Reg. No. : ....

Name : ....

Fifth Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Statistics

Open Course

ST 1551.8 : ESSENTIAL STATISTICS FOR SOCIAL SCIENCES

(2014, 2016-2017 Admission)

Time : 3 Hours

Max. Marks : 80

(Use of Calculator and Statistical table is permitted)

PART – A

Answer **all** questions. **Each** question carries **1** mark.

1. Define primary data
2. What are percentiles?
3. Obtain the median and mode of the following data:

    24, 15, 8, 16, 10, 21, 14, 30, 16,7, 11,15
4. What are ogives?
5. Define Yule's coefficient of association
6. Which is the most commonly used relative measure of dispersion in Statistics? How is it computed?
7. Define normal distribution
8. What is analysis of variance?
9. Define regression
10. Write down the mean and variance of binomial distribution with $n=20$ and $p=0.25$

(**10 × 1 = 10 Marks**)

P.T.O.

PART – B

Answer any **eight** questions. **Each** question carries **2 marks.**

11. Point out the general rules for preparing the questionnaire.

12. What are different types of classification?

13. Point out the significance of diagrams and graphs.

14. How scatter diagram is helpful for studying correlation?

15. Write down the lines of regression in a bivariate distribution.

16. Define the classical approach to probability with an example.

17. Comment on the following statement:

    "The median of a distribution is N/2, the lower quartile is N/4 and upper quartile is 3N/4. where N denote the total frequency"

18. Define Poisson distribution. What is its role in practical situations?

19. Distinguish between simple and composite hypotheses with examples.

20. `Define

    (a) Type I error and

    (b) Type II error in testing of hypotheses

21. State any two advantages of non parametric tests.

22. Define run. What is its use in non parametric inference?

(8 × 2 = 16 Marks)

PART – C

Answer any **six** questions. **Each** question carries **4 marks.**

23. Explain the advantages of sampling method over census.

24. Describe the construction of pie diagram.

25. Explain the desirable properties of a good average.

26. Find the mean and standard deviation of 600, 470, 170, 430 and 300.

27. Explain any two measures of dispersion.

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28. State the important properties of normal distribution.

29. .Distinguish between association of attributes and correlation.

30. The lines of regression in a bivariate distribution are:

    $8X-10Y+66 = 0$ and $40X-18Y-214 = 0$.

    Obtain the mean values and regression coefficients.

31. Compare K-S test and Chi-square test in testing of hypotheses.

(6 × 4 = 24 Marks)

PART – D

Answer any **two** questions. **Each** question carries **15 marks.**

32. (a) Write notes on the importance of Statistics in Social Research.

    (b) Explain any two methods of collecting primary data

    (c) Construct histogram for the following frequency distribution:

Class	0-10	10-20	20-30	30-40	40-50
Frequency	6	10	12	2	5

(5 + 4 + 6 =15 marks)

33. (a) Explain the one sample test for median in non parametric hypotheses.

    (b) The win- loss record of a certain basket ball team for their last 20 consecutive games was as follows:

    WWWLLWLLWWWLLLWWLWWLW

    Find the number of runs.

    (c) A company's trainees are randomly assigned to groups which taught a certain industrial inspection procedures by three different methods and they are tested for inspection performance quality. The following are the scores:

    Method A : 80, 83, 79, 85, 90, 68
    Method B: 82, 84, 60, 72, 86, 67, 91.
    Method C: 93,65,77,78,88

    Use Kruskal-Wallis test to determine whether the three methods are equally effective at 5% level of significance.   **(5 + 2 + 8 = 15 marks)**

34. (a) The normal rate of infection of a certain disease in animal is known to be 0.10. If an experiment with 6 animals injected with a new vaccine, what is the probability that none of the animals caught infection?

(b) The waist measurements of 800 girls are normally distributed with mean 66 cm and standard deviation 5 cm. Find the number of girls with waists

(i) between 65 and 70 cms and

(ii) at least 72 cm,

(c) Eight coins are tossed at a time, 256 times. Find the expected frequencies of getting a head. **(3 + 6 + 6 =15 marks)**

35. (a) Compute the coefficient of correlation by Karl Pearson's method from the following:

$$X: \quad 6 \quad 2 \quad 10 \quad 4 \quad 8$$

$$Y: \quad 9 \quad 11 \quad 5 \quad 8 \quad 7$$

(b) The following results were obtained in a bivariate data:

Mean of X =53, Mean of Y =27.9

Regression coefficient of Y on X = -1.5, Regression coefficient of X on Y = –0.2 Find

(i) Correlation between X and Y

(ii) Most probable value of Y when X = 60

(iii) Estimated value of X when Y = 20 **(8 + 7 =15 marks)**

(2 × 15 = 30 Marks)

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