



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.A.DEGREE EXAMINATION – ECONOMICS

THIRD SEMESTER – APRIL 2018

ST 3103/ST 3100 - RESOURCE MANAGEMENT TECHNIQUES

Date: 05-05-2018
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

SECTION A

(10 X 2 = 20 Marks)

Answer ALL questions.

1. State the objectives of operations research.
2. What are the phases of operation research?
3. State any two limitations of Linear Programming problem.
4. Write short note on feasible solution.
5. What is balanced and unbalanced transportation problem?
6. Write any two applications of Assignment Problem.
7. What is network analysis?
8. What is the objective of a sequencing problem?
9. Define total float.
10. Explain float in network analysis.

SECTION B

(5 X 8 = 40 Marks)

Answer any FIVE questions.

11. What are the different types of models in operation research?

12. State and explain the basic assumptions of linear programming.

13. Use the graphical method to solve the following LPP.

$$\text{Maximize } Z = 6x + 4y$$

Subject to constraints,

$$2x + y \leq 390$$

$$3x + 3y \leq 810$$

$$y \leq 200$$

$$x, y \geq 0$$

14. Write down the steps of the Hungarian method for assignment problem.

15. Explain the method of obtaining an initial solution to transportation problem by column minimum method

16. Differentiate between CPM and PERT.

17. Draw the network and determine the critical path for the following data:

Job	1-2	1-3	2-3	2-4	3-4	4-5
Duration(in days)	20	25	10	12	6	10

18. Explain the concept of sequencing problem.

SECTION C

(2 X 20 = 40 Marks)

Answer any TWO questions

19. Solve the following L.P. problem by simplex method.

$$\begin{aligned} \text{Maximize } Z &= 500x_1 + 600x_2 + 1200x_3 \\ \text{Subject to constraints,} \\ 2x_1 + 4x_2 + 6x_3 &\leq 160 \\ 3x_1 + 2x_2 + 4x_3 &\leq 120 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

20. A company has 5 machines to be assigned to 5 workers. The time to complete the work on different machines is given below

		WORKERS				
		W1	W2	W3	W4	W5
MACHINE	I	40	40	35	25	50
	II	42	30	6	25	27
	III	50	48	40	60	50
	IV	20	19	20	18	25
	V	58	60	59	55	53

Suggest optimal assignment of workers to machine.

21. Obtain the initial basic feasible solution of the transportation problem by using (a) North West Corner Method (b) Least Cost Method (LCM) (c) Vogel's Approximation method (VAM)

	A	B	C	D	Availability
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

(6+6+8)

22. A project has the following characteristics and time estimates: optimistic time (a), most likely time (m), pessimistic time (b). Construct a PERT network find the critical path and determine the project completion time and its variance.

Activity	1-2	7-8	2-3	3-5	5-8	6-7	4-5	2-4	1-6
a	3	4	6	5	1	3	3	2	2
b	6	19	12	11	4	9	6	5	5
m	15	28	30	17	7	27	15	8	14

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