1)!(n+r)!}$

3. (c) ii and iii

4. (c) 1

5. (b) 0

6. (b) 2

7. (a) Disjoint

8. (b) Independent

9. (a) $P = \dfrac{\text{No. of favorable outcomes}}{\text{Total no. of possible outcomes}}$

10. (a) $P = \dfrac{\text{No. of favorable outcomes}}{\text{Total no. of possible outcomes}}$

11. (a) $P(A|B) = \dfrac{P(A \cap B)}{P(B|A)}$

12. (c) $P(A_1 U A_2 U \cdots U A_n) = \displaystyle\sum_{i=1}^{\infty} P(A_i)$

13. (b) Experiment

14. (c) An impossible event

15. (a) Complementary events

16. (c) 0

17. (d) Sample Point

18. (c) Mutually Exclusive Events

19. (a) $P(A \cap B) = P(A) \cdot P(B)$

20. (a) $A = \{1, 2, 3\}, B = \{4, 5\}$

21. (d) $P = \{m, n\}, Q = \{p, q\}$

22. (c) ii and iii

23. (c) 6

24. (a) $\dfrac{n!}{(n-r)!}$