MBAC 2004

M.B.A. DEGREE EXAMINATION, JANUARY 2022.

Second Semester

OPERATIONS MANAGEMENT/OPERATIONS RESEARCH AND MANAGEMENT

Time : Three hours Maximum : 100 marks

PART A — (5 × 6 = 30 marks)

Answer any FIVE questions out of Eight questions.

1. Illustrate the importance of process planning.

2. State the objectives of production planning

3. Explain the different types of inventories.

4. Find initial solution for the following transportation problem using Least Cost method.

	D1	D2	D3	D4	Availability
S1	19	30	50	10	7
S2	70	30	40	60	9
S3	40	8	70	20	18
Requirements	5	8	7	14	

5. Solve the following game

		Player B				
		B1	B2	B3	B4	B5
Player A	A1	9	3	1	8	0
	A2	6	5	4	6	7
	A3	2	4	3	3	8
	A4	5	6	2	2	1

6. In a railway marshalling yard, trains arrive at the rate of 30 trains per day. Assuming that arrival time follows an Poisson distribution and the service time distribution is exponential with an average of 36 minutes. Find the length of the system.

7. Draw a network diagram for the following project

Job	Immediate predecessors
A	–
B	A
C	A
D	B
E	C, D
F	E

8. What is Goal programming? Explain.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions out of Eight questions.

9. Analyse the factors influencing manufacturing plant location.

10. Elucidate the features, advantages and disadvantages of product layout.

11. Discuss the applications of operations research.

12. Solve the following Linear Programming Problem using graphical method.

Maximize $z = 5x_1 + 6x_2$

Subject to the constraints

$2x_1 + 4x_2 \leq 42$

$6x_1 + 3x_2 \leq 90$

$x_1, x_2 \geq 0$

13. Solve the following transportation problem

	D1	D2	D3	D4	
O1	10	7	3	6	3
O2	1	6	8	3	5
O3	7	4	5	3	7
	3	2	6	4	

14. Solve the following game using graphical method

	B1	B2
A1	1	–3
A2	3	5
A3	–1	6
A4	4	1
A5	2	2
A6	–5	0

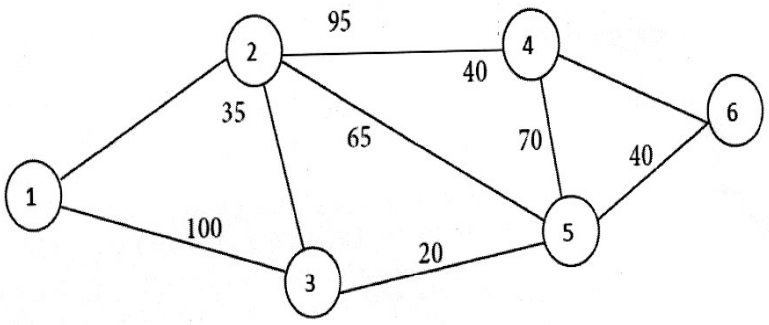
15. At a doctor's clinic patients arrive at an average rate of 5 patients per hour. It has been observed the doctor takes an average of 8 minutes per hour. Arrival time is based on Poisson and service is based on exponential distribution. Find

    (a) The average number of patients in the doctor's clinic.

    (b) The average number of patients waiting for their turn.

    (c) The average time that a patient spends in the clinic.

16. Find the critical path and the project duration for the following project.



PART C — (1 × 20 = 20 marks)

Case Study (Compulsory Question)

17. A production plant has nine departments and the present layout is shown in the following figure.

A	D	G
B	E	H
C	F	I

The movement of materials between the departments is shown in the load summary table below.

From \ To	B	F	I
A	90		
D	180	200	
E		90	270
H	630		

Obtain a good layout considering the unit costs of movement is Rs.10 per unit distance per load for all movements.

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