



II Semester M.B.A. (Day) Degree Examination, June/July 2013
(2007-08 Scheme)
MANAGEMENT

Paper 2.6 : Quantitative Methods and Operation Research

Time : 3 Hours

Max. Marks : 75

- Instructions :* 1) Calculators are *allowed*.
2) Answer *all* the Sections.

SECTION – A

Answer **any six** sub questions, **each** question carries **two** marks. (6×2=12)

1. a) What is saddle point ?
- b) Mention any four models used in OR.
- c) What is LPP ?
- d) What is degeneracy ?
- e) What is prescriptive model ?
- f) Define inventory.
- g) What is prohibited assignment ?
- h) Distinguish between event and activity.

SECTION – B

Answer **any three** questions : (3×8=24)

2. Explain the concept, scope and tools of OR as applicable to business and industry.
3. Explain the EOQ model. What are its assumptions ? What are the practical limitations in using this formula ?
4. Six jobs have to be processed at three machines A, B and C in the order ACB the time taken by each job on each machine is indicated below. Each machine can process any one job at a time.

		Processing Time in Hours					
		J ₁	J ₂	J ₃	J ₄	J ₅	J ₆
Machine	Job						
	A	12	8	7	11	10	5
	B	7	10	9	6	10	5
C	3	4	2	5	1.5	4	

Determine the sequence so as to minimize the processing time.

P.T.O.



5. The quotations (Rs. in lakhs) received for 4 project from four contractors are :

Contractor	Project			
	A	B	C	D
I	7	5	9	10
II	3	7	5	8
III	7	4	8	9
IV	8	7	5	2

- If only one project is to be awarded to one contractor, find out the assignment of projects to contractors in order to minimise the total cost.
 - If due to certain reasons, it has been decided to award project B to contractor I. How will you assign the remaining projects to each of the remaining 3 contractors ? So that the total cost is minimum.
6. Gupta Bakery Amritsar keeps stock of a popular brand of cake. Daily demand based on past experience is as given below :

Experience indicates :

Daily Demand :	0	15	25	35	45	50
Probability :	0.01	0.15	0.20	0.50	0.12	0.02

Consider the following sequence of random numbers :

R. No. 48, 78, 09, 51, 56, 77, 15, 14, 68, 09

Using the sequence, simulate the demand for the next 10 days.

SECTION – C

Answer **any two** questions, **each** question carries **twelve** marks. (2x12=24)

- Explain the situations which make the replacement of items necessary.
 - Write short note on :
 - Optimal solution
 - Critical path
 - Pure and mixed strategies.



8. Solve the following problem and test its optimality :

Plant	Project			Plant Availability
	A	B	C	
W	4	8	8	56
X	16	24	16	82
Y	8	16	24	77
Project Requirement	72	92	41	

9. A company produces 3 types of product X, Y and Z where use three raw materials R_1 , R_2 and R_3 . The following information is available :

Material	Requirement to produce 1 ton			Max. quantity available
	X	Y	Z	
R_1	3	0	3	22
R_2	1	2	3	14
R_3	3	2	0	14
Project per ton	1000	4000	5000	

Company wants to maximize profit. Formulate this as a LPP and solve it under simple method.



SECTION – D

10. Case study (Compulsory) :

(1×15=15)

The activities involved in a PERT project are detailed below :

Activity	Duration (in weeks)		
	a	m	b
1 - 2	3	6	15
2 - 3	6	12	30
3 - 5	5	11	17
7 - 8	4	19	28
5 - 8	1	4	7
6 - 7	3	9	27
4 - 5	3	6	15
1 - 6	2	5	14
2 - 4	2	5	8

- i) Draw a network diagram.
- ii) Find the critical path.
- iii) Find the probability of completing the project before 31 weeks.
- iv) What is the chance of project duration exceeding 46 weeks ?