

BACHELOR OF BUSINESS ADMINISTRATION (C.B.C.S.) (2015 COURSE)
B.B.A. Sem-V : WINTER : 2021
SUBJECT: INTRODUCTION TO OPERATION RESEARCH

Day : Tuesday
Date : 11-01-2022

W-13882-2021

Time : 10:00 AM-01:00 PM
Max. Marks: 100

N.B.:

- 1) Answer ANY FOUR questions from Section I. Each question carries 15 Marks.
- 2) Answer ANY TWO questions from Section II. Each question carries 20 Marks.
- 3) Answers to Both the sections to be written in SEPARATE answer books.
- 4) Use of non-programmable calculator is allowed.
- 5) Graph papers and statistical tables will provided on request.

SECTION - I

Q.1) Answer the following: (15 Marks X 1 = 15 Marks)

Discuss applications of Operations Research in Business Management.

Q.2) Answer the following: (15 Marks X 1 = 15 Marks)

A rubber company is engaged in producing three different kinds of tyres A, B and C. These three different tyres are produced at the company's two different plants, with different production capacities. In a normal 8 hours working day, plant I produces 50, 100 and 100 tyres of type A, B and C respectively. Plant 2 produces 60, 60 and 200 tyres of type A, B and C respectively. The monthly demand for tyre A, B and C is 2500, 3000 and 7000 units respectively. The daily cost of operation of plant 1 and plant 2 is Rs. 2500 and Rs. 3500 respectively. Formulate L.P.P. to find the minimum number of days of operations per month at two different plants to minimize the total cost while meeting the demand.

Q.3) Answer the following: (15 Marks X 1 = 15 Marks)

Find Initial basic Feasible solution by using Vogel's Approximation Method.

To \ From	D	E	F	Supply
A	6	4	1	50
B	3	8	7	40
C	4	4	2	60
Demand	20	95	35	150

Q.4) Answer the following: (15 Marks X 1 = 15 Marks)

Solve the following assignment problem.

Man \ Tasks	I	II	III	IV
A	15	13	14	17
B	11	12	15	13
C	13	12	10	11
D	15	17	14	16

Q.5) Write short notes on the following: Attempt ANY THREE (5 Marks X 3 = 15 Marks)

- a) Limitations of Operations Research in Business Management
- b) Maximization Case in Transportation Problem
- c) Limitations of Assignment Problem
- d) Difference between CPM and PERT

SECTION - II

Q.6) Answer the following: (20 Marks X 1 = 20 Marks)

Calculate Initial basic feasible solution using Matrix Minimum method (LCM) and find the optimal solution for the following transportation problem. Also check whether Alternate Solution exist.

From \ To	D ₁	D ₂	D ₃	D ₄	Supply
W ₁	100	120	90	60	700
W ₂	70	30	70	70	600
W ₃	60	60	90	110	900
Demand	600	400	600	200	

Q.7) Answer the following: (20 Marks X 1 = 20 Marks)

The following table lists the jobs of a network along with their time estimates :

Activity	Immediate Predecessor	Optimistic time	Most likely time	Pessimistic time
A	-	3	6	9
B	-	2	5	8
C	A	2	4	6
D	B	2	3	10
E	B	1	3	11
F	C,D	4	6	8
G	E	1	5	15

- i) Calculate expected duration of each activity
- ii) Draw Network diagram
- iii) Find critical path and total project duration

Q.8) Answer the following: (20 Marks X 1 = 20 Marks)

Following is the distribution of daily demand for refrigerators at a dealer's showroom.

Demand (in units)	10	20	30	40	50	60
Probability	0.06	0.10	0.15	0.40	0.16	0.13

Use the following sequence of random numbers to generate the demand for next 10 weeks.
Random Numbers : 93,53, 81, 93, 88, 22, 32, 96, 79, 06
