SYLHET CADET COLLEGE
PROGRESS TEST EXAMINATION - 2023   Set   D
CLASS: XII
MULTIPLE CHOICE QUESTIONS   **Subject Code:**   1   2   9
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 Examination.]
Candidates are asked not to leave any mark or spot on the question paper.

1. $P(A \cup B) = P(A) + P(B)$ **implies A & B are** –

   (a) Disjoint   (b) Independent   (c) Joint   (d) Independent

2. **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

3. **How many additive laws of probability are there?**

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

4. **If A and B are independent, which formula is correct?**

   (a) $P(A \cap B) = P(A) \cdot P(B)$ (b) $P(A \cap B) = P(\bar{A}) \cdot P(B)$

   (c) $P(A \cap B) = P(A) \cdot P(\bar{B})$ (d) $P(A \cap \bar{B}) = P(A) \cdot P(B)$

5. **There are 3 red, 4 black, and 5 white balls in an urn. If two balls are randomly taken, what is the probability that both are red?**

   (a) $\dfrac{1}{66}$ (b) $\dfrac{1}{22}$ (c) $\dfrac{2}{22}$ (d) $\dfrac{3}{11}$

   Answer the next two questions based on the following information

   $$f(x) = kx; 0 < x < 5$$

6. **What is the value of** $P(2 < x < 3)$

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

7. $P(X > 0)$

   (a) 0.99   (b) 0.5   (c) 1   (d) 0

8. **Which is a discrete random variable?**

   (a) Age of students   (b) Amount of Production in a factory

   (c) Height of workers   (d) Page size in word processing softwares

9. **What is** $F(-\infty)$ **for a distribution function** $F(x)$**?**

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

   Answer the next two questions based on the following information

   For two exhaustive evenst A & B, P(A) = 0.7 and P(B) = 0.4

10. $P(A \cap B) =$?

    (a) 0.1   (b) 0.3   (c) 0.6   (d) 1

11. **The events A & B are** –

    i. independent
    ii. dependent
    iii. not mutually exclusive

    Which one is correct?

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

12. **If $P(x) = \dfrac{1}{15}; x = 1, 2, 3, \cdots 15$, what is the value of the expectation?**

    (a) 8.5   (b) 7.5   (c) 7   (d) 8

13. **If $P(x) = \dfrac{3 - |4 - x|}{k}; x = 2, 3, 4, \cdots 6$, what is the value of k?**

    (a) 6   (b) 9   (c) 10   (d) 40

14. **If the variance of X is 3, what is the variance of V(3)?**

    (a) 1   (b) 2   (c) 3   (d) 0

15. **If $V(X) = 5.$, what is $V(X + 5)$?**

    (a) 0   (b) 5   (c) 10   (d) 25

16. **E(X) + E(Y) = ?**

    (a) E(X) - E(Y)   (b) E(X) + E(Y)   (c) 2E(X) - E(Y)   (d) $E(X) \times E(Y)$

17. **What is true of binomial distribution?**

    (a) There is one parameter   (b) Number of trial is fixed

    (c) Mean is greater than variance   (d) Skewness is negative

18. **What is the skewness of binomial distribution?**

    (a) $\dfrac{(q - p)^2}{np}$ (b) $\dfrac{(q - p)^2}{np}$ (c) $\dfrac{(p + 1)^2}{npq}$ (d) $\dfrac{(q + p)^2}{npq}$

19. **When is a binomial distribution positively skewed?**

    (a) p > q   (b) p = q   (c) p < q   (d) p+q < 1

Answer the next two questions based on the following information

$$\text{In a binomial distribution, } P(x = 4) = \frac{1}{2}P(x = 5); n = 10$$

20. **What is the mean?**

    (a) 6.25   (b) 5.15   (c) 8.52   (d) 5.22

21. **$P(x = 2) = $ —**

    (a) 0.0053   (b) 0.0069   (c) 0.0085   (d) 0.94

22. **The no. of parameters in a Poisson distribution is —**

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

23. **On average, 1 in 1000 houses in a city gets a fire-burn in a year.If there are 2000 houses, what is the probability that, in a certain year, exactly 5 house will be burnt?**

    (a) 0.036   (b) 0.040   (c) 0.027   (d) 0.091

Answer the next two questions based on the following information

Year	1	2	3	4
Population	100	110	120	130

24. **Which type of growth is seen here?**

    (a) Arithmetic growth   (b) Geometric growth   (c) Exponential growth   (d) None

25. **What is the rate of increase?**

    (a) 1   (b) 0.1   (c) 10   (d) 1%

Why speculate when you can calculate? - John C. Baez

Answer Key

1. (a) Disjoint

2. (b) i and iii

3. (b) 2

4. (a) $P(A \cap B) = P(A) \cdot P(B)$

5. (b) $\dfrac{1}{22}$

6. (d) $\dfrac{1}{5}$

7. (c) 1

8. (d) Page size in word processing softwares

9. (c) 0

10. (a) 0.1

11. (c) ii and iii

12. (d) 8

13. (b) 9

14. (d) 0

15. (b) 5

16. (b) E(X) + E(Y)

17. (c) Mean is greater than variance

18. (a) $\dfrac{(q-p)^2}{np}$

19. (b) p = q

20. (a) 6.25

21. (b) 0.0069

22. (a) 1

23. (a) 0.036

24. (a) Arithmetic growth

25. (b) 0.1