19/5/26 FN

O.P.Code: 25MB9013 | R25 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
MBA I Year II Semester Regular Examinations May-2026
OPERATIONS RESEARCH

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

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

UNIT-I

1 a Define Operations Research. Discus the scope of Operations Research. CO1 L1 6M
b Define the following: CO1 L1 6M
(i) Basic variable (ii)Artificial variable (iii) Slack variable

OR

2 Solve the following LP problem using **Simplex method.** CO1 L3 12M
Maximize $Z = X1 + X2 + 3X3$
Subject to constraints $3X1 + 2X2 + X3 \leq 3$,
$2X1 + X2 + 2X3 \leq 2$, $X1$ and $X2 \geq 0$.

UNIT-II

3 a What are the types of Transportation Problem? Explain them with suitable examples CO2 L1 6M
b Determine an initial basic feasible solution to the following transportation problem using **Northwest corner cell method.** CO2 L4 6M

Destination

Source	1	2	3	4	Supply
1	3	1	7	4	300
2	2	6	5	9	400
3	8	3	3	2	500
Demand	250	350	400	200	

OR

4 a Discuss the steps of Hungarian method to solve the assignment problem. CO2 L2 6M
b Solve the following Assignment Problem. CO2 L4 6M

Operator

Job	1	2	3	4	5
A	10	12	15	12	8
B	7	16	14	14	11
C	13	14	7	9	9
D	12	10	11	13	10

UNIT-III

5 a Explain various steps involved in the problems with *n* jobs through 2 machines. CO3 L2 6M

b Solve the following sequencing problem using the Johnsons algorithm method and find out: CO3 L4 6M
(I) Total run time/ Elapse time
(II) Total idle time

Jobs	Machine1	Machine 2
A	4	2
B	3	9
C	5	1
D	7	3
E	8	5

OR

6 There are 9 jobs each of which has to go through the machine A and B in the order AB. Processing times in hours are given as CO3 L4 12M

Jobs	1	2	3	4	5	6	7	8	9
M1	5	3	12	15	6	10	11	9	5
M2	6	8	10	10	6	12	1	3	7

Calculate the total Elapsed time and also Idle time.

UNIT-IV

7 a Define the following terminologies of game theory. CO4 L2 6M
(i) Players (ii) Strategy (iii) Saddle point (iv) Value of the game
(v) Two-person zero-sum game (vi) Dominance property
b Throw some light on the significance of game theory for managers in a business organization. Solve the following 2 person zero sum game with the following 3x2 payoff matrix of player A. CO4 L4 6M

		Player B	
		B1	B2
Player A	A1	9	2
	A2	8	6
	A3	6	4

OR

8 a Discuss the steps involving in game with mixed strategies. CO4 L2 6M
b Discuss the algorithm for M × 2 game in Graphical Method. CO4 6M

UNIT-V

9 a Write the guidelines/rules for network construction. CO5 L1 6M
b Draw the network and determine the critical path for the following data. CO5 L4 6M

Activity	1-2	1-3	2-3	2-4	3-4	3-5	4-5	4-6	5-6
Time(Days)	12	11	5	21	18	8	14	23	17

OR

10 a Explain the three time estimates used in PERT. CO5 L2 6M
b Distinguish between CPM and PERT. CO5 L4 6M

*** END ***