O.P.Code: 20ME0336 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. IV Year I Semester Regular & Supplementary Examinations October/November-2025
OPERATION RESEARCH
(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

1 Solve the following by using Big-M method. Maximize $Z=2X_1+3X_2+4X_3$, Subjected to $3X_1+X_2+4X_3< 600$, $2X_1+4X_2+2X_3> 480$, $2X_1+3X_2+3X_3= 540$ and $X_1,X_2,X_3> 0$. CO1 L3 12M

OR

2 a Discuss the applications of Operations Research. CO1 L2 6M
b Discuss the types of operation Research models. CO1 L2 6M

UNIT-II

3 Determine the basic Feasible solution to the following Transportation problem using NWC, VCM and VAM? CO2 L5 12M

	A	B	C	D	E	SUPPLY
P	2	11	10	3	7	4
Q	1	4	7	2	1	8
R	3	9	4	8	12	9
DEMAND	3	3	4	5	6	

OR

4 a What is Transportation Problem? CO2 L1 6M
b What is travelling salesman problem? CO2 L1 6M

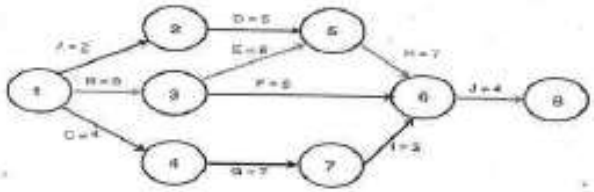
UNIT-III

5 Solve the following GAME, using the Dominance Principle. CO3 L3 12M

		Firm B			
Firm A	4	6	5	10	6
	7	8	5	9	10
	8	9	11	10	9
	6	4	10	6	4

OR

6 a State briefly the applications of queuing models. CO3 L1 6M
b What is game theory? What are the various types of games? CO3 L1 6M



OR

8 a Explain the Forward Pass computations for Earliest Event Time in detail. CO4 L2 6M
b Explain the following CO4 L2 6M
i) critical event ii) critical activity iii) Total float iv) Free float

UNIT-V

9 Assume that present value of one rupee to be spent in a years' time is Re.0.90 and C=Rs 6000, Capital cost of equipment .Running costs are given in the table below. When should the machine be replaced? CO5 L5 12M

Year (n)	1	2	3	4	5	6	7
Running cost (MC) in Rs.	1000	1200	1600	2000	2600	3200	4000

OR

10 a What are the sequential steps involved in sequencing jobs? CO5 L1 6M
b Explain the Bellman's principle of optimality. CO5 L2 6M

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