Q 9369

B.Sc. DEGREE EXAMINATION, MAY/JUNE 2006.

Sixth Semester

Apparel and Fashion Technology

BFT 364 — OPERATIONS RESEARCH

(Regulations – 2003)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List any two applications of the assignment model.

2. What is the purpose of introducing the gomory's fractional cut?

3. Define Slack.

4. What is meant by crashing an activity?

5. What is EBQ?

6. What is the need for safety stock?

7. State Kendall's notations as applied to queuing theory.

8. Define Monte-Carlo technique.

9. What is time value of money?

10. Define Zero sum game.

PART B — (5 × 16 = 80 marks)

11. (i) List the assumptions of a probabilistic demand inventory model. (4)

(ii) Find the optimum order quantity for a product for which the price breaks are as follows (12)

Quantity	Unit Cost (Rs.)
$0 <= q_1 < 100$	Rs. 20 per unit
$100 <= q_2 < 200$	Rs. 18 per unit
$200 <= q_3$	

The monthly demand for the product is 400 units. The storage cost is 20% of the unit cost of the product and the cost of ordering is Rs. 25.

12. (a) Minimize $Z = 3x_1 + 2x_2$

Subject to :

$$5x_1 + x_2 >= 10$$
$$x_1 + x_2 >= 6$$
$$x_1 + 4x_2 >= 12$$
$$x_1, x_2 >= 0.$$

Or

(b) Solve the following transportation problem, the cost matrix is shown below.

Source \ Destination	P	Q	R	S	Supply
A	21	16	25	13	11
B	17	18	14	23	13
C	32	17	18	41	19
Demand	6	10	12	15	43

13. (a) Five jobs must go through 3 machines in the order of ABC. Determine the sequence that will minimize the total lapsed time.

Job Number	1	2	3	4	5
Machine A	5	7	6	9	5
Machine B	2	1	4	5	3
Machine C	3	7	5	6	7

Or

(b) A small maintenance project consists of the following jobs whose precedence relation-ships is given below.

Job	1-2	1-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6	6-7
Duration Days	15	15	3	5	8	12	1	14	3	14

14. (a) On an average 96 patients per 24 hour day require the service of an emergency clinic. Also on an average a patient requires 10 minutes of active attention. Assume that the facility can handle only one emergency at a time. Suppose that it cost the clinic Rs. 100 per patient treated to obtain an average servicing time of 10 minutes and thus each minute of decrease in this average time would cost Rs. 10 per patient treated. How much would have to be budgeted by the clinic to decrease the average size of the queue from1.33 patients to 0.5 patients?

Or

(b) A manufacturing company keeps stock of a special product. Previous experience indicates the daily demand as given below.

Daily Demand	5	10	15	20	25	30
Probability	0.01	0.2	0.15	0.5	0.1[illegible]	0.02

Simulate the demand for the next ten days. Also determine the simulated average daily demand for the product.

15. (a) A stamping machine currently valued at Rs. 19,00 is expected to last 2 years and costs Rs. 4000 per year to operate. Another machine which can be purchased for Rs. 30,000 will last for 4 years and be operated at an annual cost of Rs. 3,000. If money carries the rate of interest at 10% per annum, determine which stamping machine should be purchased?

Or

(b) Solve the following game graphically.

	Player B			
Player A	1	3	–3	7
	2	5	4	–6