

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: MTECH/PRE-PHD  
BRANCH: RS/QEDS**

**SEMESTER : III/I  
SESSION : MO/2023**

**SUBJECT: ED405 TIME SERIES ECONOMETRICS**

**TIME: 3 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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|--------|---|-----|-----|
| Q.1(a) | Discuss the assumptions of Classical Linear Regression Model.   | [5] | 2 2 |
| Q.1(b) | What is heteroskedasticity? What happens to the OLS estimates in presence of heteroskedasticity?                                      | [5] | 2 3 |
| Q.2(a) | What is the omitted variable bias? Discuss with an example. Which CLRM assumption gets violated in presence of omitted variable bias? | [5] | 1 3 |
| Q.2(b) | How can instrumental variable help in estimation in presence of omitted variable bias. What conditions have to be satisfied?          | [5] | 3 4 |
| Q.3(a) | Suppose you want to estimate $Y_t = X_t\beta + \varepsilon_t$ . Under what assumptions can you get unbiased estimates of $\beta$ ?    | [5] | 5 2 |
| Q.3(b) | Define a white noise process. Is a white noise process stationary? Explain.   | [5] | 5 2 |
| Q.4(a) | What is a trend stationary process? Explain using the case of a time series variable.   | [5] | 5 5 |
| Q.4(b) | Show that you can convert an AR(1) process into a infinite moving average process.  | [5] | 5 4 |
| Q.5(a) | What is the unit root problem in time series. How can you convert a unit root process into a stationary time series?                  | [5] | 5 3 |
| Q.5(b) | Discuss the unit root test.   | [5] | 5 3 |

:::22/11/2023:::E