

Sylhet Cadet College
Progress Test Examination - 2022
Class: HSC
Subject: Statistics 2nd Paper (MCQ)
Subject Code: 130

Time: 20 minutes

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) $2n$
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 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.

$$P(x, y) = \frac{x+2y}{16}; x = 0, 1 \text{ \& } y = 0, 1, 2, 3$$

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 $Y = aX + b$, $E(Y) = ?$
 - (a) $aE(X) + b$
 - (b) $a^2E(X)$
 - (c) $E(X)$
 - (d) $a + bE(X)$

12. Expectation is equal to-
 (a) Variance (b) Square of variance (c) Arithmetic mean (d) Standard deviation
13. If $E(X) = 2$ and $E(X^2) = 8$, what is the standard deviation?
 (a) 0 (b) 2 (c) 4 (d) 8
14. $f(x) = 5x^4; 0 \leq x \leq 1, E(X) = ?$
 (a) 0.0204 (b) 0.833 (c) 0.9204 (d) 1
15. The mean of the binomial distribution is
 (a) np (b) nq (c) npq (d) \sqrt{npq}
16. What is true of binomial distribution?
 (a) $np = 0$ (b) $np < 0$ (c) $np > 0$ (d) $np \neq 0$
17. 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
18. If the mean of a Poisson distribution is 4, what is its variance?
 (a) 2 (b) 3 (c) 4 (d) 16
19. 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
20. What is true of Poisson distribution?
 (a) $Mean > Variance$ (b) $Mean < Variance$ (c) $Mean = Variance^2$ (d) $Mean = Variance$
21. 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
22. 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
23. When is a Binomial distribution symmetric?
 (a) $p < q$ (b) $p > q$ (c) $p = q^2$ (d) $p = q$
24. 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) $P_o = P_n e^{rn}$
25. 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) $\frac{B}{A} \times 1000$