Name: Enrolment No:	

UPES

End Semester Examination, December 2024

Course: Introduction to Econometrics **Semester: III**
Program: BBA – Foreign Trade **Time: 03 hrs.**
Course Code: ECON 2037 **Max. Marks: 100**

Instructions:

- **This is a CLOSE BOOK exam.**
- **All questions are mandatory.**
- **The use of laptops, internet access, mobile phones, and other electronic devices is strictly prohibited during the exam**
- **Use of unfair means will result in immediate disciplinary action.**

SECTION A
10Qx2M=20Marks

S. No.		Marks	CO
Q 1	(a) What is econometrics?	**2**	**CO1**
	(b) Data on one/more variables collected at a given point of time is known as: (A) Panel data. (B) Time series data. (C) Pooled data. (D) Cross-section data.	**2**	**CO1**
	(c) What is the difference between experimental data and observational data?	**2**	**CO1**
	(d) What is the difference between *cross-section data* and *panel data*?	**2**	**CO1**
	(e) BLUE is referred as the (A) Best Linear Unbiased Estimator. (B) Best Linear Unconditional Estimator. (C) Basic Linear Unconditional Estimator. (D) Both (A) and (C).	**2**	**CO1**
	(f) When is a Chi-Squared Distribution?	**2**	**CO1**
	(g) "Correlation doesn't imply causation." – TRUE or, FALSE?	**2**	**CO1**
	(h) Type I error occurs when we: (A) reject a false null hypothesis. (B) reject a true null hypothesis. (C) do not reject a false null hypothesis. (D) do not reject a true null hypothesis.	**2**	**CO1**

	(i) The coefficient of determination, R^2 shows: (A) The proportion of the variation in the dependent variable Y is explained by the independent variable X. (B) The proportion of the variation in the dependent variable X is explained by the independent variable Y. (C) The proportion of the variation in ε is explained by the independent variable X. (D) Both (A) and (C).	**2**	**CO1**
	(j) Two events, A and B, are said to be mutually exclusive if: (A) $\mathrm{P(A \mid B)} = 1$ (B) $\mathrm{P(B \mid A)} = 1$ (C) $\mathrm{P(A \,\&\, B)} = 1$ (D) $\mathrm{P(A \,\&\, B)} = 0$	**2**	**CO1**
SECTION B **4Qx5M= 20 Marks**			
Q 2	What is a *Null Hypothesis* (H_0) and an *Alternative Hypothesis* (H_1)? Using a relevant example, briefly explain these two concepts.	**5**	**CO2**
Q 3	Using a relevant example, briefly explain the difference between *Two-Tailed* & *One-Tailed* Tests.	**5**	**CO2**
Q 4	State a few importance of random sampling in econometrics.	**5**	**CO2**
Q 5	Using a relevant example and with reference to the figure, briefly explain what is meant by the *p-value?*	**5**	**CO2**
SECTION-C **3Qx10M=30 Marks**			
Q 6	Using the regression function $\boxed{Y_i = \alpha + \beta X_i + \varepsilon_i}$ write down the **key five assumptions of the Ordinary Least Squares (OLS)** and briefly explain each one of them.	**10**	**CO3**
Q 7	Briefly explain the following concepts: (A) Leptokurtic distribution (B) Covariance (C) Mean squared prediction error (MSPE) (D) i.i.d. random variables (E) The 'central limit theorem'	**10**	**CO3**
Q 8	True or False? Briefly justify the reasoning. "If a fair coin is tossed many times for independent trials, and the last eight tosses are all tails, then the chance that the next toss will be tails is somewhat less than 50%."	**10**	**CO3**

SECTION-D
2Qx15M= 30 Marks

Q 9

In Dehradun, a given population of two-earner male-female couples, the male earnings have a mean of Rs. 50,000 per month & a S.D. of Rs. 15,000. The female earnings have a mean of Rs. 48,000 per month and a S.D. of Rs. 13,000. The correlation between male and female earnings for a couple is 0.90. Let ***C*** denote the **combined** earnings for a randomly selected couple. Answer the following:

(A) What is the mean value of ***C*** ?

(B) What is the correlation between the male and female earnings?

(C) What is the standard deviation (S.D.) of ***C*** ?

(D) Convert the answers to (a) through (c) from Indian Rupees (Rs.) to U.S. Dollars ($), given $1 = Rs. 80, the current exchange rate, *e*.

15 | **CO4**

Q 10

India has seen a significant rise in Foreign Direct Investment (FDI) inflows in the manufacturing sector over the past decade. Policymakers argue that higher FDI inflows lead to better export performance. The following data has been collected on **FDI inflows (in USD billion)** and **export growth (in %)** from 2017 to 2023:

Year	FDI Inflows ($ Billion)	Export Growth (%)
2017	25.32	6.06%
2018	28.01	6.55%
2019	30.02	7.04%
2020	35.30	8.01%
2021	38.02	8.52%
2022	40.04	9.01%
2023	45.08	10.07%

(A) In reference to the data above, provide a simple predictive linear regression model where export growth is the dependent variable and FDI inflows are the independent variable.

(B) Interpret **each of the statistics given in the table below** – results from the regression analysis:

Variable	Coefficient	Standard Error	*t*-statistic	*p*-value
Constant (β_0)	1.20	0.80	1.52	0.170
FDI inflows (β_1)	0.22	0.05	4.41	0.001
R^2	0.89	-	-	-

(C) Estimate the expected export growth if FDI inflow in 2024 increases to $ 50.20 billion.

(D) Based on the R^2 value, how well does the model explain the variation in export growth?

(E) What are some potential **sources of bias** in this model? Discuss at least two (2) types of biases that could affect the accuracy of the results, and also provide feasible solutions to these biases.

(F) Given the potential biases identified in the current model, propose a more robust econometric model that could better explain India's export growth.

15 | **CO4**