

(4)

Total Pages - 04 (Four)

16/PG/PKC/IS/COM-103

2016

M. Com.

1st Semester Examination

QUANTITATIVE TECHNIQUES FOR MANAGERIAL DECISION

PAPER – COM – 103

Full Marks : 50

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

UNIT – I

1. Answer any two questions of the following: 5 X 2

- (a) Why is square evaluation of empty cells made in solving a transportation problem? If you commit a mistake in evaluating an empty cell in any of the iterations, can you ever reach the right optimal solution without detecting the mistake?
- (b) How would you test whether a feasible solution to a transportation problem is a Basic Feasible Solution? What would you do to solve a problem where the solution is not a Basic Feasible Solution?
- (c) What do you mean by Shadow Price? Obtain the dual of

$$\text{Minimize } Z = 16x_1 + 9x_2 + 21x_3$$

$$\text{Subject to } x_1 + x_2 + 3x_3 \geq 16$$

$$2x_1 + x_2 + x_3 \geq 12$$

$$\text{where } x_1, x_2, x_3 \geq 0$$

- (d) What do you mean by unbalanced transportation and assignment problems?

b) A project consists of seven activities as given below:

Activity	Optimistic Time (days)	Most likely Time (days)	Pessimistic time (days.)
1 – 2	1	1	7
1 – 3	1	4	7
1 – 4	2	4	8
2 – 5	1	1	1
3 – 5	2	5	14
4 – 6	2	5	8
5 – 6	3	6	15

You are require to-

- i) Draw the project network.
- ii) Determine the critical path.
- iii) State the expected project completion time.
- iv) Determine the probability that the project will be completed at least 3 weeks earlier than expected.

(Internal Assessment :10 marks)

(Turn Over)

(2)

UNIT – II

2. Answer any one questions of the following: 10 X 1

(a) A firm makes two types of furniture - chair and table. The contribution to project for each product as calculated by the accounting department is Rs.20 per chair and Rs. 30 per table. Both products are to be processed on three machines M1, M2, M3. The time required on hours by each product and total time available in hours per week on each machine is as follows:

Machine	Chair	Table	Time(Hrs.)
M1	3	3	36
M2	5	2	50
M3	2	6	60

Give mathematical formulation of LPP and solve the problem using simplex method. 2+8

b)

Factory	Capacity(units)	Ware house	Demand (units)
A	45	I	36
B	15	II	50
C	40	III	60

The transportation cost per unit (Rs.) allocated with each routes are

TO \ FROM	I	II	III
A	10	7	8
B	15	12	9
C	7	8	12

Find the optimum transportation schedule and the minimum cost.

8+2

3. Answer any two questions of the following: 5 X 2

- a) What are the components of Ordering Cost and Carrying Cost in relation to Inventory problem and how do they behave? 3+2
- b) What do you understand by the terms Direct Cost and Indirect Cost in PERT? How do they behave in project cost? 3+2
- c) State the reasons for carrying inventories.
- d) A company uses annually 50,000 units of an item of Rs.1.20 each. Inventory carrying cost is 15% of the annual average inventory value. Each order cost is Rs 45. If the company operates 250 days in a year and the procurement time is 10 days, safety stock is 500 units, then find out the EOQ, Re-order level, Maximum level and Minimum level. 2+1+1+1

4. Answer any one questions of the following: 10 X 1

- a) Worker come to a tool store room to enquire about the special tools for a particular job. The average time between the arrivals is 60 seconds and arrivals are assume to be in Poisson Distribution. The average service time is 40 seconds. Then determine the average queue length, average length of non-empty queue, average number of workers in the system including the workers being attended, mean waiting time of an arrival and average waiting time of an arrival of workers who wait.

(Turn Over) (3)

