

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



B.A.DEGREE EXAMINATION –ECONOMICS

FOURTH SEMESTER – APRIL 2018

16UEC4ES01– OPERATIONS RESEARCH

Date: 23-04-2018

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

PART-A

Answers any FIVE questions in about 75 words each

(5 x 4 = 20 Marks)

1. Point out the various methods of transportation problem.
2. What are the different forms of inventory?
3. List out the uses of operations research.
4. Distinguish between PERT and CPM.
5. Define basic feasible solution in a Linear Programming Problem.
6. Write a short note on Economic Order Quantity (EOQ).
7. State the role of slack variables and surplus variables in a Linear Programming Problem.

PART-B

Answer any FOUR questions in about 250 words each

(4 x 10 = 40 marks)

8. Briefly explain the costs involved in inventory problems.
9. Analyse the role of operations Research in Business and management and engineering.
10. Explain the steps involved in the Hungarian method used for solving assignment problems.
11. Solve the transportation model using NWCM

	D	E	F	G	Available
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Requirements	200	225	275	250	

12. A company produces refrigerators in unit I and heaters in unit II. The two products are produced. The weekly production cannot exceed 25 in unit I and 36 in unit II, Due to constraints two workers are employed. A refrigerator requires 2 men-week of labour, while a heater requires 1 man-week of labour. The profit available is Rs.600 per refrigerator and Rs.400 per heater. Formulate the LPP problem.

13. The assignment cost of assigning any one operator to any one machine is given in the following table:

		Operators			
		I	II	III	IV
Machines	A	10	5	13	15
	B	3	9	18	3
	C	10	7	3	2
	D	5	11	9	7

Find the optimal assignment by Hungarian method.

14. The annual demand for a product is 1,00,000 units. The rate of production is 2,00,000 units per year. The set-up cost per production run is Rs. 5000, and the variable production cost of each item is Rs. 10. The annual holding cost per unit is 20% of the value of the unit. Find the optimum production lot-size, and the length of the production run.

PART-C

Answer any TWO questions in about 900 words each

(2 x 20 = 40 marks)

15. Solve the assignment problem for maximization given the profit matrix (profit in Rs)

		Machines			
		p	Q	R	S
Jobs	A	51	53	54	50
	B	47	50	48	50
	c	49	50	60	61
	D	63	64	60	60

16. Find the sequence that minimizes the total elapsed time required to complete the following tasks

Task	A	B	C	D	E	F	G
Machine 1	3	8	7	4	9	8	7
Machine 2	4	3	2	5	1	4	3
Machine 3	6	7	5	11	5	6	12

17. Analyse the rules for constructing node and network computations.

18. Solve the transportation problem by Vogel's Approximation method.

Destination

		A	B	C	D	SUPPLY
Source	1	11	20	7	8	50
	2	21	16	20	12	40
	3	8	12	18	9	70
	DEMAND	30	25	35	40	
