

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)

Chromepet, Chennai - 600 044.

B.B.A. - END SEMESTER EXAMINATIONS APRIL - 2024

SEMESTER - IV

20UBACT4009 - Business Statistics - II

Total Duration : 2 Hrs. 30 Mins.

Total Marks : 60

Section B

Answer any **SIX** questions ($6 \times 5 = 30$ Marks)

1. You are given the following monthly sales data for a product over a period of 12 months:

Month	Sales	Month	Sales
Jan	100	Jul	160
Feb	110	Aug	170
Mar	120	Sep	180
Apr	130	Oct	190
May	140	Nov	200
Jun	150	Dec	210

Using the free-hand method, plot the time series graph for the sales data and identify any trends or patterns in the data.

2. You are tasked with forecasting monthly sales for a retail store based on historical data. You have the sales figures for the past 12 months as follows:

January: 1,000 February: 1,200 March: 1,100 April: 1,300 May: 1,400 June: 1,200 July: 1,300 August: 1,400 September: 1,500 October: 1,600 November: 1,500 December: 1,700.

Using the simple average method, calculate the forecasted sales for the next month.

3. Construct 3 yearly moving averages from the following data and show on a graph against the original data:

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Annual Sales in Lakhs	18	22	20	26	30	22	24	28	32	35

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4. The portfolio consists of three stocks: A, B, and C. The weight (proportion) of each stock in the portfolio and the price per share for each stock at the beginning and end of the three-month period are provided as follows:

Stock	Weight	Price	Price
		Per Share (Month 1)	Per Share (Month 3)
A	0.40	50	55
B	0.30	80	85
C	0.30	70	75

Using weighted index numbers, calculate the performance of the portfolio over the three-month period.

5. Explain the concept of Seasonal Indices in time series analysis.
6. (a) State the meaning of Cost of Living Index. (b) For a given data, the Laspeyre's Index is 112.12 and Paasche's Index is 106.94. Calculate Bowley's Index.
7. Define what sampling errors are and explain how they arise in the process of sampling.
8. Illustrate the stratified random sampling and list out the advantages.

Section C

Answer any **THREE** questions ($3 \times 10 = 30$ Marks)

9. What are the primary components of a time series, and how do they contribute to understanding and analyzing data trends?
10. You are given the following time series data representing the monthly sales (in units) of a product over a period of 12 months:
Sales: 100, 110, 120, 125, 140, 150, 155, 160, 170, 175, 180, 190.
Using the least squares method, determine the linear trend equation for the sales data. Then, predict the sales for the 13th month.
11. The quantities and prices for the base year 2022 and the current year 2023 are provided as follows:

Item	2022		2023	
	Qty.	Price	Qty.	Price
Apples	100	1.00	110	1.20
Oranges	50	1.50	55	1.70
Bananas	200	0.50	210	0.55

Using Laspeyre's Method and Paasche's Method, calculate the index numbers for 2023 relative to 2022.

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12. You are analyzing the price changes of three commodities, A, B, and C, over a two-year period using Fisher's Index Numbers. The quantities and prices for the base year 2022 and the current year 2023 are provided as follows:

Product	2022		2023	
	Qty.	Price	Qty.	Price
A	150	2.50	160	3.00
B	100	4.00	110	4.50
C	200	1.50	210	1.80

Calculate the Fisher's Index Numbers to assess the overall price changes for the commodities between Year 1 and Year 2.

13. Explain the procedures for testing the hypothesis.
