



Printed Pages : 7

TME - 601

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 4093

Roll No.

**B. Tech.**

(SEM. VI) EXAMINATION, 2008-09

**OPERATIONS RESEARCH**

Time : 3 Hours]

[Total Marks : 100

- Note :
- (1) Attempt **all** questions.
  - (2) Attempt **two** parts from each question.
  - (3) All questions carry **equal** marks.
  - (4) Assume suitably missing data if any.

- 1 (a) What is 'Operations Research' ? Describe OR Methodology with an example.
- (b) Air-Company forecasts need of air-hostess for its operations for next 4 months :

Month	April	May	June	July
Air - hostess	80	60	110	90

It needs one month training for an air-hostess to be prepared to get ready for service, during which the trainee gets Rs.6000 as

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stipend. The salary of airhostess is Rs.25,000 per month. All recruitments are made on first of every month, whereas all terminations and resignations are on last date of the month. If company has to pay Rs.20,000 to air-hostess if her services are terminated; create an LPP for deciding recruitment and termination plan of the company. Today it is 28 Feb. and there are 90 air-hostesses on roll. It is observed that 10% air-hostesses leave the job of their own every month.

- (c) Convert the following LPP into its dual and solve using Simplex method :

$$\text{Maximize } Z = 5x_1 + 10x_2 + 8x_3$$

$$\text{subject to } 3x_1 + 5x_2 + 2x_3 \leq 60$$

Month	April	May	June	July
Air hostess	80	110	90	90

$$4x_1 + 4x_2 + 4x_3 \leq 72$$

$$2x_1 + 4x_2 + 5x_3 \leq 100$$

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

- (b) A railway reservation office has 2 counters. The arrival of passengers is in Poisson and 8 passengers arrive per hr. It takes 10 minutes to serve a passenger (exponentially distributed). Operation of counter costs Rs.100/- per hr. and time of passenger is estimated @ Rs.400/- hr. Determine optimum no. of service counters.
- (c) What is process of 'Monte-Carlo Simulation' ? What are its application? Why it is preferred over mathematical models at places?

