(SF)

MBA 15

III Semester M.B.A. Examination, August 2011
OPERATION RESEARCH

Time : 3 Hours Max. Marks : 75

Instructions *: Question paper is divided into* ***three*** *groups.*
Each *group is of* ***25*** *marks.*
Figure to the ***right*** *in bracket* ***indicates*** *mark.*
Assume *suitable data* ***if necessary****.*

GROUP – A

Answer **any three** questions. (Question No. **1** is **compulsory**) :

1. What do you mean by operation research ? What is its scope ? **(5)**

2. Solve the following LPP :

   Maximize $Z = 3X_1 + 9X_2$

   Subject to constraint

   $X_1 + 4X_2 \leq 8$
   $X_1 + 2X_2 \leq 4$
   $X_1 X_2 \geq 0$ **(10)**

3. Solve the following assignment problem for minimization. **(10)**

Jobs	**Machine**					
		M1	**M2**	**M3**	**M4**	**M5**
A	4		6	10	5	6
B	7		4	8	5	4
C	12		6	9	6	2
D	9		3	7	2	3
E	6		5	5	3	8

P.T.O.

4. A film produce three. These products are proposed on three different machines. The time required to manufacture one unit of each of the three products and the daily capacity of three machines are given in the table below.

Machine	**Time per unit (minutes)**			**Machine Capacity (Min/day)**
	Product 1	**Product 2**	**Product 3**	
M1	2	3	2	440
M2	4	–	3	470
M3	2	5	–	430

It is required to determine the daily number of units to be manufactured for each of the three products. The profit per unit for product 1, 2 and 3 is Rs. 4, Rs. 3 and Rs. 6 respectively. It is assumed that all the amounts produced are consumed the market. Formulate the mathematical (L.P.) model that will maximize the daily profit. **(10)**

5. Solve the following transportation problem.

	W1	**W2**	**W3**	**W4**	**Supply**
F1	90	90	100	100	200
F2	50	70	130	85	100
Demand	75	100	100	30	

(10)

GROUP – B

Answer **any three** questions. (Question No. **6** is **compulsory**) :

6. Explain any two situations under which decision are taken. **(5)**

7. **(10)**

				Player B
		B1	**B2**	**B3**
Player A	**A1**	1	2	7
	A2	6	7	2
	A3	6	6	1

8. Solve the following jobs machine problem given the processing time is shown on each machine. Calculate total Elasped time.

JOB	M1	M2	M3
1	13	3	8
2	18	8	4
3	8	6	13
4	23	6	8

(10)

9. A project schedule has the following features :

Activity	Duration
	(Weeks)
1 – 2	4
1 – 3	1
2 – 4	1
3 – 4	1
3 – 5	6
4 – 9	5
5 – 6	4
5 – 7	8
6 – 8	1
7 – 8	2
8 – 10	5
9 – 10	7

Construct the network diagram. **(10)**

10. Explain the benefits and limitation of waiting line theory. **(10)**

GROUP – C

All questions are **compulsory** :

11. Fill in the blanks (**Each** question carries **2** marks) :
    i) Time required by each job on each machine is called as _____
    ii) PERT stands for _____
    iii) When all influencing factor are not known to decision maker it is called as _____
    iv) In transportation when supply and demand do not match it is called as _____
    v) A variable that has no meaning in a physical sense but act as a tool to help generate an initial lp solution is known as _____

12. Multiple choice question (**Each** question carries **2** marks) :
    i) Transportation problem is type of _____
    a) LPP problem b) Queining theory
    c) Game theory d) CPM
    ii) CPM stands for _____
    a) Correct path method b) Correlation path method
    c) Critical path method d) None of these
    iii) Decision are taken under how many situations _____
    a) 1 b) 2 c) 3 d) 4
    iv) When more than one activity comes and joins the event is known as _____
    a) Bust event b) Merge event c) Activity d) None of these
    v) Under which policy an item is replaced immediately after its failure _____
    a) Individual replacement b) Group replacement
    c) Both d) None of these

13. **True** or **false** (**Each** question carries **1** mark) :
    i) LPP stands for linear programming problem.
    ii) If game does not have saddle point, two players can use the pure strategies as their optimal strategies.
    iii) A condition that arises when there is a tie in the values of outgoing variable is called as non degeneracy.
    iv) For the assignment problem the number of row should be equal to number of coloums.
    v) CPM is used for project involving activities of non repetitive nature.

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