Total No. of Questions :8] *[Total No. of Printed Pages : 3*

Roll No .....

MCA-301

MCA. III Semester

Examination, June 2017

Computer Oriented Optimization Techniques

Time : Three Hours

Maximum Marks : 70

Note: Attempt any five questions out of eight.

1. a) Solve the following problem graphically.

Maximize $Z = 2x_1 + x_2$,

Subject to $x_1 + 2x_2 \le 10$,

$x_1 + x_2 \le 6$,

$x_1, x_2 \le 2$,

$x_1, 2x_2 \le 1$,

$x_1, x_2 \ge 0$.

b) State the standard form of general LPP.

2. a) Obtain the dual problem of the following primal problem:

Minimize $Z = x_1 - 3x_2 - 2x_3$,

Subject to the constraints:

$$3x_1 - x_2 - 2x_3 \le 7,$$

$$2x_1 - 4x_2 \ge 12,$$

$$-4x_1 + 3x_2 + 8x_3 = 10$$

and $x_1, x_2 \ge 0$ and x_3 is unrestricted.

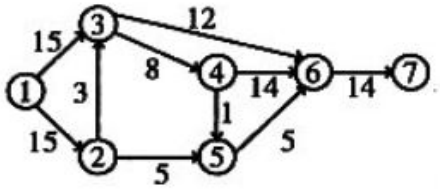
b) What is Operation Research? Discuss the significance and Scope of operation research.

3. a) Obtain the initial basic feasible solution of the given a TP using matrix minima method.

	w_1	w_2	w_3	Supply
F_1	7	6	9	20
F_2	5	7	3	28
F_3	4	5	8	17
Demand	21	25	19	

b) Write and explain algorithm for processing n jobs through 3 or mok machines.

4. a) Find the minimum time of completion of the project i.e. critical path for the following network;



b) Explain PERT and its applications.

5. a) Explain the operating characteristics of queuing system.

b) A T.V. repairman finds that the time spent on his job has an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they came in and if the arrivals of sets is approximately Poisson with an average rate of 10 per 8 hour day, what is repairman's expected idle time each day? How many jobs are aheads of the average set just brought in?

6. a) The demand for an item is 18000 units per year. The holding cost is Rs. 1.20 per unit time and the cost of shortage is Rs 5.00. The production cost is Rs. 400.00. Assuming that replacement rate is instantaneous, optimality the optimum order quantity.

   b) Describe economic order quantity

7. a) Explain the queuing model (M/M/S : N/FCFS).

   b) What is Dynamic programming? Explain Bellman's optimality principles.

8. a) What are the three common errors in the construction of networks.

   b) What is dummy activity and when it is needed?

   c) What do you mean by degeneracy in a Transportation problem also explain how degeneracy in a Transportation problem may be resolved?

******

7 33