PG – 487

II Semester M.Com. Examination, June/July 2010
(2007-08 Scheme) (N.S.)
Commerce
Paper – 2.5 : OPERATIONS RESEARCH AND QUANTITATIVE TECHNIQUES

Time : 3 Hours Max. Marks : 80

SECTION – A

1. Answer **any ten** of the following in about **3-4** lines **each**. **Each** sub-question carries **two** marks : **(2×10=20)**

a) Define an OR model.

b) What is feasibility region ?

c) Define independent float.

d) What are ISO-Profit lines ?

e) Define Probability.

f) What is inventory cycle ?

g) What is expected value ?

h) What is Poisson distribution ?

i) State the rules for constructing project network.

j) What are forward pass and backward pass ?

k) What is Laplace principle in decision theory ?

l) What is Monte Carlo simulation ?

P.T.O.

SECTION – B

Answer **any three** of the following. **Each** question carries **5** marks. **(3×5=15)**

2. Write the procedure for Vogel's approximation method.

3. Briefly explain the major applications of linear programming in business.

4. What are the advantages and limitations of simulation ?

5. A factory follows an economic order quantity system for maintaining stocks of one of its component requirements. The annual demand is for 24,000 units, the cost of placing an order is Rs. 300, the component cost is Rs. 60 per unit. The factory has imputed 24% as the inventory carrying rate. Find the optimum interval for placing orders, assuming a year is equivalent to 360 days.

6. Solve the following transportation problem

Factory	Destination			Supply
	1	2	3	
A	8	4	10	10
B	9	7	9	80
C	6	5	8	15
Demand	75	20	50	

SECTION – C

Answer **any three** of the following. **Each** question carries **15** marks : **(3×15=45)**

7. Write a note on :

   a) Basic rules of Probability

   b) Risk analysis in capital budgeting

   c) Software packages for solving LPPs.

8. A company solicits bids on each of four projects from five contractors only one project may be assigned to any contractor. The bids received (in thousands of rupees) are given below. Contractor D feels unable to carry out project 3 and, therefore submits no bid.

Project	Contractor				
	A	B	C	D	E
1	18	25	22	26	25
2	26	29	26	27	24
3	28	31	30	–	31
4	26	28	27	26	29

i) Find the assignments with the smallest possible total cost.

ii) What is the minimum total achievable cost ?

9. Solve the following LPP :

Maximize $Z = 8x_1 - 4x_2$

Subject to $4x_1 + 5x_2 \leq 20$

$-x_1 + 3x_2 \geq -23$

$x_1 \geq 0$, x_2 unrestricted in sign.

10. The following table gives data on normal time and cost, and crash time and cost for a project.

Activity	Duration (weeks)		Total cost (Rs.)	
	Normal	Crash	Normal	Crash
1–2	3	2	300	450
2–3	3	3	75	75
2–4	5	3	200	300
2–5	4	4	120	120
3–4	4	1	100	190
4–6	3	2	90	130
5–6	3	1	60	110

i) Draw the network and find out the critical path and the normal project duration.

ii) Find out the total float associated with each activity.

iii) If the indirect costs are Rs. 100 per week, find out the optimum duration by crashing and the corresponding project costs.

11. The probability that there is at least one error in a statement of P&L account prepared by A is 0.3 and for B and C it is 0.25 and 0.35 respectively. A, B and C prepared 15, 20 and 25 statements independently. Find the expected number of correct statements.

Further all the three prepared 15 statements. A and B together prepared 20 statements; B and C together and C and A together prepared 25 and 30 statements respectively. Find the expected total number of correct statements.