Q.P. Code: 16ME324 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations Nov/Dec 2019

OPERATIONS RESEARCH

(ME)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1 **a** Solve the following LPP using simplex method maximize $Z=5X_1+4X_2$ subject to constraints

$6X_1+4X_2 \leq 24$

$X_1+2X_2 \leq 6$ 10M

$-X_1+X_2 \leq 1$

$X_2 \leq 2$

$X_1, X_2 \geq 0$

b Define operations research. 2M

OR

2 Solve the following LPP using Big-M method Minimize $Z=2X_1+X_2$ Subject to constraints

$3X_1+X_2= 3$

$4X_1+3X_2 \geq 8$ 12M

$X_1+X_2 \leq 3$

and $X_1, X_2 \geq 0$

UNIT-II

3 Determine the basic Feasible solution to the following Transportation problem using VAM and find the optimality

	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	

12M

OR

4 There are three parties who supply the following quantities of coal and three consumers who require the coal as follows

Party 1:	14 tons	consumer A :	6 tons
Party 2:	12 tons	consumer B :	10 tons
Party 3:	5 tons	consumer C :	15 tons

The cost Matrix is as shown below

	A	B	C
1	6	8	4
2	4	9	3
3	1	2	6

12M

UNIT-III

5 In a railway marshalling yard, goods trains arrive at a rate of 30 trains per day, Assuming that the inter-arrival time follows an exponential distribution and the service time distribution is also exponential with an average of 36 minutes. Calculate i).Expected queue size ii).Probability that the queue size exceeds 10. If the input of trains increases to an average of 33 per day what will be the change in (i) and (ii). 12M

OR

6 Solve the following game, using the Dominance Principle. 12M

		Firm B					
		B1	B2	B3	B4	B5	B6
FirmA	A1	4	2	0	2	1	1
	A2	4	3	1	3	2	2
	A3	4	3	7	-5	1	2
	A4	4	3	4	-1	2	2
	A5	4	3	3	-2	2	2

UNIT-IV

7 Find the sequence that minimizes the total elapsed time required to complete the following tasks on the machines in the order 1 – 2 – 3. Find also the minimum total elapsed time and the ideal times on the machines. 12M

		A	**B**	**C**	**D**	**E**	**F**	**G**
Tasks time on Machines	**1**	3	8	7	4	9	8	7
	2	4	3	2	5	1	4	3
	3	6	7	5	11	5	6	12

OR

8 A project has the following schedule. Construct PERT network and compute the total float for each activity. Find critical path with its duration 12M

Activity	Time in month	Activity	Time in month	Activity	Time in month
1-2	2	3-6	8	6-7	5
1-3	2	3-7	5	7-8	4
1-4	1	4-6	3	7-9	3
2-5	4	5-8	1		

UNIT-V

9 A manufacturer finds from his past records that cast per year associated with a machine with a purchase price of Rs 50,000/- are as given below. Determine the optimum policy 12M

Year (n)	1	2	3	4	5	6	7	8
Running cost (MC)in Rs.	15000	16000	18000	21000	25000	29000	34000	40000
Scrap value	35000	25000	17000	12000	10000	5000	4000	4000

OR

10 **a** What is dynamic programming? Explain the advantages and disadvantages of dynamic Programming. 6M

b State the Principle of optimality. 6M

*** END ***