

Mid-West University
Examination Management Office

Chance Examinations-2080

Bachelor level / B. Sc. / 8th Semester

Time: 3 hours

Subject: **Statistical Modeling II (Stat 483)**

Full Marks:100

Pass Marks: 50

Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks

GROUP – A

1. Answer in short. [7x2=14]

- a) Write down assumption of the classical linear regression model in matrix notation.
- b) What are the causes of multicollinearity?
- c) Give the meaning of heteroscedasticity.
- d) Is multicollinearity really a problem?
- e) Why stationary assumption required for the time series analysis?
- f) What do you understand by time series data?
- g) What is PRESS residuals?

GROUP-B

2. Answer in brief. [10x3=30]

- a) What do you understand by coefficient of determination R^2 . Also express it into matrix notation. [1+2]
- b) What are the practical consequence of multicollinearity?
- c) How can you explain variance inflation factor (VIF) for detection of multicollinearity?
- d) Discuss detection of heteroscedasticity using graphical method.
- e) Mention the consequences of heteroscedasticity.
- f) List out different causes of autocorrelation.
- g) Discuss the removal process of autocorrelation.
- h) Write down the feature of stochastic (random) process in time series analysis.
- i) Discuss on moving average (MA) process.
- j) Explain concept of model adequacy checking.

GROUP-C

Descriptive Answer Questions (Attempt any EIGHT questions). [8x7=56]

3. Derive the ordinary least square (OLS) estimate of the regression coefficients in matrix notations. [7]
4. How can you detect of multicollinearity using correlations? Also discuss its remedial measure. [3+4]
5. What are the different methods for detection of heteroscedasticity? Describe the White's test for the detection of heteroscedasticity. [1+6]
6. Describe the removal process of the autocorrelation. [7]
7. What is Durbin-Watson test? Suppose the residual for the set of the data collected over 8 consecutive time period are as follows;

Time period	1	2	3	4	5	6	7	8
Residuals	-2	-3	2	-1	0	1	4	-2

Compute the Durbin-Watson statistics at 0.05 level of significance. Is there any evidence of autocorrelation among residuals? [1+6]

8. Describe the test for lack of fit on a regression model. [7]
9. What do you understand by autoregressive and moving average (ARMA) model? Also discuss it's parameter estimation procedure. [3+4]
10. Describe the test of stationarity using correlogram and unit root test. [3+4]
11. What do you understand by distributed lag models? Discuss Koyck approach to distributed lag model? [2+5]

The End