# 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. $P(A\bar{B}) =?$
   (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) $P_n = P_o e^{rn}$