Sylhet Cadet College

Progress Test Examination - 2023

Class: HSC

Subject: Statistics Second Paper (MCQ) **Set: A**

Time: 25 minutes **Subject Code: 130** **Full Marks: 25**

Answer all the questions. Each question is worth one (1) mark.

1. **An act repeated under some specific conditions is called –**
   (a) Event (b) Experiment (c) Sample (d) Sample space

2. **Events having some common elements are called –**
   (a) Complementary events (b) Mutually exclusive events
   (c) Exhaustive events (d) Non-Mutually exclusive events events

3. **Three objects can be placed in 2 positions in – ways.**
   (a) 3 (b) 4 (c) 6 (d) 8

4. ${}^nC_r =$
   (a) $\frac{n!}{(n-1)!(n+r)!}$ (b) $\frac{r!}{n!(n-r)!}$ (c) $\frac{n!(n-1)!}{r!}$ (d) $\frac{n!}{(r-n)!}$

5. **Each element of sample space is called–**
   (a) Trial (b) Experiment (c) Variable (d) Sample Point

6. **An un contains 10 red and 5 black balls. Two balls are drawn; what is the probability of getting two red balls?**
   (a) $\frac{3}{7}$ (b) $\frac{4}{7}$ (c) $\frac{20}{21}$ (d) $\frac{2}{21}$

7. **The conditions of a probability distribution are–**
   i. $\sum P(X) = 1$
   ii. $\sum P(X) = 0$
   iii. $0 \leq P(X) \leq 1$
   (a) i and ii (b) i and iii (c) ii and iii (d) i, ii and iii

   Answer the next two questions using the following information

x	1	2	3	4	5	6
P(x)	k	2k	3k	4k	5k	6k

8. **What is the value of k?**
   (a) $\frac{7}{21}$ (b) $\frac{5}{21}$ (c) $\frac{1}{21}$ (d) 1

9. **What is the type of variable X?**
   (a) Discrete (b) Discrete random (c) Continuous (d) Continuous random

10. $f(x) = 2x; 0 < X < 3$**; What is F(3)?**
    (a) 3 (b) 0 (c) 1 (d) 0

11. **What is the expected value of of the squared deviation of the value of the random variable from their mean?**
    (a) Arithmetic Mean (b) Expectation (c) Variance (d) Co-variance

12. **What is the minimum value of variance a random variable?**
    (a) $-\infty$ (b) 1 (c) 0 (d) -1

13. **If** $y = ax + b$**, what is the value of** $V(y)$?
    (a) $aV(X)$ (b) $a^2V(X)$ (c) $V(X)$ (d) a^2

14. **If** $P(x) = \frac{1}{n}; x = 1, 2, 3, \cdots, n$**, what is the value of** $E(X)$?
    (a) $\frac{n}{2}$ (b) $\frac{n-1}{2}$ (c) $\frac{n+1}{2}$ (d) $n + 1$

15. **What is the value of** $V(5)$**?**
    (a) 0 (b) 25 (c) 5 (d) 1

16. **Which formula of variance is correct?**
    (a) $V(X+Y) = V(X) + V(Y) - 2Cov(X,Y)$ (b) $V(X+Y) = V(X) + V(Y) + 2Cov(X,Y)$
    (c) $V(X+Y) = V(X) + V(Y) - 2Cov(X,Y)$ (d) $V(X+Y) = V(X) - V(Y) + 2Cov(X,Y)$

17. **If $E(X) = 2, E(X^2) = 8, V(X) =-$**

(a) 0 (b) 2 (c) 4 (d) 8

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

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

19. **How many parameters are there in a binomial distribution?**

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

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

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

Answer the next two questions based on the following information.

X is a binomial variate with expectation 4 and standard deviation $\sqrt{3}$.

21. **What are the values of the parameters (mean and probability)?**

(a) 16, $\frac{1}{4}$ (b) 16, $\frac{3}{4}$ (c) 15, $\frac{1}{4}$ (d) 10, $\frac{1}{4}$

22. **What is $P(X \neq 0)$?**

(a) 0 (b) 0.01 (c) 0.99 (d) 1

23. **Which relationship between mean and variance of Poisson Distribution is correct?**

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

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

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

25. **What is the called the ratio of the dependent population to the earning population?**

(a) Dependency ratio (b) Sex ration (c) Population density (d) Growth rate

Answer Key

1. (b) Experiment
2. (a) Complementary events
3. (c) 6
4. (a) $\frac{n!}{(n-1)!(n+r)!}$
5. (d) Sample Point
6. (a) $\frac{3}{7}$
7. (b) i and iii
8. (c) $\frac{1}{21}$
9. (b) Discrete random
10. (c) 1
11. (c) Variance
12. (c) 0
13. (b) $a^2V(X)$
14. (c) $\frac{n+1}{2}$
15. (a) 0
16. (b) $V(X+Y) = V(X) + V(Y) + 2Cov(X,Y)$
17. (c) 4
18. (b) 9
19. (b) 2
20. (d) $\sqrt{npq}$
21. (a) 16, $\frac{1}{4}$
22. (c) 0.99
23. (c) $Mean = Variance$
24. (c) $m > 0$
25. (a) Dependency ratio