Statistics Question Bank

Contents

Part I
Probability

1 Probability

1.1 Permutation

1.1.1 Single

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

1.2 Combination

1.2.1 Single

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

1.3 Permutation

1.3.1 Single

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

1.4 Combination

1.4.1 Single

4. ${}^{n}C_{r} =$
   (a) $\frac{n!}{(n-1)!(n+r)!}$ (b) $\frac{r!}{n!(n-r)!}$ (c) $\frac{n!(n-1)!}{r!}$ (d) $\frac{n!}{(r-n)!}$

1.5 Conceptual

1.5.1 Single

5. **What is the probability that at least one item in a sample space will occurr?**
   (a) 0 (b) 0.5 (c) 1 (d) Undefined
6. **The probability of two disjoint sets happening together is:**
   (a) 0.5 (b) 0 (c) 1 (d) $0 \leq x < 1$
7. **How many additive laws of probability are there?**
   (a) 1 (b) 2 (c) 3 (d) 4
8. $P(A \cup B) = P(A) + P(B)$ **implies A & B are –**
   (a) Disjoint (b) Independent (c) Joint (d) Independent
9. $P(A \cap B) = P(A) \times P(B)$ **implies A & B are –**
   (a) Disjoint (b) Independent (c) Joint (d) Independent
10. **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) $P = \lim_{n(A)\to\infty} \frac{n(A)}{n(S)}$

11. **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) $P = \lim_{n(S)\to\infty} \frac{n(A)}{n(S)}$ (d) $P = \lim_{n(A)\to\infty} \frac{n(A)}{n(S)}$

12. **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) $P(A|B) = \frac{P(B|A)}{P(B|A)}$

13. **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) $P(A) = 1 - P(A)$

1.5.2 Multiple Completion

14. **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

1.5.3 Single

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

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

16. $P(0)$ **implies –**

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

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

(a) Complementary events (b) Mutually exclusive events

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

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

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

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

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

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

(a) dependent Events (b) Independent Events

(c) Mutually Exclusive Events (d) Marginal Events

21. **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) $P(A \cap \bar{B}) = P(A) \cdot P(B)$

22. **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) $A = \{x, y\}, B = \{x, y\}$

23. **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) $P = \{m, n\}, Q = \{p, q\}$

24. **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

“The only thing that’s certain is uncertainty.” — John Allen Paulos
— Abdullah Al Mahmud —

Answer Key

1. (c) 6
2. (b) 6
3. (a) $\frac{n!}{(n-r)!}$
4. (a) $\frac{n!}{(n-1)!(n+r)!}$
5. (c) 1
6. (b) 0
7. (b) 2
8. (a) Disjoint
9. (b) Independent
10. (a) $P = \frac{\text{No. of favorable outcomes}}{\text{Total no. of possible outcomes}}$
11. (a) $P = \frac{\text{No. of favorable outcomes}}{\text{Total no. of possible outcomes}}$
12. (a) $P(A|B) = \frac{P(A \cap B)}{P(B|A)}$
13. (c) $P(A_1 U A_2 U \cdots U A_n) = \sum_{i=1}^{\infty} P(A_i)$
14. (c) ii and iii
15. (b) Experiment
16. (c) An impossible event
17. (a) Complementary events
18. (c) 0
19. (d) Sample Point
20. (c) Mutually Exclusive Events
21. (a) $P(A \cap B) = P(A) \cdot P(B)$
22. (a) $A = \{1, 2, 3\}, B = \{4, 5\}$
23. (d) $P = \{m, n\}, Q = \{p, q\}$
24. (c) ii and iii