Pabna Cadet College

Test Examination - 2021

Class: XII

Subject: Statistics 2nd Paper (MCQ)

Time: 25 minutes **Sub Code: 130** **Full Marks: 25**

Answer all the questions. Each question is worth one (1) mark.

1. Mutually exclusive events are
   (a) always independent
   (b) always dependent
   (c) the relationship cannot be determined
   (d) dependent or independent, depending on scenario

2. $P(A \cup B) = P(A) + P(B)$ is true for
   (a) independent events (b) dependent events
   (c) mutually exclusive events (d) complementary events

3. If a coin is tossed n times, how many outcomes are generated?
   (a) n (b) n^2 (c) 2^n (d) $2n$

   Answer the questions 4-5 according to the information below

   $P(A) = \frac{1}{8}, P(A|B) = \frac{1}{4}$, and $P(B|A) = \frac{1}{6}$

4. $P(A \cap B) =?$
   (a) $\frac{1}{48}$ (b) $\frac{1}{24}$ (c) $\frac{1}{32}$ (d) 1

5. A card is drawn at random from a well-shuffled deck of 52 cards. What is the probability that the drawn card is not a Queen?
   (a) $\frac{1}{52}$ (b) $\frac{4}{52}$ (c) $\frac{1}{13}$ (d) $\frac{12}{13}$

6. If X denotes number of successes in a coin toss, how many possible possible values of X are there?
   (a) 0 (b) 1 (c) 2 (d) 3

7. Which one is a correct condition of a pdf?
   (a) $\int_0^1 f(x)dx = 1$ (b) $P(X) \geq 0$
   (c) $\int_a^b f(x)dx = 1; a \leq x \leq b$ (d) $\int_0^{Median} f(x)dx = 0.55$

8. $P(A \cap \bar{B}) =?$
   (a) $P(A) - P(A \cap B)$ (b) $P(B) - P(A \cap B)$ (c) $P(A) - P(A \cup B)$ (d) $P(B) - P(A \cup B)$

   Answer the questions 9-10 according to the following information.

   $P(x, y) = \frac{x+2y}{16}$

9. $P(X) =?$
   (a) $\frac{x+2y}{3}$ (b) $\frac{2x+y}{3}$ (c) $\frac{2x+3y}{3}$ (d) $\frac{x+3}{4}$

10. $P(X|Y = 0) =?$
    (a) $\frac{x+2y}{4y+1}$ (b) 1 (c) x (d) 0

11. $P(x) = \frac{1}{n}$ and $x = 1, 2, 3, \cdots ; E(X) =?$
    (a) $\frac{n}{2}$ (b) $\frac{n-1}{2}$ (c) $\frac{n+1}{2}$ (d) $n + 1$
12. If $Y = aX + b, E(X) =?$
    (a) $aE(X) + b$ (b) $a^2E(X)$ (c) $E(X)$ (d) $a + bE(X)$
13. Expectation is equal to-
    (a) Variance (b) Square of variance (c) Arithmetic mean (d) Standard deviation
14. If $E(X) = 2$ and $E(X^2) = 8$, what is the standard deviation?
    (a) 0 (b) 2 (c) 4 (d) 8
15. $f(x) = 5x^4; 0 \leq x \leq 1, E(X) =?$
    (a) 0.0204 (b) 0.833 (c) 0.9204 (d) 1
16. The mean of the binomial distribution is
    (a) np (b) nq (c) npq (d) $\sqrt{npq}$
17. What is true of binomial distribution?
    (a) $np = 0$ (b) $np < 0$ (c) $np > 0$ (d) $np \neq 0$
18. If a coin is tossed once, it is called

    i Bernoulli trial
    ii Uniform trial
    iii Poisson process

    Which one is correct
    (a) i & ii (b) i & iii (c) i (d) i, ii, & iii
19. If the mean of a Poisson distribution is 4, what is its variance?
    (a) 2 (b) 3 (c) 4 (d) 16
20. If a Poisson distribution is defined as $P(x) = \frac{e^{-4}4^x}{x!}$, what is the value of $P(X \leq 1)$
    (a) 0.09 (b) 0.02 (c) 0.07 (d) 0.24
21. What is true of Poisson distribution?
    (a) $Mean > Variance$ (b) $Mean < Variance$ (c) $Mean = Variance^2$ (d) $Mean = Variance$
22. The Poisson distribution -

    i is a discrete distribution
    ii gives a probability mass function
    iii gives a probability density function

    Which one is true?
    (a) i & ii (b) i & iii (c) i, ii, & iii (d) ii & iii
23. If a neutral coin is tossed 5 times, what is the probability that there would be at least 2 heads?
    (a) 0.81 (b) 0.5 (c) 0.31 (d) 0.16
24. When is a Binomial distribution symmetric?
    (a) $p < q$ (b) $p > q$ (c) $p = q^2$ (d) $p = q$
25. Which formula represents the exponential growth?
    (a) $P_n = P_o e^{rn}$ (b) $P_n = P_o(1 + r)^n$ (c) $P_n = P_o ne^r$ (d) $P_o = P_n e^{rn}$

Answer Key: (Correction required for 4 thru last)

1. (b) always dependent
2. (c) mutually exclusive events
3. (c) 2^n
4. (a) $\frac{1}{48}$
5. (a) $\frac{1}{52}$
6. (a) 0
7. (a) $\int_0^1 f(x)dx = 1$
8. (a) $P(A) - P(A \cap B)$
9. (a) $\frac{x+2y}{3}$
10. (a) $\frac{x+2y}{4y+1}$
11. (a) $\frac{n}{2}$
12. (a) $aE(X) + b$
13. (a) Variance
14. (a) 0
15. (a) 0.0204
16. (a) np
17. (a) $np = 0$
18. (a) i & ii
19. (a) 2
20. (a) 0.09
21. (a) $Mean > Variance$
22. (a) i & ii
23. (a) 0.81
24. (a) $p < q$
25. (a) $P_n = P_o e^{rn}$