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.(BIM) END SEMESTER EXAMINATIONS NOVEMBER-2022
SEMESTER - II

21UBBAT2002 - Elements of Operations Research

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

Section A

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

1. Sketch the origin and history of Operations Research.
2. Show two equations using Maximization Function.
3. One kind of cake requires 200g of flour and 25g of fat, and another kind of cake requires 100g of flour and 50g of fat. Frame the LPP equation to find the maximum number of cakes that can be made from 5kg of flour and 1kg of fat assuming that there is no shortage of the other ingredients, used in making the cakes.
4. Indicate the Total Cost using Least Cost Method for the following transportation problem:

	Destination					**Supply**
Source		D1	D2	D3	D4	
	Q1	3	1	7	4	300
	Q2	2	6	5	9	400
	Q3	8	3	3	2	500
Demand		250	350	400	200	1200

5. What is a non-degenerate solution? Illustrate.
6. Differentiate between CPM and PERT.
7. Solve the following pay-off matrix:

	Player B			
Player A	**Strategies**	I	II	III
	I	6	8	6
	II	4	12	2

8. Ascertain the purpose of saddle point. Illustrate.

Contd...

Section B

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

9. Describe the techniques of Operations Research to be applied in the modern business world during the post pandemic period with suitable examples.

10. Solve the given linear programming problems graphically:
    Maximize: $Z = 8x + y$
    and the constraints are :
    $x + y \leq 40$,
    $2x + y \leq 60$,
    $x \geq 0$, $y \geq 0$

11. Solve the given transportation problem using Vogel's approximation method.

	Destination Centers				**Supply**
		D1	D2	D3	D4	
Factory	F1	3	2	7	6	50
	F2	7	5	2	3	60
	F3	2	5	4	5	25
Demand		60	40	20	15	

12. A small project consisting of eight activities has the following characteristics:

Activity	**Preceeding Activity**	**Most Optimistic Time**	**Most Likely Time**	**Most Pesimistic Time**
A	-	2	4	12
B	-	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B,C	9	9	9
G	D	3	3.5	7
H	E,F,G	5	5	5

    (i) Draw the PERT network for the project.
    (ii) Prepare the activity schedule for the project.
    (iii) Determine the critical path.
    (iv) If a 30-week deadline is imposed, what is the probability that the project will be finished within the time limit?

13. Solve the following pay-off matrix:

	Player B					
	Strategies	I	II	III	IV	V
Player A	I	9	3	1	8	0
	II	6	5	4	6	7
	III	2	4	3	3	8
	IV	5	6	2	2	1

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G	D	3	3.5	7
H	E,F,G	5	5	5

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	II	6	5	4	6	7
	III	2	4	3	3	8
	IV	5	6	2	2	1

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