

C 80918

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Name.....

Reg. No.....

**FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2020**

Mathematics

ME 4C 04—MATHEMATICAL ECONOMICS

Time : Three Hours

Maximum : 80 Marks

Part A

*Answer any twelve questions.
Each question carries 1 weightage.*

1. Define the term regression analysis.
2. Give an example of cross-section data.
3. Write the features of Ratio Scale Variables.
4. Write the general form of a regression model which is linear in variables and linear in Parameters ?
5. Write the least square criterion in two variable regression model.
6. Write the two properties of Co-efficient of determination r^2 .
7. Draw a diagram, showing the correlation pattern when the Co-efficient of Correlation is $r = -1$.
8. Write the properties of the standard normal variate $z = \frac{\hat{\beta}_1 - \beta_1}{\sigma}$.
9. Write the OLS estimator for σ^2 .
10. Define Type I error.
11. Define the term p -value.
12. Log-linear model is also called constant elasticity model—Explain.

(12 × 1 = 12 marks)

Part B

*Answer any six questions.
Each question carries 3 weightage.*

13. Distinguish between statistical and deterministic relationships.
14. Write a short note on Correlation.

Turn over

15. Define an ordinal scale variable.
16. What do we mean by a linear regression model ?
17. Write the numerical properties of OLS estimators.
18. Define the term level of significance and power of the test.
19. Write two properties of student's t -distribution.
20. A sample of 20 observations on X and Y gave the following data $\Sigma X = 186.2$; $\Sigma Y = 21.9$;
 $\Sigma(X - \bar{X})^2 = 215.4$; $\Sigma(Y - \bar{Y})^2 = 215.4$ and $\Sigma(X - \bar{X})(Y - \bar{Y}) = 106.4$. Estimate the regression of Y on X .
21. Write a short note on semilog models.

(6 × 3 = 18 marks)

Part C

*Answer any six questions.
Each question carries 5 marks.*

22. Distinguish between Regression and Correlation.
23. Discuss the three types of data used for empirical analysis.
24. Explain the concept of population regression function.
25. Define the term standard error. Also write expression for the standard errors of OLS estimators \hat{B}_1 and \hat{B}_2 .
26. Explain the concept of the Co-efficient of determination r^2 , using Venn diagram.
27. Compute the Co-efficient of Correlation for the following data :

X	:	62	72	78	58	65	70	66	63	60	72
Y	:	50	65	63	50	54	60	61	55	54	65

28. Obtain the rank Correlation Co-efficient for the following data :

X	:	68	64	75	50	64	80	75	40	55	64
Y	:	62	58	68	45	81	60	68	48	50	70

29. Write the steps involved in testing of Hypothesis.
30. Write a note on reciprocal model.

(6 × 5 = 30 marks)

Part D

*Answer any two questions.
Each question carries 10 marks.*

31. Discuss the significance of the stochastic disturbance term u_i .
32. From the following data find the regression equation of y on x :

x	:	2	3	4	5	6
y	:	3	5	4	8	9

33. Following are the observations on two variables X and Y. Estimate the equation $Y = \alpha + \frac{\beta}{X}$.

X	:	2	3	4	5
Y	:	3.1	2.9	2.7	2.6

(2 × 10 = 20 marks)