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D5BEM2202 **Reg. No.....**

Name: .....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024
(Regular/Improvement/Supplementary)
ECONOMICS & MATHEMATICS (DOUBLE MAIN)
GDEC5B07T: ECONOMETRICS I

Time: 2 ½ Hours **Maximum Marks: 80**

SECTION A: Answer the following questions. Each carries *two* marks.
(Ceiling 25 marks)

1. What is the Population Regression Function (PRF)?
2. What do you mean by p-value?
3. Write an account on log-log regression model.
4. Based on a sample size of 500, the following simple regression was estimated by regressing annual vacation days taken (Y) on years of employment with the same company (X):

   $\hat{Y} = 5 + 05\ X$

   Interpret the slope and intercept coefficients.

5. Comment on dummy variable trap.
6. How does multicollinearity affect the interpretation of regression coefficients?
7. What does a Durbin-Watson test value 2 indicate?
8. What is heteroscedasticity in a regression model?
9. What is model specification error?
10. What is a proxy variable?
11. Write a note on the goals of econometrics.
12. Mention the limitations of econometrics.
13. Show that sample regression line passes through $\bar{x}$ and $\bar{y}$.
14. Convert the model $y = ax^{\beta}$ that is linear in parameter.
15. What does a high Variance Inflation Factor (VIF) indicate?

SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 35 marks)

16. Elucidate the concept of omitted variable bias and its impact on regression analysis.
17. Examine the scope of econometrics in the context of modern economic analysis.
18. Describe the significance of the stochastic error term and how it influences the results of a regression model.

(PTO)

19. How does the Gauss-Markov Theorem justify the use of OLS estimators in linear regression?
20. What are the uses of dummy variables?
21. Discuss the difference between R^2 and adjusted R^2. When should adjusted R^2 be used?
22. Explain the concept of heteroscedasticity and its significance in regression analysis.
23. Write a note on piece wise regression.

SECTION C: Answer any *two* questions Each carries *ten* marks.

24. Discuss the implications of model specification errors and measurement errors in regression analysis.
25. Describe the method of maximum likelihood estimation (MLE) and its application in estimating parameters of a two-variable regression model.
26. Consider the following wage-determination equation for the British economy for the period 1950–1969:

$$\widehat{W_t} = 8.582 + 0.364\ PF_t + 0.004\ PF_{t-1} - 2.560\ U_t$$

(1.129) (0.080) (0.072) (0.658)

R^2 =0.873 df=15

Where

W= wages and salaries per employee.

PF = Prices of final output at factor cost.

U= unemployment as a percentage of total number of employees in UK.

t = time.

(the figures in the parentheses are estimated standard errors)

a. Interpret the equation.
b. Are the estimated coefficients individually significant?
c. How can we interpret the value of R^2?
d. Should the variable PF_{t-1} be dropped from the model? Why?

27. Explain auto correlation. What are its sources and detection methods?

(2 × 10 = 20 Marks)