

University of Pune
Department of Management Sciences
MBA-BT Semester II
Semester End Exams April 2011
206-Simulation and Optimization

Question Paper: 60marks.

Time: 3Hrs

Solve any three of Question No. 1 to 5.

Solve any two of Question No. 5 to 8

Q1 - Q5 carries 10 marks each. Q6 - Q9 carries 15 marks each

Q1) A company has decided to diversify its activities. The data collected by sales and production department is summarized below.

Potential demand exist for three products A, B & C. Market can take any amount of A and C where as the share of B for this organization is expected to be not more than 400 units a month. For every unit of C produced, there will be one unit of byproduct which sells at a contribution of Rs.3 a unit and only 100 units of this by product can be sold per month. Contribution per unit of products A, B & C is expected to be Rs. 6, Rs. 8 and Rs. 4 respectively.

These products require three different processes and the time required per unit product is given in the table below:

Process	Hours/unit			Available hours
	Product A	Product B	Product C	
I	2	3	1	900
II	-	1	2	600
III	3	2	2	1,200

Determine the optimum product mix for maximizing the contribution. Formulate LPP.

Q2) Solve the following game:

	B1	B2	B3	B4
A1	1	2	-1	2
A2	3	1	2	3
A3	-1	3	2	1
A4	-2	2	0	-3

Q3) A fleet owner finds from his past records that the cost per year of running a vehicle whose purchase price is Rs. 50,000 are as under:

Year	1	2	3	4	5	6	7
Running cost	5000	6000	7000	9000	11500	16000	18000
Resale value	30000	15000	7500	5750	2000	2000	2000

Thereafter running cost increase by Rs. 2000 per year but the resale value remains constant at Rs. 2000. At what age is the replacement due?

Q4) Give the role and significance of different optimization/ quantitative techniques in business and Industry for decision making.

Q5) Write short notes (any two)

- a. Hungarian method of assignment techniques
- b. Simulation
- c. Basic feasible solution

Q6) The owner of small grocery store wishes to evaluate his daily ordering policy for bread. His current rule is: order the amount demanded the previous day and he never runs out of stock. He purchases bread at the rate of Rs. 1.50 per bread and sells it for Rs. 1.75. The bread are ordered at the end of each day and are received the following morning. From historical data the following probability distribution of demand for any say has estimated:

Daily demand	10	20	30
Probability	0.25	0.50	0.25

The shop owner is considering the following two ordering policies:

Policy one:	Order the amount of bread that was demanded on the previous day
Policy two	Average of two days demands should be ordered each day

Simulate for ten days to determine the best policy for maximum profit. Use random numbers: 40,19,82,86,74,85,32,08,01,21

Q7) A project which is about to start consists of the activities listed below:

Activity	Immediate predecessor	Duration
A	None	4
B	A	12
C	A	5
D	C	11
E	C	3
F	D, E	4
G	None	3
H	A, G	5
I	G	4
J	H	15
K	H	2
L	J, K	3
M	F, L	3
N	B, M	3
O	L, M	5
P	O	3
Q	N, P	4

Draw a network to represent the project and determine the critical path.

Q8) Solve following transportation problem for minimization. Find the optimum solution.

From \ To	A	B	C	D	Demand
E	3	4	4	5	350
F	3	5	4	2	450
G	3	3	4	3	200
Supply	200	400	350	250	1200/1000

Q. 9) Write short notes

- a. Decision theory
- b. PERT