

MBAC 2004

M.B.A. DEGREE EXAMINATION, JUNE 2014.

Second Semester

General, Finance, Marketing, HRM, IB, RM, Tourism,
OSCM, IM, HM

OPERATIONS MANAGEMENT/OPERATIONS RESEARCH AND MANAGEMENT

(2012-13 Batch onwards)

Time : Three hours

Maximum : 100 marks

PART A — (5 × 6 = 30 marks)

Answer any FIVE questions.

1. What do you mean by Production Management and Production Planning?
2. What are the functions of Production Manager?
3. What is Operations Research? What are the main characteristics of Operations Research?
4. Give the matrix form of representing a general LPP.

5. Construct a network for a project whose activities and their predecessor relationship are given in Table.

Activity	A	B	C	D	E	F	G	H	I	J	K
Predecessor	-	-	-	A	B	B	C	D	E	H, I	F, G

6. Distinguish between PERT and CPM.
7. Solve the Game Theory whose pay-off matrix is given by

		Player B		
		B ₁	B ₂	B ₁
Player A	A ₁	1	3	1
	A ₂	0	-4	-3
	A ₃	1	5	-1

8. In a public telephone booth, the arrivals on an average are 15 per hour. A call on an average takes three minutes. If there is just one Phone. Find (Queuing Theory)
- (a) The expected number of callers in the booth at any time.
- (b) The proportion of the time, the booth is expected to be idle?

- (a) Draw the project Network.
- (b) Find the critical path.
- (c) Find the probability of the project being completed in 31 days.

PART C — (1 × 20 = 20 marks)

Compulsory

17. Find the initial basic feasible solution to the following transportation problem using VAM, given the cost Matrix.

	D ₁	D ₂	D ₃	D ₄	Supply
S ₁	20	25	28	31	200
S ₂	32	28	32	41	180
S ₃	18	35	24	32	110
Demand	150	40	180	170	

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

9. What is Plant Layout? Explain the Advantages of the Perfect Plant Layout.
10. What is Production Planning and Control? What are its main Functions?
11. Solve the following LPF by Graphical Method.

$$\text{Minimize } Z = 20x_1 + 10x_2$$

$$\text{Subject to, } x_1 + 2x_2 \leq 40$$

$$3x_1 + x_2 \geq 30$$

$$4x_1 + 3x_2 \geq 60$$

$$x_1, x_2 \geq 0.$$

12. Construct a dual for the following primal.

$$\text{Minimize } Z = 6x_1 - 4x_2 + 4x_3$$

Subject to constraints,

$$6x_1 - 10x_2 + 4x_3 \geq 14 \dots\dots\dots \text{(i)}$$

$$6x_1 - 2x_2 + 6x_3 \geq 10 \dots\dots\dots \text{(ii)}$$

$$7x_1 - 2x_2 + 5x_3 \leq 20 \dots\dots\dots \text{(iii)}$$

$$x_1 - 4x_2 + 5x_3 \geq 3 \dots\dots\dots \text{(iv)}$$

$$4x_1 + 7x_2 - 4x_3 \geq 20 \dots\dots\dots \text{(v)}$$

$$\text{Where } x_1, x_2, x_3 \geq 0.$$

13. Determine an initial basic feasible solution to the following transportation problem using North West Corner Rule.

	D ₁	D ₂	D ₃	D ₄	Supply
O ₁	6	4	1	5	14
O ₂	8	9	2	7	16
O ₃	4	3	6	2	5
Required	6	10	15	4	35

14. The company plans to consume 760 pieces of a particular component. Past records indicate that purchasing department had used Rs. 12,000 for placing 15,000 orders. The average inventory was valued at Rs. 45,000 and the total storage cost was Rs. 7,650 which included wages, rent, taxes, insurance etc., related to store department. The company borrows capital at the rate of 10% a year.

If the price of a component is Rs. 12 and the order size is of 10 components. Determine purchase cost, Purchase expenses, storage expenses, capital cost and total cost per year.

15. Solve the following Assignment problem shown in table using Hungarian method. The matrix entries are processing time of each man in hours.

	Men				
	1	2	3	4	5
I	20	15	18	20	25
II	18	20	12	14	15
III	21	23	25	27	25
IV	17	18	21	23	20
V	18	18	16	19	20

16. The following table shows the jobs of a network along with their time estimates. The time estimates are in days.

Job	1-2	1-6	2-3	2-4	3-5
a	3	2	6	2	5
m	6	5	12	5	11
b	15	14	30	8	17
Job	4-5	5-8	6-7	7-8	
a	3	1	3	4	
m	6	4	9	19	
b	15	7	27	28	