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 NOVEMBER -2023
SEMESTER - V
20UBACT5012 - Business Maths and Operations Research

Total Duration : 2 Hrs 30 Mins. Total Marks : 60

Section B

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

1. Two equal sums were lent out at 7% and 5% simple interest respectively. The interest earned on the two loans adds upto Rs.960 for 4 years. Find the sum lent out.

2. State and Prove addition theorem.

3. Find the optimal solution for the assignment problem with the assignment problem with the following cost matrix.

		Area			
		W	**X**	**Y**	**Z**
Salesman	**A**	11	17	8	16
	B	9	7	12	6
	C	13	16	15	12
	D	14	10	12	11

4. The following table gives the characteristics of a project

Job	A	B	C	D	E	F	G	H
Predecessors	-	-	B	A,C	A,C	D	E	F,G
Duration(days)	10	5	3	4	6	6	5	5

Draw the network diagram and find the critical path.

5. Solve the following LPP by graphical method.

Maximize: $Z = 2x_1 + 3x_2$
Subject to: $3x_1 + 2x_2 \leq 12$
$3x_1 + 5x_2 \leq 15$
$x_2 \geq 2$
Where $x_1, x_2 \geq 0$

6. Find the true discount and the present worth of a bill for Rs.1,660 due in 9 months at 5% per annum.

Contd...

7. Find the transportation using North West Corner rule.

				Supply
	2	7	4	5
	3	3	1	8
	5	4	7	7
	1	6	2	14
Demand	7	9	18	34

8. A bag contains 4 white and 6 black balls. Two balls are drawn at random. What is the probability that (a) both are white, (b) both are black, (c) one white and one black?

Section C

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

9. A sum of Rs.50,440 is borrowed to be paid back in three yearly equal installments. What is the annual installment if the rate of interest is 5% per annum compounded yearly?

10. State and Prove bayes theorem.

11. Solve the transportation problem by Modis method.

	Warehouse			
	A	**B**	**C**	**Supply**
Factory	5	1	7	10
	6	4	6	80
	2	1	5	15
Demand	45	20	40	

12. The following indicates the details of the activities of a project. The duration are in days

Activity	1-2	1-3	1-4	2-4	2-5	3-4	4-5
t_0	4	8	6	2	3	2	3
t_m	5	9	8	4	4	3	5
t_p	6	11	12	6	6	4	8

Draw the network diagram. Find the critical path and S.D of project completion time.

13. Use simplex method to solve the LPP.
Maximize: $Z = 4x_1 + 10x_2$
Subject to: $2x_1 + x_2 \leq 50$
$2x_1 + 5x_2 \leq 100$
$2x_1 + 3x_2 \leq 90$
Where $x_1, x_2 \geq 0$

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