BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2018 COURSE)
B.C.A. Sem-IV : WINTER : 2021
SUBJECT: OPERATIONS RESEARCH

Day : Friday
Date : 14 01-2022

W-18780-2021

Time : 02:00 PM-05:00 PM
Max. Marks: 60

N.B.:

1) Question 4 from Section I is compulsory.
2) Answer ANY TWO questions from Q. 1, 2, 3 in Section I.
3) Answer ANY TWO questions from Q. 5, 6, 7 in Section II.
4) All questions CARRY EQUAL marks.
5) Answers to Both the sections to be written in SAME answer book
6) Draw a labeled diagram WHEREVER necessary

SECTION - I

Q.1) Answer the following: (12 Marks X 1 = 12 Marks)

Discuss scope of Operations Research.

Q.2) Answer the following: (12 Marks X 1 = 12 Marks)

An animal feed company must produce 200 kg of a mixture consisting of ingredients x_1 and x_2. The ingredient x_1 costs Rs. 3 per kg and x_2 cost Rs. 5 per kg. Not more than 80 kg of x_1 can be used and atleast 60 kg of x_2 must be used. Formulate LPP for the minimum cost mixture.

Q.3) Answer the following: (12 Marks X 1 = 12 Marks)

Find Initial basic Feasible solution by using North West Corner Method and Least Cost Method.

To / From	W_1	W_2	W_3	W_4	Supply
F_1	6	5	8	5	30
F_2	5	11	9	7	40
F_3	8	9	7	13	50
Demand	35	28	32	25	120

Q.4) Answer the following: Attempt ANY THREE (4 Marks X 3 = 12 Marks))

a) Historical Development of Operations Research
b) Artificial variables in LPP
c) Least Cost Method (LCM)
d) Maximization in Assignment Problem
e) Difference between CPM and PERT
f) Decision Tree

SECTION - II

Q.5) Answer the following (12 Marks X 1 = 12 Marks)

Given the time in (hours) required per project for different operators in the following table. Obtain an optimal assignment of projects to programmers. Does it have alternate optimal solution? If yes, find it.

Programmer / Project	P_1	P_2	P_3	P_4
1	20	30	40	50
2	40	50	60	70
3	70	80	90	80
4	30	50	80	40

Q.6) Answer the following (12 Marks X 1 = 12 Marks)

The following information regarding the project is given below.

Activity	1-2	1-3	1-4	2-3	2-6	3-5	3-6	4-5	5-6
Duration (days)	23	8	20	16	24	18	4	19	10

a)Draw Network diagram

b) Find Earliest and Latest times

c)Find critical path and total project duration

Q.7) Answer the following (12 Marks X 1 = 12 Marks)

The research department of a consumer products company has recommended the marketing department to launch a soap with three different perfumes. The marketing manager has to decide the type of perfume to launch under the following estimated pay-off for the various levels of sales.

Levels of sales	Types of Perfume		
	I	II	III
20,000	250	40	60
10,000	15	20	25
2,000	10	5	3

Estimate which type can be chosen under

i)Maximax Criterion

ii)Minimax Criterion

iii)Laplace Criterion (Assume probability 1/3 for each level of sales)

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