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 EXAMINATION APRIL/NOV - 2021

SEMESTER - IV

18UBIAT4BS4 –Business Mathematics and Statistics - II

Total Duration : 3 Hrs		Total Marks : 75	
MCQ	: 30 Mins	MCQ	: 15
Descriptive	: 2 Hrs.30 Mins	Descriptive	: 60

Section B

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

1. Solve the following equations by Matrices:
   $3x + 5y = 4$
   $5x + 8y = 6$

2. Brief a note on inversion of A with an illustration.

3. What is binomial distribution? State its assumptions.

4. A bag contains 100 oranges, 10 of which are defective. 5 oranges are drawn with replacement. Find out the probability of getting, (i) exactly 2 defective oranges; (ii) at least 2 defective oranges.

5. A bag contains 5 white balls and 3 red balls. Another bag contains 4 white balls and 5 red balls. If one ball is drawn from each bag find out the probability that, (i) both are white; (ii) both are red.

6. Briefly explain the time reversal test with an example.

7. Bring out the assumptions of ANOVA.

8. Calculate quantity index number from the following data through (i) Laspeyre's method and (ii) Paasche's method:

Commodity	2020		2021	
	Price Rs.	Quantity	Price Rs.	Quantity
I	40	10	42	12
II	35	8	37	10
III	22	10	20	8
IV	64	5	66	12
V	28	8	30	10
VI	14	7	12	5

Section C

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

9. Explain the characteristics of 3rd order square matrix with suitable examples.

10. A book contains 200 misprints distributed randomly. No. of pages in the book is 100. Find out the probability that a page observed at random contains, (i) at least 2 misprints; (ii) at most 3 misprints; (iii) exactly 5 misprints. Given that the value for $e^{-2} = 0.135$.

11. Calculate price index number through Fisher's method and test the consistency of it by factor reversal test.

Commodity	2020		2021	
	Price Rs.	Quantity	Price Rs.	Quantity
Beef	30	20	40	25
Mutton	60	25	120	20
Chicken	25	18	40	20
Pork	15	10	25	8
Fish	30	30	50	32

12. A brand manager is concerned that her brand's share may be unevenly distributed throughout the country. In a survey in which the country was divided into four geographic regions, a random sampling of 100 consumers in each region was surveyed, with the following results:

Details	Region				Total
	NE	NW	SE	SE	
At Peak	40	55	45	50	190
At Trough	60	45	55	50	210
Total	100	100	100	100	400

(i) Calculate the table of observed and expected frequencies for this problem.
(ii) State the null and alternative hypothesis.
(iii) Calculate the sample chi-square value.
(iv) At the 0.05 significance level, test whether brand share is the same across the four regions. (Note: Table Value at 5% level of significance is 7.815)

13. Define Hypothesis. How the hypothesis is tested by using ANOVA? Explain.