

Mid-West University
Examinations Management Office
Surkhet, Nepal
Final Examinations -2079

Bachelor level/ B.Sc /6th Semester

Time: 3 hrs

Subject : Statistical Modeling-I (STAT 463)

Full Marks: 100

Pass Marks : 50

Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks.

Group A

1. Attempt all the questions

[7x2=14]

- a. Define population regression function.
- b. What do you mean by independence of attributes?
- c. Define stochastic model.
- d. What is p-value?
- e. State the limit of population correlation coefficient.
- f. What is ultimate class frequency?
- g. What do you mean by coefficient of multiple determination?

Group B

Attempt all questions

[10x3=30]

2. Define standard error of estimate.
3. State the condition for consistency of data. Examine the consistency of the following data, N=1000, (A)=600, (B)=500, (AB)=50
4. Prove that total number of class frequencies with n attributes = 3^n .
5. State the assumptions underlying Karl-Pearson's correlation coefficient.
6. Differentiate between linear and non-linear regression model.
7. What is Q-Q plot? Discuss its importance.
8. Define Yule's coefficient of association.
9. What assumptions are required in linear regression models?
10. Obtain the OLS estimators of the population partial regression coefficients
11. Prove that for the variables X, Y and Z, $r_{xy} + r_{yz} + r_{zx} \geq -3/2$.

Group C

Attempt any EIGHT questions

[8x7=56]

12. Discuss about exponential model and logistic growth model.
13. Define Kendall's -tau. Compute Kendall's tau for the following data and interpret the result.
A: 46 53 48 74 47 78 B: 40 58 71 35 75 81.
14. What is dummy variable in regression model? Write down the concept, specification and application of binary logistic model.
15. Discuss about Cobb-Douglas production function with assumptions and applications.
16. Derive the parameters of multiple linear Regression by ordinary least square method.
17. State and prove Gauss's Markov theorem.
18. Estimate the parameters of simple linear regression model by maximum likelihood estimate (MLE) method.
19. Prove that Karl Pearson's correlation coefficient between two variables x and y is,
$$r = \frac{n\sum XY - \sum X \sum Y}{\sqrt{\sum nX^2 - (\sum X)^2} \sqrt{\sum nY^2 - (\sum Y)^2}}$$
20. Prove that $R_{1.23}^2 = 1 - \frac{R}{R_{11}}$ where the symbols have their usual meaning.

THE END