35151

M.Sc. DEGREE EXAMINATION, NOVEMBER 2017.

THIRD SEMESTER

Statistics

Paper I — OPERATIONS RESEARCH – I

Time : Three hours Maximum : 75 marks

(No additional sheet will be supplied)

PART A — (5 × 3 = 15 marks)

Answer any FIVE questions.

Each question carries 3 marks.

Each answer should not exceed 1 page.

1. Explain the significance and scope of operations research.
2. Explain the procedure of MODI method for Optimality test.
3. Explain the Johnson and Bellman method of determining optimal sequence in case of n jobs on two machines.
4. Explain the problem of sequencing with principle assumptions.
5. What is meant by Economic Order Quality (EOQ) and give the EOQ formula for without shortage model.
6. Explain (a) lead time (b) re-order point (c) buffer stock
7. Explain the customers behaviors in Queuing system.
8. Explain M/M/C model.

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PART B — (4 × 15 = 60 marks)

Answer ALL questions.

Each question carries 15 marks.

Each answer should not exceed 6 pages.

9. Solve the following LPP by simplex method

Minimize $Z = 4x_1 + x_2$

Subject to constraints $3x_1 + x_2 = 2$

$4x_1 + 3x_2 \geq 6$

$x_1 + 2x_2 \leq 4$

$x_1, x_2 \geq 0.$

Or

10. Solve the following TPP whose cost matrix is given below :

		Destination				
		A	B	C	D	Capacity
	1	1	5	3	3	34
	2	3	3	1	2	15
	3	0	2	2	3	12
	4	2	7	2	4	19
Origin	Demand	21	25	17	17	80

(a) Obtain the I.B.F solution by VAM.

(b) Obtain the optimal solution.

(c) Obtain the optimal shipping cost.

11. Explain the problem of assigning n jobs to three machines with your own example.

Or

12. Find the sequence for the following eight jobs that will minimize the total elapsed time for the completion of all the jobs. Each job is processed in the same order.

	Jobs							
Time for machines	1	2	3	4	5	6	7	8
A	4	6	7	4	5	3	6	2
B	8	10	7	8	11	8	9	13
C	5	6	2	3	4	9	15	11

13. Derive the formula for EOQ when production is instantaneous and demand is uniform.

Or

14. What are phases in service? Derive the results for M/G/1 system.

15. Derive the (S-s) inventory policy in the case of exponential demand.

Or

16. Derive the Pollazeck-Khinchine formula in M/E$_K$/1 queueing model.

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