

(040830202)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2017

THIRD SEMESTER

Branch - Computer Science

Paper II — OPERATIONS RESEARCH

Time : 3 Hours

Max. Marks : 70

PART - A

Answer any FIVE of the following.

(Marks : 5 × 4 marks = 20 marks)

1. Write the procedure for Graphical method in Linear programming problem.
2. Write the procedure for Dual Simplex method.
3. Write the procedure for determining the optimal sequence for 2 jobs k machines.
4. Define the terms :
 - (a) The arrival rate, λ
 - (b) Time in the system (T_q).
5. Explain about the forward pass procedure in critical path calculations.
6. List any five common types and applications and simulation.
7. What is a saddle point in Game theory? Explain its significance in solving the game problems.
8. Write the difference between CPM and PERT.

PART - B

Answer ONE question from each Unit.

(Marks : 4 × 12.5 marks = 50 marks)

UNIT - I

9. Find solution to the following LPP using simplex method :

$$\text{Max : } Z = x_1 - x_2 + x_3$$

$$\text{Subject to the constraints : } x_1 + x_2 + x_3 \leq 10$$

$$2x_1 - x_3 \leq 2$$

$$2x_1 - 2x_2 + 3x_3 \leq 0$$

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

Or

[P.T.O]

10. What is transportation problem? Find the optional solution of the following transportation problem.

	A	B	C	D	E	Supply
P	5	8	6	6	3	800
Q	4	7	7	6	6	500
R	8	4	6	6	3	900
Demand	400	400	500	800	100	

UNIT - II

11. (a) Explain procedure and Hungarian method in assignment problem.
 (b) Define unbalanced assignment problem. Give an example.

Or

12. (a) Explain the graphical method to solve $2 \times n$ or $m \times 2$ games.
 (b) Solve the following game using dominance property.

		Player B			
		I	II	III	IV
Player A	I	3	2	4	0
	II	3	4	2	4
	III	4	2	4	0
	IV	0	4	0	8

UNIT - III

13. Find the sequence of jobs that minimize the total elapsed time (in Hrs) to complete the following 6 jobs on 2 machines.

		Jobs					
		1	2	3	4	5	6
Machines	M_1	9	4	11	13	9	12
	M_2	2	10	8	11	11	10

Or

14. The mean arrival rate to service centre is 3 per hour. The mean service time is found to be 10 minutes per services. Assume Poisson arrival and exponential service time. Find
- The utilization factor for this service facility
 - The probability of two units in the system
 - The expected number of units in the system
 - The expected time in minutes that a customer has to spend in the system

UNIT - IV

15. Explain about :

- (a) Kuhn-Kucker condition
- (b) Quadratic programming.

Or

16. Construct the network for the following :

Activity	Duration
1-2	4
1-3	1
2-4	1
3-4	1
3-5	6
4-9	5
5-6	4
5-7	8
1-8	1
7-8	2
8-10	5
9-10	7

All the duration are given is days :

- (a) Find the critical path and its length
- (b) Compute the floats of the activities
- (c) Compute early start, early finish of the activities.