Bernoulli

SYLHET CADET COLLEGE
PROGRESS TEST EXAMINATION - 2025
CLASS: XII
MULTIPLE CHOICE QUESTIONS
STATISTICS
SECOND PAPER
[According to the Syllabus of 2025]
TIME – 25 minutes
FULL MARKS – 25

Ques Setter	
Moderator	
VP	

Subject Code: | 1 | 3 | 0 |

Set: | C |

[N.B. – Answer all the questions. Each question carries ONE mark. Block fully, with a black ball- point pen, the circle of the letter that stands for the correct/best answer in the "Answer sheet" for the Multiple Choice Questions Examination.]

Candidates are asked not to leave any mark or spot on the question paper.

1. **If n in $P_n = P_o(1+r)^n$ is split into infinite parts and r adjusted accordingly, what type of growth do we have?**
   (a) Simple growth (b) Arithmetic growth (c) Exponential growth (d) Geometric growth

2. **The dependency ratio of a town is 0.60. If there are 40,000 people aged 15–64, how many individuals are considered dependents?**
   (a) 22,000 (b) 26,500 (c) 24,000 (d) 25,000

3. **E(4x+2Y) = ?**
   (a) E(X) - E(Y) (b) 4E(X) + 2E(Y) (c) 2E(X) + 4E(Y) (d) $E(X) \times E(Y)$

Answer the next THREE questions based on the following information

X	1	2	3
P(x)	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$

4. **What is the value of $E(X)$?**
   (a) 2.00 (b) 2.17 (c) 2.33 (d) 2.50

5. **What is the value of $E(X^2)$?**
   (a) 5.17 (b) 4.83 (c) 5.00 (d) 5.33

6. **What is $V(3X)$?**
   (a) 9.67 (b) 11.33 (c) 12.67 (d) 4.25

7. **If $E(X^2) = 45$ and $V(X) = 21$, what is $E(X)$?**
   (a) $4\sqrt{3}$ (b) $2\sqrt{6}$ (c) $6\sqrt{2}$ (d) $7\sqrt{2}$

8. **What is the Standard Deviation of Binomial Distribution?**
   (a) np (b) npq (c) nq (d) $\sqrt{npq}$

9. **In a binomial distribution with $p = 0.5$ and $P(2) = 0.1093$, what is n?**
   (a) 15 (b) 1 (c) 8 (d) 12

10. **Consider a binomial experiment. Which of the following statements is/are true?**
    i. Each trial results in exactly one of two possible outcomes.
    ii. The expected value is always greater than the variance.
    iii. The probability mass function of a binomial distribution can be computed using the binomial formula.

    Which one is correct?
    (a) i and ii (b) i and iii (c) ii and iii (d) i, ii and iii

Answer the next THREE questions based on the following information

The mean of a Binomila distribution is 40 and standard deviation 6.

11. **What is the value of n?**

(a) 200 (b) 300 (c) 400 (d) 500

12. **What is the value of $1 - q$?**

(a) 0.5 (b) 0.2 (c) 0.3 (d) 0.1

13. **What is the value of $P(X \leq 40)$?**

(a) 0.52 (b) 0.54 (c) 0.45 (d) 0.91

14. **Which one is true of the parameter (m) of Poisson Distribution?**

(a) $m = 0$ (b) $m < 0$ (c) $m > 0$ (d) $m = 1$

15. **For a Poisson variate X, if $P(2) = P(3)$, what is the variance?**

(a) 3 (b) 4 (c) 5 (d) 6

16. **A number is randomly chosen from a list of 10 consecutive positive integers. What is the probability that the number selected is greater than the average (arithmetic mean) of all 10 integers?**

(a) $\frac{1}{3}$ (b) $\frac{3}{4}$ (c) $\frac{4}{10}$ (d) $\frac{1}{2}$

17. **Let $S = \{1, 2, 3, \ldots, 10\}$. Which of the following pairs of events are disjoint?**

(a) A: Multiples of 3, B: Multiples of 5

(b) A: Prime numbers, B: Even numbers greater than 2

(c) A: Numbers less than 4, B: Numbers greater than 6

(d) All of the above

18. **The probability of rain is $\frac{1}{6}$ for any given day next week. What is the probability that it will rain on both Monday and Tuesday?**

(a) $\frac{1}{6}$ (b) $\frac{1}{36}$ (c) $\frac{5}{6}$ (d) $\frac{1}{17}$

19. **If $P(A) = 0.2$, $P(B) = 0.3$, and $P(A \cup B) = 0.4$, what is $P(A \cap B)$?**

(a) 0.9 (b) 0.2 (c) 0.3 (d) 0.1

20. **If two fair coins are tossed together, what is the probability of getting at least one head?**

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{3}{4}$ (d) $\frac{1}{4}$

21. **A die is thrown thrice and the number of times a 6 appears is denoted by X. How many possible values can X take?**

(a) 1 (b) 2 (c) 3 (d) 4

22. **For a continuous random variable X with PDF $f(x) = k(2 - x)$ defined on $0 \leq x \leq 2$:**

i. The value of k is 1.
ii. The cumulative distribution function $F(x) = x - \frac{x^2}{4}$ for $0 \leq x \leq 2$.
iii. $P(1 < X < 2) = \frac{3}{8}$

Which one is correct?

(a) i (b) i and ii (c) ii (d) i, ii and iii

Answer the next three questions based on the following information

X	0	1	2	3
P(X)	$\frac{1}{4}$	m	$\frac{1}{3}$	$\frac{1}{6}$

23. **What is the value of m?**

(a) $\frac{1}{3}$ (b) $\frac{5}{12}$ (c) $\frac{1}{4}$ (d) $\frac{1}{6}$

24. **Find $F(2)$.**

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{5}{6}$ (d) $\frac{2}{3}$

25. **What is $P(X > 1)$?**

(a) $\frac{1}{2}$ (b) $\frac{5}{12}$ (c) $\frac{1}{3}$ (d) $\frac{7}{12}$