ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU - 27
BCA (DATA ANALYTICS)– III SEMESTER
SEMESTER EXAMINATION: OCTOBER 2022
(Examination conducted in December 2022)
BCADA 3222 – ECONOMETRICS

Time: 2 Hours   **Max Marks: 60**
This paper contains 2 printed pages and 3 parts

PART - A

Answer all questions   **10 x 1 = 10**

1. What is serial correlation?
2. What is the consequence of a simultaneity bias?
3. Give an example (equation) for a non-linear regression model?
4. Does a slope coefficient estimate of -0.82 imply causality?
5. Which technique would you use to apply linear regression on the following model:
$$y = Ax^\beta e^u$$
6. Differentiate between an econometric model and a mathematical model.
7. In a regression equation $Y = \beta_0 + \beta_1 X + \beta_2 D_i + u$, which are the variables?
8. Expand BLUE in the context of OLS estimators.
9. What is a time series?
10. If there are 20 entities and 10 time periods in a panel data set, how many dummy variables have to be incorporated for a fixed effects model?

PART - B

Answer any four questions   **4 x 5 = 20**

11. State Gauss Markov Theorem. Explain the statistical properties of OLS estimators.
12. What is the difference between error term and residual? Use a simple regression framework to give an example.
13. A researcher seeks to understand Sales as a function of advertisement spending and dummy variables for 4 exhaustive regions (North, South, East and West). What specification would imply a dummy variable trap? What is the solution?
14. What are reduced form equations? Bring out the reduced form equations for the following consumption function model.
$C_t = \beta_0 + \beta_1 Y_t + u$
$Y_t = C_t + S_t$
15. What is the difference between an estimator and an estimate? Explain in the context of simple regression model given underlying population regression line $\beta_0 + \beta_1 X_i$.
16. Explain omitted variables bias with an example. How do we avoid omitted variables bias?

Answer any three questions   **3 x 10 = 30**

17. Explain the assumptions of OLS estimation in detail.
18. Panel data includes data for same unit for several periods. Describe the fixed effects methodology using an example.
19. Explain the statistical and numerical properties of OLS estimators in detail.
20. Describe the ARIMA (Box-Jenkins) method for estimating time-series data.