

(i) Printed Pages: 4

Roll No.

(ii) Questions : 14

Sub. Code :

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Exam. Code :

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Bachelor of Business Administration 3rd Semester

(1129)

OPERATION RESEARCH

Paper—BBA-202

Time Allowed : Three Hours]

[Maximum Marks : 80

Note :— (1) Attempt any *four* questions from Section-A. Each question carries **5** marks.

(2) Attempt any *two* questions each from Section-B and Section-C. Each question carries **15** marks.

SECTION—A (4×5=20)

I. Solve the game :

	B	
A	5	1
	3	4

II. Solve the LPP :

$$Z(\max) = 3x_1 + 4x_2$$

$$\text{sub. to : } x_1 - x_2 \leq -1$$

$$-x_1 + x_2 \leq 0$$

III. Solve the transportation problem :

Warehouse —		W_1	W_2	W_3	Supply
Plant	A	7	6	9	20
	B	5	7	3	28
	C	4	5	8	17
	Demand	21	25	19	65

IV. Solve the following Cost Matrixed Assignment :

		Machine			
		M_1	M_2	M_3	M_4
Jobs	J_1	15	11	13	15
	J_2	17	12	12	13
	J_3	14	15	10	14
	J_4	16	13	11	17

V. Define Operation Research.

VI. Explain 'MaxMin-MiniMax principle'.

SECTION—B ($2 \times 15 = 30$)

VII. Solve the Transportation Problem and Test its optimality :

		Centres				Available
Factories	A	10	8	7	12	500
	B	12	13	6	10	500
	C	8	10	12	14	900
	Demand	700	550	450	300	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> 1900 2000 </div>

VIII. Solve the Assignment in Minimisation :

	Courses			
Professors	2	10	9	7
	15	4	14	8
	13	14	16	11
	4	15	13	9

Above figures are the preparation time for all courses.

IX. Solve the LPP by Simplex Method :

$$Z(\max) = 10x_1 + 5x_2$$

$$\text{sub. to : } 4x_1 + 5x_2 \leq 100$$

$$5x_1 + 2x_2 \leq 80$$

$$\text{where } x_1, x_2 \geq 0$$

X. Explain the role of Operation Research in Management.

SECTION—C (2×15=30)

XI. Explain M/M/I and M/M/S queuing models in detail.

XII. Determine the optimal sequencing and total elapsed time of AB machines in the order of \overrightarrow{AB} .

Jobs	1	2	3	4	5	6
Machine A	7	4	2	5	9	8
Machine B	3	8	6	6	4	1

XIII.Explain the dominance principle in game theory using the following example :

		Firm B			
		B ₁	B ₂	B ₃	B ₄
Firm A	A ₁	35	65	25	05
	A ₂	30	20	15	00
	A ₃	40	50	00	10
	A ₄	55	60	10	15

XIV.Explain the following terms :

- (1) Pay off Matrix
- (2) Saddle Point
- (3) Pure and Mixed Strategy
- (4) 'No Passing Rule' in Sequencing Problems
- (5) Dummy in Transportation Problem.