Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UPES

End Semester Examination, December 2023

Course: Financial Econometrics

Semester: III

Program: MBA (Finance Management)

Time: 03 hrs.

Course Code: FINC8009

Max. Marks: 100

Instructions: Kindly read all the questions carefully.

SECTION A

10Qx2M=20Marks

S. No.		**Marks**	**CO**
	Statement of question		**CO1**
Q 1.1	The regression coefficients estimated in the presence of multicollinearity in the explanatory variables are NOT a. Unbiased estimators b. Consistent estimators c. Efficient estimators d. Linear estimators	**2**	**CO1**
Q 1.2	Confidence interval of estimators estimated using OLS in the presence of serial correlation in the dataset will be a. Larger than the confidence interval derived from GLS procedure b. Smaller than the confidence interval derived from GLS procedure c. Smaller than the confidence interval derived from GLS procedure d. Can't say anything about the GLS procedure	**2**	**CO1**
Q 1.3	Using OLS estimation in the presence of heteroscedasticity will lead to a. easy acceptance of statistically significant coefficient using t and F test b. easy rejection of statistically significant coefficient using t and F test c. The t and F test still being accurate d. t test gives accurate result while F test does not	**2**	**CO1**
Q 1.4	d-statistics values are limited to a. 0 to 2 b. 2 to 4 c. 0 to 4 d. 4 ± 2	**2**	**CO1**

Q 1.5	A researcher regresses the consumption on income and income^2. Here the issue of perfect collinearity occurs. a. True b. False c. Depends on the functional form d. Depends on the economic theory	**2**	**CO1**
Q 1.6	The value of adjusted R^2 is always less than R^2. This statement is a. Correct b. Incorrect c. Depends on no. of X variables d. Depends on no. of observations (n values)	**2**	**CO1**
Q 1.7	A purely random process is a stationary series with a. Zero variance b. Zero mean c. Positive mean d. Zero mean and zero variance	**2**	**CO1**
Q 1.8	The sample parameter estimator follows a. t – distribution b. normal distribution c. F-distribution d. Chi-square distribution	**2**	**CO1**
Q 1.9	Given the assumptions of CLRM, the OLS estimators possess some optimum properties given under Gauss-Markov theorem. Which of the statement is NOT part of them. a. The estimator $\hat{\beta}_2$ is a linear function of a random variable b. The average values of the estimator $\hat{\beta}_2$ is equal to zero c. The estimator $\hat{\beta}_2$ has minimum variance d. The average values of the estimator $\hat{\beta}_2$ is equal to β_2	**2**	**CO1**
Q 1.10	Under the OLS assumption $E(ui/xi)$ a. Positive values b. Negative values c. Equal to zero d. Any of the above	**2**	**CO1**
SECTION B **4Qx5M= 20 Marks**			
Q	Statement of question		
2	Coefficient of determination	**5**	**CO2**
3	Stationarity	**5**	**CO2**
4	Spatial Autocorrelation	**5**	**CO2**
5	Perfect collinearity	**5**	**CO2**
SECTION-C **3Qx10M=30 Marks**			
Q	Statement of question		

<table>
<tr><td>6</td><td>Write down the statistical properties of Ordinary Least Square (OLS) estimators.</td><td>10</td><td>CO3</td></tr>
<tr><td>7</td><td>Describe some of the plausible reasons for occurrence of autocorrelation in the model.</td><td>10</td><td>CO3</td></tr>
<tr><td>8</td><td>Describe the Unit root test.
Or,
Describe the Durbin-Watson d Test</td><td>10</td><td>CO3</td></tr>
<tr><td colspan="4" align="center">SECTION-D
2Qx15M= 30 Marks</td></tr>
<tr><td>Q</td><td>Statement of question</td><td></td><td></td></tr>
<tr><td>9</td><td>Consider an equation to explain investment decision of people in terms of income (inc, in Rs.), education (edu, in years), and ability (measured by IQ-test score):

Log (investment) = $\beta 0 + \beta_1 \log(inc) + \beta_2$ edu + β_3 ability + u

a. In terms of the model parameters, state the null hypothesis that ability has no effect on investment behavior of individual. State the alternative that better ability invest more in financial market.

After running the above regression model on sample of 500 CEOs by OLS, following equation was obtained:

Log (investment) = 4.32 + .280 log(inc) + .0174 edu + .00024 ability
(0.322) (.0352) (.00412) (.000542)
N= 500, R^2= 0.283.

b. By what percentage is investment predicted to increase if education increases by 5 years and ability by 20 points? Does ability have a practically large effect on investment?
c. Test the null hypothesis that ability has no effect on investment against the alternative that ability has a positive effect. Carry out the test at the 5% significance level.
d. If education and ability are positively correlated, would you include ability in a final model explaining investment behavior in terms of individual ability? Explain in terms trade-off between omission of an important variable from the model and inclusion of it in the model.</td><td>2+3+4+6</td><td>CO4</td></tr>
<tr><td>10</td><td>The following regression are based on GDP (Gross Domestic Product) data for the Indian economy from 1960-2007 (48 years).

$\Delta \widehat{GDP}_t = 0.0334\, GDP_{t-1}$
t = (12.37)
R^2 = 0.07, d = 0.3663, RSS = 206.65</td><td>5+5+5</td><td>CO4</td></tr>
</table>

	$\Delta\widehat{GDP}_t = 1.8662 + 0.0192\, GDP_{t-1}$ t= (3.27) (3.86) $R^2 = 0.249$, d = 0.4462, RSS = 166.921 $\Delta\widehat{GDP}_t = 1.1611 + 0.5344\, t - 0.1077\, GDP_{t-1}$ t = (2.37) (4.80) (- 4.02) $R^2 = 0.507$, d = 0.607, RSS = 109.608 a. What do you understand by stationarity of a series. Briefly describe any test to detect it. b. Examine the preceding regression. What can you tell about the stationarity of the CPI time series? c. How would you choose among the three models?		

TABLE G.2 Critical Values of the *t* Distribution

		Significance Level				
1-Tailed:		.10	.05	.025	.01	.005
2-Tailed:		.20	.10	.05	.02	.01
	1	3.078	6.314	12.706	31.821	63.657
	2	1.886	2.920	4.303	6.965	9.925
	3	1.638	2.353	3.182	4.541	5.841
	4	1.533	2.132	2.776	3.747	4.604
	5	1.476	2.015	2.571	3.365	4.032
	6	1.440	1.943	2.447	3.143	3.707
	7	1.415	1.895	2.365	2.998	3.499
	8	1.397	1.860	2.306	2.896	3.355
	9	1.383	1.833	2.262	2.821	3.250
	10	1.372	1.812	2.228	2.764	3.169
Degrees of Freedom	11	1.363	1.796	2.201	2.718	3.106
	12	1.356	1.782	2.179	2.681	3.055
	13	1.350	1.771	2.160	2.650	3.012
	14	1.345	1.761	2.145	2.624	2.977
	15	1.341	1.753	2.131	2.602	2.947
	16	1.337	1.746	2.120	2.583	2.921
	17	1.333	1.740	2.110	2.567	2.898
	18	1.330	1.734	2.101	2.552	2.878
	19	1.328	1.729	2.093	2.539	2.861
	20	1.325	1.725	2.086	2.528	2.845
	21	1.323	1.721	2.080	2.518	2.831
	22	1.321	1.717	2.074	2.508	2.819
	23	1.319	1.714	2.069	2.500	2.807
	24	1.318	1.711	2.064	2.492	2.797
	25	1.316	1.708	2.060	2.485	2.787
	26	1.315	1.706	2.056	2.479	2.779
	27	1.314	1.703	2.052	2.473	2.771
	28	1.313	1.701	2.048	2.467	2.763
	29	1.311	1.699	2.045	2.462	2.756
	30	1.310	1.697	2.042	2.457	2.750
	40	1.303	1.684	2.021	2.423	2.704
	60	1.296	1.671	2.000	2.390	2.660
	90	1.291	1.662	1.987	2.368	2.632
	120	1.289	1.658	1.980	2.358	2.617
	∞	1.282	1.645	1.960	2.326	2.576

Examples: The 1% critical value for a one-tailed test with 25 *df* is 2.485. The 5% critical value for a two-tailed test with large ($>$ 120) *df* is 1.96.

Source: This table was generated using the Stata® function invttail.