

CDOE
BACHELOR OF COMPUTER APPLICATIONS (CBCS-2019 COURSE)
B.C.A. SEM - IV : WINTER :- 2021
SUBJECT: OPERATIONS RESEARCH

Day : Friday
Date 18-02-2022

W-21880-2021

Time : 10:00 AM-01:00 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)

Define the term Operations Research. Explain Characteristics of Operations Research.

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

Alpha electronic company produces two product P_1 and P_2 that are produced and sold on weekly basis. The weekly production cannot exceeds 25 for product p_1 and 35 for product P_2 because of limited facilities. The company employees total of 60 workers. Product P_1 requires total 2 men weeks of labors and whereas P_2 requires only one. Profit margin on P_1 is Rs. 60 and on P_2 is Rs. 40. Formulate the above problem as LPP.

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

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

To \ From	P	Q	R	S	Supply
A	21	16	25	13	11
B	17	18	14	23	13
C	22	17	18	41	19
Demand	6	10	12	15	43

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

- a) Applications of Operations Research
- b) Formulation of LPP
- c) Unbalanced Supply and Demand
- d) Alternate Solution in Assignment Problem
- e) Rules for construction of Network diagram
- f) Maximax Criterion

SECTION - II

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

A company has four tasks to be performed. The estimates of the time, each subordinate would taken to be perform is given below. How the allocation of tasks is to be done (one to each man) so as to minimize the total man-hours.

Men \ Jobs	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.6) Answer the following (12 Marks X 1 = 12 Marks)

The activities of a project and estimated time in day's for each activity is given below.

Activity	1-2	1-3	1-4	2-5	3-5	3-6	3-7	4-6	5-7	6-8	7-8
Duration (days)	2	7	8	3	6	10	4	6	2	5	6

- i) Draw Network diagram
- ii Find Earliest and Latest times
- iii) Find Critical path and total project duration

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

You are given the following pay-offs of three acts A₁, A₂ and A₃ and states of Nature S₁, S₂ and S₃. The probabilities of these states of nature are respectively 0.1, 0.7 and 0.2. Calculate and tabulate the EMV and conclude which of the acts can be chosen as the best.

States of Nature	Act		
	A ₁	A ₂	A ₃
S ₁	25	-10	-125
S ₂	400	440	400
S ₃	650	740	750
