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Name.....

Reg. No.....

THIRD SEMESTER (CBCSS-UG) DEGREE EXAMINATION, NOVEMBER 2023

Statistics

STA 3C 02—PROBABILITY DISTRIBUTIONS AND PARAMETRIC TESTS

(2019–2022 Admissions)

Time : Two Hours

Maximum : 60 Marks

*Use of calculator and statistical table are permitted.***Section A (Short Answer Type Questions)***Each question carries 2 marks.**All questions can be attended.**Overall Ceiling 20 marks.*

1. Define standard normal distribution ?
2. The probability of getting a head when a biased coin is tossed is 0.6. What is the probability of getting three heads when this coin is tossed five time ?
3. If X is a point Bernoulli random variable with parameter p , then the variance of X is
4. If Y is a Poisson random variable with parameter λ , then the probability of $Y = 1$ is
5. What is the additive property of Normal distribution ?
6. What do you mean by a statistical hypothesis ?
7. Write the test statistic for testing the mean of a population has specific value in large sample test when the population SD (1) σ is known (2) σ is unknown.
8. Explain simple hypothesis with an example.
9. What is the standard error for testing the equality of means of two populations based on large samples when the standard deviations are unknown and equal ?
10. Give the statistic under the null hypothesis of testing the difference of means of two normal population for small sample, when σ unknown.
11. What is meant by Sampling ?
12. What is non-sampling error ?

(Ceiling 20 marks)

Turn over

Section B (Short Essays/Paragraph Type Questions)

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 30 marks

13. Explain the binomial random experiment and binomial distribution.
14. Define Normal distribution. Describe its four important properties.
15. Define simple random sampling and explain a good method of drawing such a sample from a given population.
16. If X is binomially distributed with 6 trials and a probability of success equal to at each attempt, what is the probability of (a) exactly 4 successes ; and (b) at least one success ?
17. Given a Normal distribution with mean = 40 and SD = 10. Find the value of X that has (a) 15% of the area to its left ; (b) 20% of the area to its right.
18. Explain the term standard error, level of significance and Rejection region in the context of testing of hypothesis.
19. The mean life of 100 fluorescent light tubes produced by a company is computed to be 1,570 hours with standard deviation of 120 hours. The company claims that the average life of the tubes produced by the company is 1,600 hours. Using the level of significance of 0.05, is the claim acceptable ?

(Ceiling 30 marks)

Part C (Short Essay Type Questions)

Answer any one question.

The question carries 10 marks.

20. Define systematic sampling. How will you select it ? Discuss its relative merits and demerits.
21. Time taken by workers in performing a job by Method I and Method II are given below :

Method I	20	16	26	25	23	
Method II	28	33	42	35	52	34

Does the data show that the variances of time distribution by the two methods do not differ significantly. Given that the time distribution are normal.

(1 × 10 = 10 marks)