

Roll No



**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF MANAGEMENT  
END TERM EXAMINATION - JUN 2023**

**Semester :** Semester IV - 2021

**Course Code :** OE145

**Course Name :** Sem IV - OE145 - Optimisation Technique

**Program :** BBB,BBD&BBE

**Date :** 12-JUN-2023

**Time :** 1.00PM - 4.00PM

**Max Marks :** 100

**Weightage :** 50%

**Instructions:**

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

**PART A**

**ANSWER ALL THE QUESTIONS**

**(5 X 1 = 5M)**

1. For what value, the game is advantageous to Player A and Player B? (CO5) [Knowledge]
2. What is the abbreviation of CPM & PERT? (CO3) [Knowledge]
3. State the various objectives of Operations Research. (CO1) [Knowledge]
4. What is Idle time in the Sequence Model? (CO4) [Knowledge]
5. What are all methods in the transportation problem to find initial basic solution? (CO2) [Knowledge]

**PART B**

**ANSWER ALL THE QUESTIONS**

**(5 X 10 = 50M)**

6. We have seven jobs each of which has to go through the machine M1 and M2 in the order M1M2. Processing time (in hours) are given below. Determine a sequence of these jobs that will minimize the total elapsed time.

Job	1	2	3	4	5	6	7
Machine 1	3	12	15	6	10	11	9
Machine 2	8	10	10	6	12	1	3

(CO4) [Comprehension]

7. Discuss briefly the various phases of solving an Operations Research problems.

(CO1) [Comprehension]

8. Determine the optimal minimax strategies for each player in the following game.

a)

		Player B			
		B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>
Player A	A <sub>1</sub>	-5	2	0	7
	A <sub>2</sub>	5	6	4	8
	A <sub>2</sub>	4	0	2	-3

b)

		Player B		
		B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>
Player A	A <sub>1</sub>	-1	2	-2
	A <sub>2</sub>	6	4	-6

(CO5) [Comprehension]

9. A travelling salesman has to visit 5 cities. He wishes to start from a particular city, visit each city once and then return to his starting point. Cost of going from one city to another is shown below. You are required to find the least cost route.

		To City				
		A	B	C	D	E
From City	A	∞	4	10	14	2
	B	12	∞	6	10	4
	C	16	14	∞	8	14
	D	24	8	12	∞	10
	E	2	6	4	16	∞

(CO2) [Comprehension]

10. A, B, C can start simultaneously

$A < D, I; B < G, F; D < G, F; C < E; E < H, K; F < H, K; G, H < I$

(CO3) [Comprehension]

### PART C

ANSWER ALL THE QUESTIONS

(3 X 15 = 45M)

11. Solve the given pay-off matrix to find the value of the game

		Player B	
		B <sub>1</sub>	B <sub>2</sub>
Player A	A <sub>1</sub>	8	-7
	A <sub>2</sub>	-6	4

(CO5) [Application]

12. The following table shows the jobs of a network alongwith their time estimates

Job	1-2	1-6	2-3	2-4	3-5	4-5	6-7	5-8	7-8
a (days)	1	2	2	2	7	5	5	3	8
m ("	7	5	14	5	10	5	8	3	17
B ("	13	14	26	8	19	17	29	9	32

From the above information, you are required to

- Construct a network diagram
- Determine the time estimation and variance for each activity
- Determine the critical path and total project duration
- Determine the variance and Project length for the project.

(CO3) [Application]

13. A project schedule has the following characteristics

Activity	1-2	1-3	2-4	3-4	3-5	4-9	5-6	5-7	6-8	7-8	8-10	9-10
Time (Days)	4	1	1	1	6	5	4	8	1	2	5	7

From the above information, you are required to

- Construct a network diagram
- Compute the earliest event time and latest event time
- Determine the critical path and total project duration
- Compute total float and free float for each activity

(CO3) [Application]