

**BACHELOR OF BUSINESS ADMINISTRATION (C.B.C.S.) (2015 COURSE)**

**B.B.A. Sem-V :SUMMER- 2022**

**SUBJECT : INTRODUCTION TO OPERATION RESEARCH**

Day : Tuesday  
Date : 14-06-2022

**S-13882-2022**

Time : 10:00 AM-01:00 PM  
Max. Marks : 60

**N.B.:**

- 1) Attempt **ANY FOUR** questions from Section-I each question carries **15** marks.
- 2) Attempt **ANY TWO** questions from Section-II each question carries **20** marks.
- 3) Answers to both the sections should be written in **SAME** answer book.
- 4) Use of Non-Programmable **CALCULATOR** is allowed.

**SECTION-I**

- Q.1** What is Operations Research? Discuss its uses and limitations.
- Q.2** Use the graphical method to solve the following LP problem.  
*Minimize*  $Z = 20x_1 + 10x_2$   
Subject to the constraints  
 $x_1 + 2x_2 \leq 40$   
 $3x_1 + x_2 \geq 30$   
 $4x_1 + 3x_2 \geq 60$   
and  $x_1, x_2 \geq 0$
- Q.3** What is an Assignment Problem? Explain Hungarian method for solving an Assignment Problem.
- Q.4** "PERT takes care of uncertain durations". How far is this statement correct? Explain with reasons.
- Q.5** Write short notes (**ANY THREE**):  
a) Monte Carlo Simulation Technique  
b) CPM  
c) Applications of Assignment problem  
d) History of Operations Research

**SECTION-II**

- Q.6** Find optimal solution for the following Transportation problem.

	D1	D2	D3	D4	Supply
S <sub>1</sub>	19	30	50	10	7
S <sub>2</sub>	70	30	40	60	9
S <sub>3</sub>	40	8	70	20	18
Demand	5	8	7	14	34

- Q.7** Define Simulation. Why is Simulation used? Explain applications and limitations of Simulation Technique.
- Q.8** A department has five employees with five jobs to be performed. The time (in hours) taken by each employee to perform each job is given in the matrix below:

Jobs	Employees				
	I	II	III	IV	V
A	10	5	13	15	16
B	3	9	18	13	6
C	10	7	2	2	2
D	7	11	9	7	12
E	7	9	10	4	12

How should the jobs be allocated so as to minimize the total man-hours?

\* \* \* \* \*