

M.Com. Semester-II Examination, 2020
Subject: Commerce
Paper: COM 202
(Operations Research)

Time: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words
as far as possible

Module 1

Answer any two questions.

10 X 2 =20

1. Solve the following linear programming problem using simplex method:

$$\text{Maximise } Z = 2x_1 + 4x_2$$

$$\text{Subject to } 2x_1 + x_2 \leq 18$$

$$3x_1 + 2x_2 \geq 30$$

$$x_1 + 2x_2 = 26$$

$$(x_1, x_2) \geq 0$$

10

2. (a) Write down the mathematical formulation of the transportation problem.
(b) Obtain an initial basic feasible solution by applying VAM to the following transportation problem:

Factory	Warehouse				Factory capacity
	W1	W2	W3	W4	
F1	6	4	1	5	14
F2	8	9	2	7	16
F3	4	3	6	2	5
Warehouse requirement	6	10	15	4	

5+5

3. (a) Present a layout of the assignment table.
(b) “Hungarian Assignment Method operates on a principle of matrix reduction” Explain the statement with a simple illustration.

5+5

Module 2

Answer any two questions.

10 X 2 =20

4. Starting from the three axioms derive the poisson process for arrival in a queueing system. 10

5. (a) Give a brief account of the methodology of the replacement problem.
(b) “Optimal group replacement interval is determined by the lowest point on the AC of the replacement curve” Explain the statement with a suitable diagram. 5+5

6. A television is manufactured in six steps, labelled A through F. Because of its size and complexity, the television is produced one at a time. The production control manager thinks that network scheduling techniques might be useful in planning future production. He records the following information:

A is the first step and precedes B and C
C precedes D and E
B follows D and precedes E
F follows E
D is the successor of F.

- (a) Draw an activity-on-node diagram for the production manager
- (b) On checking with the records, the production manager corrects his last node to read, “D is a predecessor of F”. Draw a new diagram for the revised project.
- (c) After pondering the network and rechecking from the records, it is found that B was really a predecessor of D rather than vice versa. Draw a revised network incorporating this new change.
- (d) Draw an activity-on-arrow diagram representing the network in part (c). How many dummy activities did you use in your network? 10

Note: Use the mail id: com405f@gmail.com to send your answer scripts.