



DOON UNIVERSITY, DEHRADUN
Mid Term Examination, Second Semester, 2013
School of Management

MBA

Course: MMS- 510: Management Science

Time Allowed: 2Hours

Maximum Marks: 30

SECTION: A . CASE STUDY

(Marks: 10)

A firm can produce three types of cloth say A, B and C. Three kinds of wool are required for it, say red wool, green wool, and blue wool. One unit length of type A cloth needs 2yards of red wool and 3 yards of blue wool; one unit length of type B cloth needs 3 yards of red wool, 2 yards of green wool and 2 yards of blue wool; and one unit of type C cloth needs 5 yards of green wool and 4 yards of blue wool. The firm has only stock of 8 yards of red wool, 10 yards of green wool and 15 yards of blue wool. It is assumed that the income obtained from one unit length of type A cloth is Rs 3.00, of type B cloth is Rs 5.00 and of type C cloth is Rs4.00.

Determine how the firm use its available material in order to maximize the income from finished cloth.

SECTION: B. Attempt any four questions and each carry equal marks.

(Marks: 5X4=20)

1. A company has four plants P_1, P_2, P_3, P_4 from which it supplies to three markets M_1, M_2, M_3, M_4 . Determine the optimal transportation plan from the following data:

PLANT \ MARKET	P1	P2	P3	P4	REQUIREMENT
M_1	19	14	23	11	11
M_2	15	16	12	21	13
M_3	30	25	16	39	19
AVAILABILITY	6	10	12	15	43

2. What is basic queuing process & explain M/M/1 Queuing model?
3. *“Linear programming is one of the most frequently and successfully employed Operational Research techniques to managerial and business decisions”*. Explain this statement with some examples.
4. Describe the transportation problem with its mathematical model & discuss the various methods to determine initial basic feasible solution and optimal solution.
5. The TAJ Service Station has a central store where service mechanics arrive to take spare parts for the job they work upon. The mechanics wait in a queue if necessary and are served on a FCFS basis. The store is manned by one attendant who can attend 8 mechanics in an hour on an average. The arrival rate of the mechanics average 6 per hour. Assuming that the pattern of mechanics arrivals is Poisson distribution and the servicing time is exponentially distributed, determine the system performance.
6. What is an Assignment Problem? Is it true to say that it is a special type of Transportation Problem? Explain.
7. Solve the following LPP:

Maximize $Z = 4x_1 + 6x_2 + 2x_3$
 Subject to Constraints,

$$x_1 + x_2 + x_3 \leq 3$$

$$x_1 + 4x_2 + 7x_3 \leq 9$$

$$x_1, x_2, x_3 \geq 0$$