R18 Regulation | Subject code:2P7CH

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VII Semester Supplementary Examinations, May 2025

OPERATIONS RESEARCH

(ME)

Maximum Marks: 75 | Date: 29.05.2025 | Duration: 3 hours

Notes: 1. This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks 10X2M=20 Marks

		Marks	CO	BTL
1	Explain basics of operations research.	2M	1	L1
2	Give the limitations of graphical method of solving LPP.	2M	1	L1
3	Explain the use of vogel's approximation method?	2M	2	L1
4	Define saddle point game.	2M	2	L1
5	Give the advantages of sequencing in a flow shop manufacturing.	2M	3	L1
6	What is meant by inventory control?	2M	3	L1
7	State the rule of dominance.	2M	4	L1
8	What are types of inventories?	2M	4	L1
9	What is meant by Monte Carlo simulation?	2M	5	L1
10	What is waiting time in queue theory ?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)

		Marks	CO	BTL
11	Solve the following Linear programming problem by Big-M method ?	10M	1	L2

Maximize $Z=X_1+2X_2+3X_3-X_4$
and subject to constraints
$X_1+2X_2+3X_3=15$,
$2X_1+X_2+5X_3=20$,
$X_1+2X_2+X_3+X_4=10$ and
$X_1, X_2, X_3, X_4 \geq 0$.

OR

12	Explain the graphical method of solving a linear programming problem with an example.	10M	1	L2
13	Find the optimum solution to the transportation problem given in the table for which the cost ,origin -availabilities, and destination -requirement are given.	10M	2	L2

	D1	D2	D3	D4	Supply
O1	5	3	6	2	19
O2	4	7	9	1	37
O3	3	4	7	5	34
Demand	16	18	31	25	90

OR

14	Solve the following travelling salesman problem. ∞ 3 6 2 3 3 ∞ 5 2 3 6 5 ∞ 6 4 2 2 6 ∞ 6 3 3 4 6 ∞	10M	2	L2
15	Machine A costs Rs 9000. Annual operating cost is Rs 200 for the first year and then increase by Rs 2000 every year. Determine the year of replacement and average total cost that year. Machine B costs Rs 10000. Annual operating cost is Rs 400 for the first year and then increase by Rs 800 every year. You have a machine A, which is one year old. Should you replace it with B? If so, when?	10M	3	L2
	OR			
16	Six jobs go first over Machine-1 and then over Machine-II The orders of completion of jobs have no significance. The following gives the machine times in hours for six jobs and the two machines. Find the Optimal total time and the idle times of the machine. (10M) Job 1 2 3 4 5 6 Machine I 5 9 4 7 8 6 Machine II 7 4 8 3 9 5	10M	3	L2
17	solve the following game using dominance principle Player B: 1 2 3 4 Player A: I 19 6 7 5 II 7 3 14 6 III 12 8 18 4 IV 8 7 13 -1	10M	4	L2
	OR			
18	The demand for an item is 6000 units per its production rate is 1000 units per month carrying cost is Rs 50 year and set up is Rs 2000 set up . The shortage cost is Rs 1000 per unit per year. Find various parameters the inventory system .	10M	4	L2
19	Discuss the concept of dynamic programing with an example.	10M	5	L2
	OR			
20	Explain the types of simulation models.	10M	5	L2