



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.A. DEGREE EXAMINATION – ECONOMICS

THIRD SEMESTER – NOVEMBER 2017

ST 3103 - RESOURCE MANAGEMENT TECHNIQUES

Date: 09-11-2017
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. State the scope of transportation model.
5. What is balanced and unbalanced transportation problem?
6. Describe an assignment problem
7. Explain float in network analysis.
8. What is critical event?
9. What are the factors influencing the inventory models?
10. Explain total inventory cost.

SECTION B

(5 X 8 = 40 Marks)

Answer any FIVE questions

11. Explain the scope of operation research in business activities.

12. Use the graphical method to solve the following L.P problem.

$$\begin{aligned} \text{Minimize } Z &= 3X_1 + 2X_2 \\ \text{Subject to constraints,} \\ 5x_1 + X_2 &\leq 10 \\ x_1 + X_2 &\leq 6 \\ x_1 + 4X_2 &\leq 12 \\ X_1, X_2 &\geq 0 \end{aligned}$$

13. Find the initial basic feasible solution using North West Corner method(NWCM).for the following Transportation problem:

	D1	D2	D3	D4	D5	Availability
A1	20	28	32	55	70	50
A2	48	36	40	44	25	100
A3	35	55	22	45	48	150
Demand	100	70	50	40	40	

14. A project has the following characteristic. Draw the network and determine the critical path and project completion time

Job	1 – 2	1 -3	2 -4	3 – 4	3 – 5	4 – 9	5 – 6	5 – 7	6 – 8	7 – 8	8 – 10	9 -10
Duration(in days)	4	1	1	1	6	5	4	8	1	2	5	7

15. Six jobs go first over machine I and then over machine II. The order of completion of jobs has no significance. The following table gives machine time for the six jobs and the two machine:

Time (in hours)

Job	1	2	3	4	5	6
Machine I	5	9	4	7	8	6
Machine II	7	4	8	3	9	5

Find the sequence of the job that minimized the total elapsed time to complete the jobs. Also work out the total elapsed time for an optimal sequence. What is the total idle time on machine I and on machine II?

16. Distinguish between CPM and PERT.

17. Draw a network diagram for the following data.

Activity	A	B	C	D	E	F	G	H	I	J
Preceding activity	None	A	A	B	A	B,E	C	D,E	G	H,I

18. Write any four steps which are involved in developing an inventory model.

SECTION C

(2 X 20 = 40 Marks)

Answer any TWO questions

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

$$\text{Maximize } Z = 6x_1 + 4x_2$$

Subject to constraints,

$$2x_1 + x_2 \leq 390$$

$$3x_1 + 3x_2 \leq 810$$

$$x_2 \leq 200$$

$$x_1, x_2 \geq 0$$

20. Obtain the initial basic feasible solution of the transportation problem by using (a) Least Cost method (LCM) (b) 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	

21. A company has 4 machines to be assigned to 4 of the 5 workers available for this purpose. The expected production from each machine operated by each worker is given below.

WORKERS

MACHINE	W1	W2	W3	W4	W5
I	40	46	48	36	48
II	48	32	36	29	44
III	49	36	41	38	45
IV	30	46	49	44	47

Suggest optimal assignment of workers to machine.

22. A project has the following characteristics and time estimate – 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