

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.Com. ISM - END SEMESTER EXAMINATIONS APRIL - 2024

SEMESTER - IV

20UBIAT4004 - Business Mathematics and Statistics -II

Total Duration : 2 Hrs. 30 Mins.

Total Marks : 60

Section B

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

1. Define a matrix and explain the types of matrices.
2. Explain the uses of index numbers.
3. Analyze whether the following data satisfies time reversal test or not

Commodity	p_0	q_0	p_1	q_1
A	6	50	10	56
B	2	100	2	120
C	4	60	6	61
D	8.5	30	12	24
E	8	40	16	22

4. Fit a straight line trend to the following time series data:

Year	2004	2005	2006	2007	2008
Sales	80	90	92	83	94

Eliminate trend from the series.

5. Two numbers are in the ratio 3:4. If 6 be added to each term of the ratio then the new ratio will be 4:5. Find the numbers.
6. Using three year moving averages determine the trend and short term fluctuations

Year	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Production	21	22	23	25	24	22	25	26	27	26

7. Given the data:

	Commodities	
	A	B
p_0	1	1
q_0	10	5
p_1	2	X
q_1	5	2

where p and q respectively stand for price and quantity and subscripts stand for time period. Find X if the ratio between Laspeyre's and Paasche's index number is $L:P = 28:27$.

Contd...

8. Discuss the role of time series analysis.

Section C

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

9. Compute the inverse of $\begin{bmatrix} 2 & 3 & 4 \\ 3 & 2 & 1 \\ 1 & 1 & -2 \end{bmatrix}$

10. Two vessels A and B contain mixtures of spirit and water. A mixture of 3 parts from A and 2 parts from B is found to contain 29% of spirit and a mixture of 1 part from A and 9 parts from B is found to contain 34% of spirit. Compute the percentages of spirit in A and B.

11. From the following data compute price index by applying weighted average of price relatives method using i) arithmetic mean and ii) geometric mean

Commodity	P_0 (Rs.)	q_0	P_1 (Rs.)
Sugar	18	20 kg.	20
Flour	12	40 kg.	14
Milk	15	10 lt.	16

12. Compute index numbers of price from the following data by applying i) Laspeyre's ii) Paasche's iii) Bowley's iv) Fisher's

Commodity	2007		2008	
	Price	Qty	Price	Qty
A	2	8	4	6
B	5	10	6	5
C	4	14	5	10
D	2	19	2	13

13. Elaborate the components of time series.
