

**S.D.E.**

**M.B.A. (E) SEM-III (2 Year Course) : WINTER - 2018**

**SUBJECT: MANAGEMENT SCIENCE AND DECISION TECHNOLOGIES**

Day: Thursday  
Date: 06/12/2018

**W-2018-4746**

Time: 10.00 AM TO 1.00 PM  
Max. Marks: 70

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**N.B.:**

- 1) Attempt any **FOUR** questions from Section –I.
  - 2) Attempt **any TWO** questions from Section –II.
  - 3) Answer to both the sections should be written in **SAPARATE** answer book.
  - 4) Figures to the right indicate **FULL** marks.
  - 5) Use of non programmable **CALCULATOR** is allowed.
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**SECTION-I**

- Q.1** Give a brief account of the historical background relating to origin and development of Operations Research techniques. **(10)**
- Q.2** Mention the different Schools of Management. Discuss the contributions of the Behavioral science School. **(10)**
- Q.3** A committee of four has to be formed from among 3 economists, 4 engineers, 2 statisticians and 1 doctor. **(10)**
- i) What is the probability that each of the four professions is represented on the committee?
  - ii) What is the probability that the committee consists of the doctor and at least one economist?
- Q.4** What do you mean by 'Transportation Problem'? Explain any one method of determining the initial feasible solution for a Transportation Problem. **(10)**
- Q.5** Write short notes on any **TWO** of the following: **(10)**
- a) Decision and risk analysis
  - b) Monte-Carlo Simulation
  - c) Queuing Theory

**SECTION-II**

- Q.6** A farmer has 100 acre farm. He can sell all tomatoes, lettuce or radishes he can raise. The price he can obtain is Re. 1 per kg for tomatoes, Rs. 0.75 a head for lettuce and Rs. 2 per kg for radishes. The average yield per- acre is 2000kg of tomatoes, 3000 heads of lettuce and 1000kgs of radishes. Fertilizer is available at Rs. 0.50 per kg and the amount required per acre is 100 kgs each for tomatoes and lettuce, and 50 kgs for radishes. Labour required for sowing, cultivating and harvesting per acre is 5 man-days for tomatoes and radishes, and 6 man-days for lettuce. A total of 400 man-days of labour are available at Rs. 20 per man-day. Formulate this problem as a Linear Programming model to maximize the farmer's total profit. **(15)**
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**Q.7** A TV repairman finds that the time spent on his job has an exponential (15) distribution with mean 30 minutes. If he repairs sets in the order in which they come and if the arrival of sets is approximately Poisson with an average rate of 10 per 8 hour day, what is his expected idle time each day? How many jobs are ahead of the set just brought in?

**Q.8** In a management institute, the first lecture starts at 10a.m. Following is the (15) probability distribution regarding number of students who are late comers for the first lecture each day.

<b>No. of Students coming late</b>	3	6	9	12	15	18
<b>Probability</b>	0.40	0.30	0.20	0.05	0.03	0.02

Simulate the system for 15 days and find average number of late comers per (15) day.

Use following random numbers:

94, 22, 12, 64, 94, 60, 85, 01, 91, 44, 43, 47, 39, 38, 77.

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