INDIAN INSTITUTE OF MATERIALS MANAGEMENT

Post Graduate Diploma in Materials Management

PAPER – 18 C

OPERATIONS RESEARCH.

DATE: 17.12.2011   Max. Marks: 100
TIME: 2.00 p.m to 5.00 p.m.   Duration: 03 Hrs.

Instructions:
1. The question paper is in two parts.
2. Part A is compulsory. Each question carries one mark
3. In part B answers 5 questions out of 6. Each question carries 16 marks.
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PART A

Q.1. State true or false.   **Marks: 10**

1.1 Operations Research is a science of heuristics.

1.2 ABC Analysis Technique is type of PERT technique.

1.3 The maximum stock level represents safety stock.

1.4 Goal programming can generate an integer solution.

1.5 CPM is used for network control.

1.6 In maximization problem, the objective function is of minimizing cost.

1.7 Stochastic models can be applied to managerial decision making.

1.8 A queue is a waiting line.

1.9 Game Theory is a particular class of linear programming.

1.10 An event is a discrete variable.

Q.2   Fill in the blanks.   **Marks: 05**

2.1 A maximizing player minimizes his _____.

2.2 PERT can also be used in planjing the _____.

2.3 The renege is a type of behaviour in a _____.

2.4 Theory of random numbers is used in _____.

2.5 Stock outs can be minimized with the help of _____.

Q.3 Expand the following   **Marks: 05**

3.1 SRO

3.2 NIFO

3.3 GP

3.4 CPM

3.5 BS

PART B

Q.4. Solve the LPP problem using Graphical Method: Marks : 16

Minimize $Z = 3X_1 + 2X_2$

Subject to the constraints

$$5X_1 + X_2 <= 10$$
$$X_1 + X_2 >= 6$$
$$X_1 + 4X_2 >= 12$$
$$X_1 , X_2 >= 0$$

Q.5 Solve the following transportation problem.   Marks : 16

1. North west corner method
2. Vogel's approximation method

From	To				Available
	A	**B**	**C**	**D**	
I	2	3	11	7	6
II	1	0	6	1	1
III	5	8	15	9	10
Requirement	7	5	3	2	

Q.**6**. From the table of activities associated with the project given below:

i)   Draw the network and find the critical path

ii)   Find the critical project duration.   Marks : 16

Activities	A	B	C	D	E	F	G
Time	2	1	3	2	1	3	1
Predecessor	**	**	A	A,B	C, D	B, D	E, F

Q.7   Marks : 16

Solve the LPP using Simplex Method:

Maximize $Z = 3X_1 + 5X_2 + 4X_3$

Subject to the constraints:

$$2X_1 + X_2 <= 8$$
$$2X_2 + 5X_3 <= 10$$
$$3X_1 + 2X_2 + 4X_3 <= 15$$
$$X_1, X_2, X_3 >= 0$$

Q.8. Solve the following game after reducing to 2 X 2 game.　　　　Marks : 16

Player A	Player B		
	B1	B2	B3
A1	1	7	2
A2	6	2	7
A3	5	1	6

Q.9. A department of a company has 5 jobs with 5 employees. The time that each employee takes to perform the job is given in the effectiveness matrix. How should be jobs be allocated so as to minimize the time?　　　　Marks : 16

		EMPLOYEES				
		I	II	III	IV	V
JOBS	A	10	5	13	15	16
	B	3	9	18	13	6
	C	10	7	2	2	2
	D	7	11	9	7	12
	E	7	9	10	4	12

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