Time: 20 minutes   Sub Code: 130   **Full Marks: 15**

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) $2n$

4. If $P(A) = \frac{1}{8}, P(A|B) = \frac{1}{4}$, and $P(B|A) = \frac{1}{6}, P(A \cap B) =$?
   (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.
   $P(x, y) = \frac{x+2y}{16}$; x = 0, 1 & y = 0, 1, 2, 3

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. If the mean of a Poisson distribution is 4, what is its variance?
    (a) 2   (b) 3   (c) 4   (d) 16

12. What is true of Poisson distribution?

    (a) $Mean > Variance$ (b) $Mean < Variance$ (c) $Mean = Variance^2$ (d) $Mean = Variance$

13. 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

14. Which formula represents the exponential growth?

    (a) $P_n = P_o e^{rn}$ (b) $P_n = P_o(1 + r)^n$ (c) $P_n = P_o n e^r$ (d) $P_o = P_n e^{rn}$

15. Crude death rate is -

    (a) $\frac{B}{F_{15-49}} \times 1000$ (b) $\frac{B}{P} \times 1000$ (c) $\frac{D}{P} \times 1000$ (d) $\frac{B}{A} \times 1000$