UNIRAZAK
UNIVERSITI TUN ABDUL RAZAK

FINAL EXAMINATION

NOVEMBER 2023

COURSE TITLE	**INTRODUCTION TO ECONOMETRICS**
COURSE CODE	TECO3233
DATE/DAY	20 FEBRUARY 2024 / TUESDAY
TIME/DURATION	02:00 PM - 04:00 PM / 02 Hour(s) 00 Minute(s)

INSTRUCTIONS TO CANDIDATES :

1. Please read the instruction under each section carefully.
2. Candidates are reminded not to bring into examination hall/room any form of written materials or electronic gadget except for stationery that is permitted by the Invigilator.
3. Students who are caught breaching the Examination Rules and Regulation will be charged with an academic dishonesty and if found guilty of the offence, the maximum penalty is expulsion from the University.

(This Question Paper consists of 3 Printed Pages including front page)

DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

This question paper consists of TWO (2) questions. Answer ALL questions in the answer booklet provided. **[100 MARKS]**

QUESTION 1 (55 Marks)

Ahmad, an economist is interested to estimate the Keynesian consumption function on a sample of 4 individuals. The Keynesian consumption function basically explains that an individual disposable income is a key determinant of his consumption. For this purpose, he collected the following data:

Table 1

| Individual	Annual Consumption ('000)	Annual Disposable Income ('000)
1	45	60
2	50	75
3	30	80
4	60	85

a) Based on data presented in Table 1, use the Ordinary Least Square (OLS) method to compute the estimated intercept and slope coefficient of the consumption regression. (16 marks)

b) Upon estimating the relevant coefficients using the OLS, compute the residual sum of square (RSS). (10 marks)

c) To prove that the Keynesian consumption function is valid, the estimated slope coefficient has to be significantly more than zero. Explain how Ahmad can prove that. (5 marks)

d) Compute the R-squared of the estimated regression. (8 marks)

e) Among the four individuals, which one of them can be considered as an outlier? Explain your answer. (Hint: Outlier refers to any observation(s) whose behavior differ(s) significantly from others) (6 marks)

f) OLS is deemed as "BLUE" to estimate the Keynesian consumption function. Explain what "BLUE" means. (10 marks)

QUESTION 2 (45 marks)

a) The following are mathematical expressions of some of the Classical Linear Normal Regression Model (CLNRM) assumptions. Describe each of them and explain what the implications are on the estimated parameters (in terms of magnitude of variance and biasness) if they are violated.

   i. $Cov(\hat{u}_i, \hat{y}_i) = 0$ (5 marks)
   ii. $Cov(\hat{u}_i, \hat{u}_j) \neq 0$; $\hat{u}_i \neq \hat{u}_j$ (5 marks)
   iii. $Var(\hat{u}_i) = \sigma^2$ (5 marks)
   iv. $u_i \sim N(\mu, \sigma^2)$ (8 marks)

b) Kiki collected a sample of 1000 households to determine how travelling expenditure is affected by monthly income. Upon estimating the relevant regression, he plots the residuals of the regression against the fitted values and observes the following pattern:

Fitted Values vs. Residuals
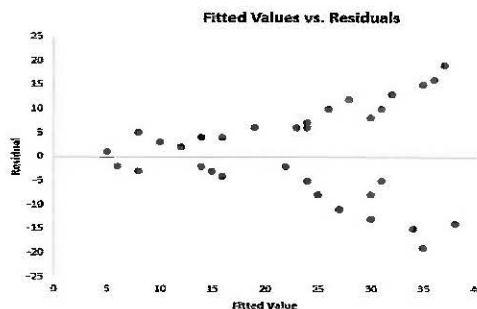
i. Explain which of the Gauss-Markov assumptions that Arif has most likely violated. (7 marks)

ii. Explain THREE (3) causes that can lead to the violation of the assumption as suggested by the answer to question 2(b)(i) above. (15 marks)

*** END OF QUESTION PAPER ***