

II Semester M.B.A. Degree Examination, December 2022 (CBCS 2018-19 Scheme) MANAGEMENT

Paper – 2.6 : Quantitative Techniques and Operations Research

Time : 3 Hours

Max. Marks: 70

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SECTION - A

Answer any five questions from the following. Each question carries 5 marks.

(5×5=25)

- 1. Explain the role and importance of operation research in managerial decisions.
- 2. What is sequencing problem ? Give its essential characteristics.
- 3. Solve the following LPP by graphic method.

Maximise Z = 375x + 425ySubject to $5x + 4y \le 200$ $3x + 5y \le 150$

 $8x + 4y \ge 80$

 $5x + 4y \ge 100$

and x, $y \ge 0$

4. Solve the problem of assignment for the given table to maximise the sales.

			Machines						
		Α	в	С	D	E			
	1	32	38	40	28	40			
Jobs	2	40	24	28	21	36			
	3	41	27	33	30	37			
	4	22	38	41	36	36			
	5	29	33	40	35	39			
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5. A truck owner estimates that maintenance cost per year of a truck whose purchase price is Rs. 1,50,000 and the resale value of the truck will be

Year	1	2	3	4	5	6	
Maintenance cost :	10,000	50,000	20,000	25,000	30,000	40,000	
Resale value :	1,30,000	1,20,000	1,15,000	1,05,000	90,000	75,000	

Determine at which time it is profitable to replace the truck.

A dealer sells a particular model of washing machine for which the probability distribution of daily demand as given below :

Demand/day :	0	: 1 ₩010	2	3	4	5
Probability :	0.05	0.25	0.20	0.25	0.10	0.15

Find the average demand of washing machine per day using the following random numbers

67, 84, 02, 77, 90, 14, 25, 65, 45, 82.

 Determine the optimal sequence of jobs that minimizes total elapsed time. Jobs are processed in the order M₁ M₂ M₃.

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Job	A	В	С	D	E	F	G
M ₁	3	8	7	4	9	8	7
M ₂	4	3	2	5	1	4	3
M ₃	6	7	5	11	5	6	12

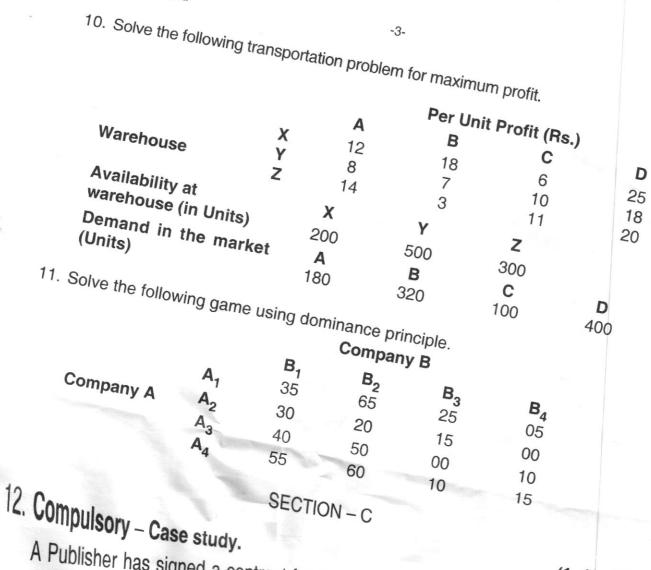
SECTION - B

Answer any three questions from the following. Each question carries 10 marks. (3×10=30)

8. Solve the given LPP by Simplex method.

Maximise	$Z = 3x_1 + 5x_2 + 4x_3$
Subject to	$2x_1 + 3x_2 \le 8$
	$2x_2 + 5x_3 \le 10$
	$3x_1 + 2x_2 + 4x_3 \le 15$
	and $x_1, x_2, x_3 \ge 0$

9. What is a game in game theory ? What are the properties of a game ? Explain the 'best strategy' on the basis of minimax criterion of optimality.



A Publisher has signed a contract for the publication of a book. What is the (1×15=15) earliest time that the book can be ready for distribution ? Estimates are given

Activity :	Α	В	С	D	E	F	G	н	Ι	J
Precedence :	_	_	A, B	А	C, D	Е	E	C, D	F, G	I, H
Most likely :	8	2	2	6	4	3	4	6	8	1
Optimistic	4	2	1	4	3	3	3	4	6	1
Dessimistic :	10	2	3	12	5	3	5	9	16	1

1) Draw a network and find the critical path, what is the expected length of the critical path and its variance ?

2) What is the probability that length of the critical path does not exceed

b) 36 weeks a) 32 weeks

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