6. What is the classification of simulation model? Explain the advantages and disadvantages of simulation technique.

7. Use Simplex method to solve:
   Maximize $Z = 3x1 + 2x2$
   Subject to $-x1 + 2x2 \leq 4$
   $3x1 + 2x2 \leq 14$
   $x1 - x2 \leq 3$
   $x1, x2 \geq 0$

8. Use the Hungarian method to solve the following assignment problem:

	J1	J2	J3	J4
M1	10	9	7	8
M2	5	8	7	7
M3	5	4	6	5
M4	2	3	4	5

*******END OF PAPER*******

2112M046

BACHELOR OF VOCATION
BPM & Analytics
Subject: Introduction to Operations Research
Subject Code: GBGE202
Semester: Third
December 2021
Theory (External): 70 Marks
Time: 03 Hours

Instructions to the Students

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 2 marks.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 10 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number

SECTION –A (OBJECTIVE TYPE QUESTIONS)
(10x2=20 Marks)

A. What is Operations Research? Explain feature of O.R.

B. Differentiate between pure and mixed strategy.

C. What is the difference between slack and surplus variables?

D. What is infeasible solution in LPP?

E. Explain simplex method of LPP?

F. Define degeneracy transportation problem.

G. What is simulation?

H. Explain Total float, independent float and free float.

I. Define PERT.

J. Explain decision tree with example?

SECTION –B (ESSAY TYPE QUESTIONS)
(5x10=50 Marks)

1. Define operation Research. Give the historical development of OR.

2. What are the situations when O.R. techniques will be applicable?

3. Write the steps involved in the North-West Corner Rule for finding an initial basic feasible solution to a transportation problem?

4. Consider the game having following payoff table. Determine the optimal strategy for each player.

Strategy		Player 2			
		1	**2**	**3**	**4**
Player 1	**1**	2	-3	-1	1
	2	-1	1	-2	2
	3	-1	2	-1	3

5. Draw the A project consists of seven activities for which the relevant data are given below:

Activity	Preceding activities	Duration (days)
A	----------	4
B	----------	7
C	----------	6
D	A, B	5
E	A, B	7
F	C, D, E	6
G	C, D, E	5

a) Draw the network.
b) Identify the critical path and find the project completion time.