

ADMISSION NUMBER									

### School of Business

**Master of Business Administration MBA Dual Specialization  
Semester End Examination - May 2024**

**Duration : 180 Minutes  
Max Marks : 100**

#### Sem IV - MBBA6003 - Advance Statistics and Econometrics

General Instructions

*Answer to the specific question asked*

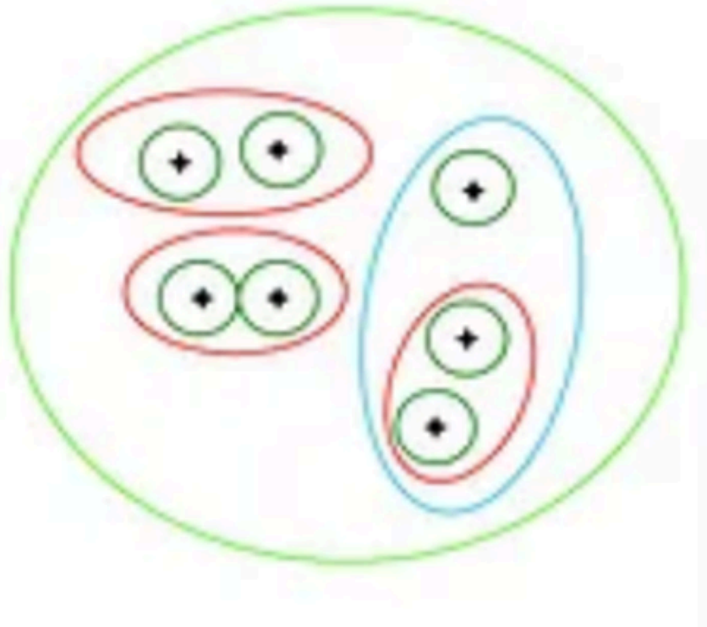
*Draw neat, labelled diagrams wherever necessary*

*Approved data hand books are allowed subject to verification by the Invigilator*

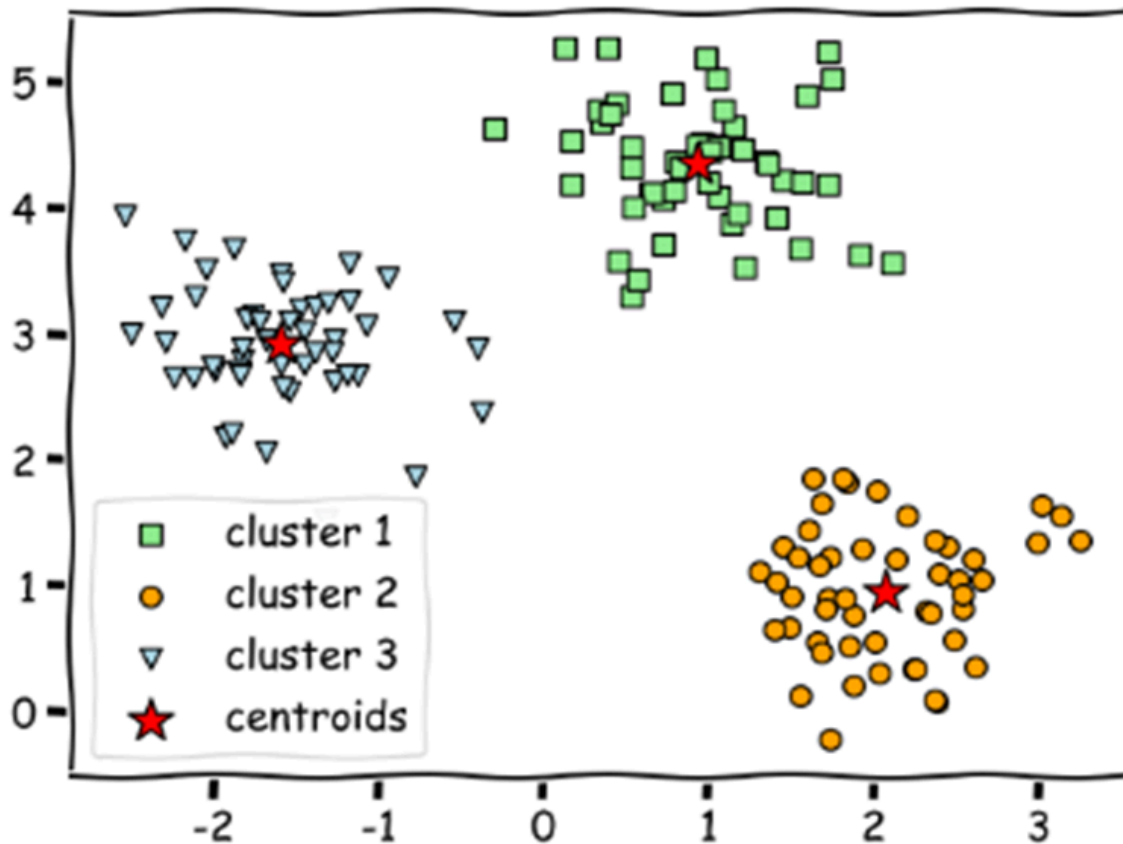
- 1) A manager in a company conducts MANOVA using Gender and Business Travel as fixed factors and Monthly Income and Years with company as dependent variables. The result of Wilk's Test is given in the table. Apply the concept of main and interactions effect to explain the results. K3 (6)

Source	Wilks' Lambda	F-Value	p-value
Gender	0.85	4.21	0.023
Business Travel	0.92	2.86	0.056
Gender*Travel	0.78	6.72	0.005

- 2) Differentiate between hierarchical clustering and density based clustering with suitable examples. K4 (8)



- 3) Differentiate between neighbourhood based clustering and hierarchical clustering with suitable examples. K4 (8)



- 4) Explain the usage of time series analysis for business decisions. K4 (4)
- 5) When do you apply Probit model in multi-variate analysis? Give reasons and steps of its usage. K3 (9)
- 6) Evaluate the role multi-variate analysis in today's business environment. K5 (10)
- 7) How do you evaluate the number of lags needed in a time series model? How do analysts decide on the number of lags for stock trading days? K5 (10)
- 8) A fast-growing technology startup aims to effectively manage its human resources and anticipate future hiring needs to support its expansion plans. The company wants to leverage historical hiring data and external factors to develop a predictive model that forecasts employee growth accurately. Compare the strengths and weaknesses of time series model for this purpose. How do you select which model is best for forecasting employee growth in an organization? K5 (15)

Date	Employee_Count	External_Factors
2021-01-01	50	Funding Round
2021-02-01	55	Industry Events
2021-03-01	60	Economic Growth
2021-04-01	65	Industry Events
2021-05-01	70	Economic Growth

- 9) A healthcare organization is conducting a study to predict patient readmission within 30 days after discharge. They have collected data from a sample of 1000 patients, measuring various demographic, clinical, and administrative variables with objective to develop a predictive model using Linear Discriminant Analysis (LDA) to identify patients who are at high risk of readmission within 30 days after discharge. Formulate hypothesis and a suitable methodology to test them. Suggest what interpretations a business manager can make.

K6 (18)

Snippet of dataset:

Patient ID	Age	Gender	Race	Length of Stay (days)	Chronic Conditions	Insurance Type	Discharge Status	Readmitted within 30 days
1	65	Male	Caucasian	5	Yes	Private	Home	Yes
2	55	Female	African	3	No	Medicaid	Home	No
3	70	Female	Hispanic	7	Yes	Medicare	Home	Yes
4	45	Male	Asian	2	No	Medicare	Home	No
5	60	Male	Caucasian	4	Yes	Private	Skilled Nursing	Yes

- 10) The following table gives the number of small-scale units registered with the Directorate of Industries between 1985 and 1991. Show the growth on a trend line by the free hand method. Interpret the results.

K6 (12)

Year	1985	1986	1987	1988	1989	1990	1991	1992
No. of units (in'000)	10	22	36	62	55	40	34	50