01204

MANAGEMENT PROGRAMME

Term-End Examination

December, 2018

MS-051 : OPERATIONS RESEARCH

Time : 3 hours *Maximum Marks : 100*

(Weightage 70%)

Note : (i) Attempt any five questions.

(ii) All questions carry equal marks.

1. Write an essay on the scope of operations research, explaining briefly the main phases of an OR study and techniques used in solving OR problems.

2. A firm owns facilities at six places. It has manufacturing plants at places A, B and C with daily production of 50, 40 and 60 units respectively. At point D, E and F it has three warehouses with daily demands of 20, 95 and 35 units respectively. Per unit shipping costs are given in the following table. If the firm wants to minimize its total transportation cost, how should to route its products ? Use North-West corner method to find an initial basic feasible solution.

		Warehouse		
		D	E	F
	A	6	4	1
Plant	B	3	8	7
	C	4	4	2

3. What is an integer linear programming problem ? How does the optimal solution of an integer programming problem compared with that of the linear programming problem ?

4. The Taj service station has a central store where service mechanics arrive to take spare parts for the jobs they work upon. The mechanics wait in queue if necessary and are served on a first come first serve basis. The store is manned by one attendent who can attend 8 mechanics in an hour on an average. The arrival rate of the mechanics averages 6 per hour. Assuming that the pattern of mechanics arrival is Poisson distributed and the servicing time is exponentially distributed, Determine :

   (i) Expected time spent by a mechanic in the system.

   (ii) Expected time spent by a mechanic in the queue.

   (iii) Expected number of mechanics in the queue.

5. Consider the game of matching coins. Two players A and B each put down a coin. If coins match i.e. both are head or both are tails, A gets rewarded by 1 otherwise B. However matching on heads gives a double premium. Obtain the best strategies for both players and the value of the game.

6. Discuss Monte Carlo Simulation. Illustrate how would you use it in solving inventory control problems.

7. Write short notes on **any two** of the following :

   (a) Sensitivity Analysis

   (b) The general Quadratic Programming Problem

   (c) The M/M/C system

   (d) Saddle points