Roll No. .....

OLE-24478

B. Tech. 7th Semester (ME) Examination – April, 2021

OPERATION RESEARCH

Paper : ME-405-F

Time : Three Hours] ***[Maximum Marks : 100***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. **1** is ***compulsory***. Student has to attempt ***one*** question from each Section.

1. (a) Discuss various phases is solving an O.R. problem.

(b) Write a note on sensitivity analysis in LPP.

(c) Discuss the various parameters for Queuing problem.

(d) Define float. Explain its different types and their importance.

(e) Write a short note on M/M/1 models and their applications. 20

SECTION – A

2. (a) Discuss applications and limitations of O. R. What are different models used in O.R. ? 20

(b) Solve the following LP Problem by Simplex Method :

Max. $Z = 4x_1 + 3x_2$

Subject to :

$x_1 + x_2 \leq 6$

$x_1 + 2x_2 \geq 4$

x_1 and $x_2 \geq 0$

3. Solve the following LP problem by BIG M method : 20

Minimize $Z = 3x_1 + x_2$

Subject to : $3x_1 + x_2 = 3$

$4x_1 + 3x_2 \geq 6$

$x_1 + 2x_2 \leq 3$

$x_1, x_2 \geq 0$

SECTION – B

4. Solve the following transportation problem where cell entries are unit costs : 20

	W_1	W_2	W_3	W_4	W_5	Available
F_1	68	35	4	74	15	18
F_2	57	88	91	3	8	17
F_3	91	60	75	45	60	19
F_4	52	53	24	7	82	13
F_5	51	18	82	13	7	15
Required	16	18	20	14	14	82

5. (a) Explain the primal dual relationships in LPP. Give the economic interpretation of dual variables. 10

(b) Discuss the use of sensitivity analysis for post optimal problems. 10

SECTION – C

6. Trains arrive at the yard every 15 minutes and the service time is 33 minutes. If the line capacity of the yard is limited to 4 trains, find (i) the probability that the yard is empty, (U) the average number of trains in the system. 20

7. (a) Define float. Explain its different types and their importance. 10

(b) Explain crashing of project networks. 10

SECTION – D

8. How can you use Monte-Carlo simultation for industrial problems ? Explain with suitable examples. 20

9. What is decision-making ? Explain and differentiate this under the conditions of certainty and uncertainty in detail. 20