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

CLASS: IMSc. **SEMESTER : V**
BRANCH: QEDS **SESSION : MO/2023**

SUBJECT: ED305 BASIC 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.

			CO	BL
Q.1(a)	What is the Breusch Pagan test used for? Describe how the Breusch-Pagan test and the White test are different.	[5]	2	2
Q.1(b)	Describe the estimation process of β using the iterative method in $Y_t=X_t\beta+\varepsilon_t$ where $\varepsilon_t=\rho\varepsilon_{t-1}+u_t$ and u_t is White Noise error term	[5]	2	3
Q.2(a)	The violation of which CLRM assumption causes endogeneity problem? Discuss briefly what the three sources of endogeneity problem are.	[5]	1	3
Q.2(b)	Suppose you need to estimate β in $Y=\beta X+\rho W+\varepsilon$ where Y is dependent variable, X is endogenous explanatory variable, W is the vector of control variables and ε is the error term. Suppose Z is an instrumental variable. Show how you can estimate β_{IV} (estimated β using instrumental variable) from the reduced form equation.	[5]	3	4
Q.3(a)	What is a stochastic process? What are the components of a stochastic process?	[5]	5	2
Q.3(b)	What do you understand by detrending a time series? How do you detrend a time series using additive and multiplicative methods respectively?	[5]	5	2
Q.4(a)	Explain why Random Walk without drift is a non-stationary time series. Explain how you can convert a Random Walk without drift into a stationary time series.	[5]	5	5
Q.4(b)	What can you say about the stationarity of a MA(q) process? Explain your answer.	[5]	5	4
Q.5(a)	If your time series has no trend or seasonality, describe the method you will use for forecasting.	[5]	5	3
Q.5(b)	Discuss what happens if the smoothing parameter is close to zero or close to one. What method should one adopt to determine the value of the smoothing parameter?	[5]	5	3

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