

Roll No.

Total No. of Questions : 07]

AIM LIBRARY

[Total No. of Pages : 02

MBA (Sem. - 3rd)

APPLIED OPERATIONS RESEARCH

SUBJECT CODE : MB - 301 (2 k8 & onwards)

Paper ID : [C0197]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.

Section - A

Q1)

(10 × 2 = 20)

- a) Duality in linear programming.
- b) Differentiate between Transportation Problem and Assignment Problem.
- c) Explain the terms Reneging, Jockeying and queue discipline in queue system.
- d) Economic lot size.
- e) Differentiate between Linear Programming and Dynamic Programming.
- f) Pure and Mixed Strategies.
- g) Degeneracy in transportation problem.
- h) Explain the terms Optimistic time and Most Likely time in PERT.
- i) Explain expected value of perfect information.
- j) What is group replacement? Give example.

Section - B

(4 × 10 = 40)

Q2) Minimize $C = 2x_1 + 4x_2$ s.t.

$2x_1 + x_2 \geq 14$; $x_1 + 3x_2 \geq 18$; $x_1 + x_2 \geq 12$; $x_1, x_2 \geq 0$. Solve using Simplex algorithm.

Q3) A tax consulting firm has three counters in its office to receive people who have problems concerning their income and sales taxes. On the average 48 persons arrive in an 8 - hour day. Each tax advisor spends 15 minutes on an average on an arrival. 16 the arrivals are Poissonly distributed and service times are according to exponential distribution find out.

- (a) Average number of customers in the system;
- (b) Average number of customers waiting to be served;
- (c) Average time a customer spends in the system.
- (d) Average waiting time for a customer.
- (e) The number of hours each week a tax advisor spends performing his job.
- (f) Probability that a customer has to wait before he gets service.
- (g) Expected number of idle tax advisors at any specified time.

- Q4)** (a) Explain the basic characteristics of an inventory system.
 (b) Use graphical method in solving the following game and find the value of the game.

Player - A	Player - B			
	B ₁	B ₂	B ₃	B ₄
A ₁	2	2	3	-2
A ₂	4	3	2	6

- Q5)** An electronic equipment has 5000 IC's. If any one IC fails it has to be replaced. Cost of replacing a single IC is only Rs 10. The data of failures is given below:

Month :	1	2	3	4	5	6
% surviving at the end of each month:	.03	.10	.30	.40	.15	.02

obtain the best replacement policy i.e. replace the individual IC's which fail during fixed interval.

- Q6)** State and differentiate between PERT and CPM. What are the objectives of PERT & CPM? What are the assumptions on which PERT / CPM analysis is done for the projects? Which one of these (PERT & CPM) do you advocate for execution of ultra mega power projects in India.

- Q7)** Write short notes on :

- (a) Various methods useful for decision making under uncertainty.
- (b) Methodology of operations Research.
