



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF COMMERCE, HUMAN SCIENCES AND EDUCATION

DEPARTMENT OF MARKETING, LOGISTICS AND SPORT MANAGEMENT

QUALIFICATION: PROCUREMENT & SUPPLY CHAIN MANAGEMENT, LOGISTICS & SUPPLY CHAIN MANAGEMENT	
QUALIFICATION CODE: 07BPSM, 07BLSC	LEVEL: 6
COURSE CODE: FDA621S	COURSE NAME: FORECASTING AND DATA ANALYSIS
SESSION: DECEMBER 2025	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SUPPLEMENTARY / SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
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MODERATOR	Ms Shinana Paulina

INSTRUCTIONS
<ol style="list-style-type: none">1. Answer ALL the questions.2. Write clearly and neatly.3. Number the answers clearly.4. Round off all numerical answers to three (3) decimal places if possible

THIS QUESTION PAPER CONSISTS OF 6 PAGES (Including this front page)

SECTION A: MULTIPLE CHOICE

[28 Marks]

There are ten multiple-choice questions with several possible choices; choose the best possible answer, e.g. 1.1 A. **Each question is worth two marks.**

Question 1

[20 marks]

- 1.1. Which of the following scenarios would most likely benefit from quantitative forecasting methods? [2 marks]
- A. Predicting customer satisfaction levels for a new product
 - B. Estimating sales for an existing product based on historical sales data
 - C. Deciding on a brand name for a new product
 - D. Determining employee satisfaction from surveys
- 1.2. The accuracy of a forecasting model is most commonly evaluated by: [2 marks]
- A. The length of time it takes to generate the forecast.
 - B. The amount of data used in the model
 - C. The closeness of predicted values to actual outcomes.
 - D. The statistical significance of the model's coefficients.
- 1.3. Which of the following is NOT a common objective of forecasting in business? [2 marks]
- A. Cost reduction in supply chain operations
 - B. Predicting future customer demand
 - C. Setting future marketing and sales targets
 - D. Generating random projections to improve decision-making flexibility
- 1.4. Which type of forecasting method is most appropriate for predicting sales for a new product where historical data is minimal? [2 marks]
- A. Time-series forecasting
 - B. Delphi Method
 - C. Simple Moving Average
 - D. Linear Regression
- 1.5. In time-series analysis, what does the "trend" component represent? [2 marks]
- A. Regular patterns that occur at fixed periods, such as monthly or yearly cycles.
 - B. Unpredictable, random deviations in the data.
 - C. Long-term directional movement in the data, either upwards or downwards.
 - D. Fluctuations that happen due to irregular, external factors.

- 1.6. The weighted moving average method is typically used when: [2 marks]
- A. You believe more recent observations are more important than older ones.
 - B. Every observation has the same importance.
 - C. The data exhibits seasonal variation.
 - D. There is a constant trend in the data.
- 1.7. In Exponential Smoothing, what does the smoothing constant (α) represent? [2 marks]
- A. The number of data points considered in the calculation.
 - B. The weight given to the most recent observation.
 - C. The average of past errors in the forecast.
 - D. The trend adjustment applied to the forecast.
- 1.8. What is a major advantage of using Exponential Smoothing over Moving Average methods? [2 marks]
- A. It is easier to compute and does not require specialized software.
 - B. It can adjust more quickly to changes in the data.
 - C. It can handle seasonal data more efficiently.
 - D. It provides an exact forecast without any error.
- 1.9. In time series forecasting, the cyclical component refers to: [2 marks]
- A. A pattern that repeats at regular intervals, such as daily or monthly.
 - B. Long-term, predictable fluctuations due to economic conditions.
 - C. Short-term fluctuations that are purely random.
 - D. Repeated fluctuations with irregular timing, often related to business cycles.
- 1.10. The Mean Absolute Deviation (MAD) is a commonly used metric to evaluate forecasting models because it: [2 marks]
- A. Measures the average of squared errors.
 - B. Provides a measure of how much forecast errors deviate from the actual values, in absolute terms.
 - C. Measures how well the model fits the data.
 - D. Predicts future values with high accuracy.

QUESTION 2

[8 marks]

Identify the most appropriate forecasting method for each of the following scenarios and briefly justify your choice.

- a) A new technology product with no past sales data.

- b) A supermarket forecasting weekly demand based on past sales trends.
- c) A government panel estimating future GDP growth based on expert opinions.
- d) A car rental company forecasting daily vehicle demand using historical booking records.

SECTION B: STRUCTURE QUESTIONS

[72 Marks]

QUESTION 3

[20 marks]

SunnyBakery Ltd. is a local bakery chain with outlets in Windhoek and Swakopmund. The company’s flagship product, the “Sunny Loaf” has experienced fluctuating monthly sales due to changing consumer demand and seasonal weather patterns. The management wants to forecast future sales to better plan production schedules and raw material orders.

Month	Sales (Units)
January	420
February	440
March	430
April	470
May	480
June	465
July	490
August	505

Required

- a) Using a 3-Month Weighted Moving Average (WMA) with weights 0.5, 0.3, and 0.2 (most recent month given highest weight), compute the forecast for August. [5 marks]
- b) Using Simple Exponential Smoothing with a smoothing constant $\alpha = 0.3$ and an initial forecast for February of 420 units, compute forecasts up to August. [5 marks]
- c) For both methods, calculate the following (use April–August)
 - MAD [8 marks]
 - MAPE [8 marks]
 - Tracking Signal (TS) [4 marks]

Question 4**[22 marks]**

DesertStyle Furniture Ltd., based in Walvis Bay, advertises its modern furniture products through digital and radio platforms. Management suspects that advertising expenditure strongly influences sales volumes. The following data summarize the company's experience over the past 10 months.

Month	Advertising (N\$ '000)	Sales (Units)
1	8	15
2	12	22
3	16	28
4	20	33
5	24	38
6	28	42
7	32	47
8	36	51
9	40	56
10	44	61

Required:

- Identify the independent and dependent variable. [2 marks]
- Show the data in a scatter plot. [4 marks]
- Estimate the regression line $\hat{Y} = a + bX$. [8 marks]
- Predict sales when advertising N\$28,000. [2 marks]
- Interpret the slope coefficient b . [3 marks]
- Compute the coefficient determination R^2 and comment on the goodness of fit of the model. [3 marks]

Question 5:**[30 marks]**

Mr. Shilongo operates a small but rapidly growing retail outlet in the northern town of Tsumeb, specializing in Fast-Moving Consumer Goods (FMCGs). As sales have expanded, managing inventory efficiently has become increasingly challenging. To address this, Mr. Shilongo is considering the use of demand forecasting to improve stock control and avoid both overstocking and stockouts. You have recently joined his business as a student intern focusing on demand planning. Mr. Shilongo seeks your guidance on how to implement forecasting techniques effectively.

Required:

- a) Explain to Mr. Shilongo the importance of demand forecasting for his FMCG retail business. [6 marks]
- b) Using practical examples, outline and describe a systematic demand forecasting process that Mr. Shilongo can adopt, clearly explaining each major step involved. [20 marks]
- c) Recommend and justify the most suitable forecasting method(s) for Mr. Shilongo's business, considering the nature of FMCG demand and data availability. [4 marks]

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