SYLHET CADET COLLEGE

FIRST TERM-END EXAMINATION - 2024 | Set | A |
CLASS: XII
MULTIPLE CHOICE QUESTIONS **Subject Code:** | 1 | 3 | 0 |
STATISTICS SECOND PAPER
TIME – 25 minutes
FULL MARKS – 25

[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.]

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

1. **A die is rolled twice. How many possible outcomes are there?**
   (a) 6 (b) 12 (c) 36 (d) 18

   Answer the next TWO questions based on the following information.

   An urn contains 5 red, 7 blue, and 8 green balls.

2. **What is the probability that the ball drawn is red?**
   (a) 0.26 (b) 0.25 (c) 0.2 (d) 0.4

3. **P(The ball drawn is not blue)–**
   (a) $\frac{13}{20}$ (b) 0.5 (c) $\frac{7}{20}$ (d) $\frac{8}{20}$

4. **The conditions for a cumulative distribution function (CDF) are–**
   i. $F(x)$ is non-decreasing.
   ii. $0 \leq F(x) \leq 1$
   iii. $\lim_{x\to\infty} F(x) = 1$

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

5. **Which one is not a discrete random variable?**
   (a) Summation two die throw outcome (b) Weight
   (c) Number of heads in five coin tosses (d) Released version number of a software

6. $f(x) = x^2; 0 < X < 4$**; What is** $F(4)$**?**
   (a) 16 (b) 0 (c) 4 (d) 1

   Answer the next three questions based on the following information

   The probability function of random variable x is given below:
   $$P(x) = \frac{2x+1}{k}; x = 1, 2, 3, 4$$

7. **What is the value of** k**?**
   (a) 18 (b) 25 (c) 12 (d) 24

8. **What is** $E(X)$**?**
   (a) 1.75 (b) 2.92 (c) 3.25 (d) 2.25

9. **What is** $V(X)$**?**
   (a) 1.05 (b) 3.0 (c) 1.5 (d) 1.25

10. **The characteristics of binomial distribution–**
    i. $E(X) > V(X)$
    ii. $E(X) = V(X)$
    iii. $E(X) = np$

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

11. **The parameter of a Poisson Distribution is 5. What is its mean?**
    (a) 2 (b) 5 (c) 2.24 (d) 25

12. **When does Binomial Distribution tend to Poisson Distribution?**
    (a) $n \to \infty, p \to 0$ & np is finite (b) $n \to \infty, p \to 0$ & np is infinite
    (c) $n \to \infty, p \to \infty$ & np is finite (d) $n \to 0, p \to \infty$ & np is infinite

13. **A City has a dependency ratio of 0.52. If its working-age population (15-64) is 50,000, what is the total number of dependents (0-14 and 65+)?**
    (a) 15,600 (b) 20,000 (c) 26,000 (d) 30,000

    Answer the next TWO questions using the following information

    $P(C) = \frac{2}{5}, P(D) = \frac{3}{4} \& P(C \cup D) = \frac{9}{10}$

14. $P(C \cap D) = ?$

(a) $\frac{1}{10}$ (b) $\frac{1}{4}$ (c) $\frac{7}{20}$ (d) $\frac{4}{5}$

15. $P(C \cap \bar{D}) = ?$

(a) $\frac{1}{10}$ (b) $\frac{2}{5}$ (c) $\frac{2}{20}$ (d) $\frac{3}{10}$

16. **What is the minimum value of variance a random variable?**

(a) $-\infty$ (b) 1 (c) 0 (d) -1

17. **If $E(X) = -0.5$, then $E(1 - 2X) =$?**

(a) 0 (b) -1 (c) 2 (d) 1

18. **What is the Standard Deviation of Binomial Distribution?**

(a) np (b) npq (c) nq (d) $\sqrt{npq}$

19. **The population of a city is 500,000, and the number of live births recorded in a year is 8,000. What is the Crude Birth Rate (CBR)?**

(a) 12 per 1,000 (b) 16 per 1,000 (c) 20 per 1,000 (d) 22 per 1,000

20. **In a Binomial distribution, how are mean and variance related?**

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

Answer the next two questions based on the following information

For a Poisson variate X, P(2) = P(5).

21. **What is standard deviation?**

(a) 1.978 (b) 1.998 (c) 1.989 (d) 1.889

22. **What is the value of P(2)?**

(a) 0.25 (b) 0.14 (c) 0.15 (d) 0.02

23. **If $P(2)$ in a Poisson distribution with parameter λ equals 0.2240, what is the parameter λ?**

(a) 2.4551 (b) 1.2515 (c) 1.2115 (d) 2.5112

Answer the following 2 questions based on the information given below.

City	Population (in thousands)	Area (in km^2)
Gamma	1200	400
Delta	800	320

24. **What is the population density of City Delta?**

(a) 2 people/km^2 (b) 4 people/km^2 (c) 2.5 people/km^2 (d) 2.2 people/km^2

25. **Which city is less densely populated?**

(a) Gamma (b) Delta (c) Both are equal (d) Cannot be determined

"It is a capital mistake to theorize before one has data." – Sir Arthur Conan Doyle

Answer Key

1. (c) 36
2. (a) 0.26
3. (a) $\frac{13}{20}$
4. (d) i, ii, and iii
5. (d) Released version number of a software
6. (d) 1
7. (d) 24
8. (b) 2.92
9. (a) 1.05
10. (b) i and iii
11. (b) 5
12. (a) $n \to \infty, p \to 0$ & np is finite
13. (c) 26,000
14. (b) $\frac{1}{4}$
15. (c) $\frac{2}{20}$
16. (c) 0
17. (c) 2
18. (d) $\sqrt{npq}$
19. (b) 16 per 1,000
20. (a) $Mean > Variance$
21. (a) 1.978
22. (c) 0.15
23. (b) 1.2515
24. (b) 4 people/km^2
25. (b) Delta