Total Pages - 03 (Three)

2017

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) What do you mean by unbalanced assignment problem and prohibited assignment problem? 2.5 X 2
- (b) Write down the different methods for finding initial basic feasible solutions in TP. Discuss any one with an example. 2+3

(c) Solve graphically

Max.	$Z=7x_1+10x_2$
Subject to	$x_1 + x_2 \leq 30000, x_2 \leq 12000, x_1 \geq 6000$
	$x_1 > x_2$ where $x_1, x_2 > 0$

(d) What do you mean by degeneracy and artificial variable in LPP?

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

(a) A factory manufactures three products which are processed in three different production stages. The time required to manufacture one unit of each of the product and the daily capacities are given below :

(Turn Over)

(2)

Stages	P1	P2	P3	Capacity (Minutes)
1	1	2	1	430
2	3	-	2	460
3	1	4	-	420
Profit per	3	2	5	
Unit (Rs.)				

Set the data in a simplex table and find the table for optimal solution. 3+7

b) An airline that operate 7 days in a week has a time as per below. The Crew must have a minimum layover of 6 hours between two flights. Obtain the pairing flights that minimizes layover time away from home for any given pairing the Crew will be based at the City that results in the smaller layover

Flight No.	Delhi	Kolkata	Flight No.	Kolkata	Delhi
	(Depart)	(Arrival)		(Depart)	(Arrival)
1	7 a.m.	9 a.m.	1	9 a.m.	11 a.m.
2	9 a.m.	11 a.m.	2	10 a.m.	12 Noon
3	1.30 p.m.	3.30 p.m.	3	3.30 p.m.	5.30 p.m.
4	7.30 p.m.	9.30 p.m.	4	8 p.m.	10 p.m.

For each pair also mention the town where the Crew should be based. $10\,$

UNIT – II

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

- a) What do you mean by Network Analysis? State the application of the Network Analysis
 2+3
- b) Distinguish between Project Direct Cost and Indirect Cost in Inventory Management also discuss the Forward Pass and Backward Pass in Network Analysis.
 2.5 X 2
- c) Distinguish between PERT & CPM.

d) It is given that in a counter, the mean arrival rate is 18 P/Hr and the mean service rate is 23 P/Hr. Calculate the average time a customer will wait in a system and average number of customer waiting in the queue.

(Turn Over)

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

a) Define the carrying cost and find the optimal order quantity for a product for which the price breaks are as follows

Quantity	Unit Cost (Rs.)
Less than 50	10
More than 50 Less than 100	9
Less than equals to 100	8

The yearly demand is 200 Units, the storage cost is 25% and the ordering cost Rs. 20 per order. 3+7

b) The monthly maintenance work in a machine shop consists of 10 steps A to J. The inter relationship between them are identified by the event members:

Steps	Event No.	Time (days)
А	1-2	3
В	2-3	5
С	2-4	8
D	3-5	4
E	3-6	2
F	4-6	9
G	4-7	3
Н	5-8	12
Ι	6-8	10
J	7-8	6

You are to calculate -

- i) Draw a network and identify the critical path;
- ii) Complete early and late start and finish time;
- iii) How much slack does activity 3- 5, 4- 6, 7- 8 have;
- iv) If activity (2-3) takes 8 days instead of 5 days, what would be the project completion time;
- v) Identify the activities that have a free slack.

2 X 5

(Internal Assessment :10 marks)