Course Code: 24BB4C03

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

(AUTONOMOUS)

II-BBA II-Semester Regular Examinations (BR24), JUNE - 2026

OPERATIONS RESEARCH

BBA

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A and Part-B***

PART–A (10X2 = 20M)

		Marks	CO	BL
1. a)	What is the objective function in LPP?	(2M)	CO1	BL1
b)	What is the difference between quantitative and qualitative analysis in OR?	(2M)	CO1	BL1
c)	Define the transportation problem.	(2M)	CO2	BL1
d)	What is an unbalanced transportation problem?	(2M)	CO2	BL1
e)	What is sequencing in operation research?	(2M)	CO3	BL1
f)	What is running cost.	(2M)	CO3	BL2
g)	Why is it important to reduce a pay off matrix before solving?	(2M)	CO4	BL2
h)	What is a saddle point in game theory?	(2M)	CO4	BL1
i)	Define activity and event in a network.	(2M)	CO5	BL1
j)	What is cost slope.	(2M)	CO5	BL1

PART–B (5X10 = 50M)

2a.	Explain the origins and development of Operations Research.	5(M)	CO1	BL2
b.	Discuss the opportunities and shortcomings of Operations Research in managerial decision-making.	5(M)	CO1	BL2
	(OR)			
3a.	Solve the following LPP using Graphical Method Objective function Min Z=$20x + 10y$ Subject to the constraints $x + 2y \leq 40, 3x + y \geq 30, 4x + 3y \geq 60,$ Non negative conditions x,y≥0.	10(M)	CO1	BL3

4a.	Find the IBFS to the following Transportation problem	10(M)	CO2	BL3

	W_1	W_2	W_3	W_4	Availability
F_1	19	30	50	10	7
F_2	70	30	40	60	9
F_3	40	8	70	20	18
Requirement	5	8	7	14	

	(OR)			
5a	Describe the Hungarian Method for solving an assignment problem with an example.	5(M)	CO2	BL4

b	Explain the MODI method for testing the optimality of a transportation solution.	5(M)	CO2	BL2

6a.	Explain the Johnson's algorithm of processing n jobs through two machines.	5(M)	CO3	BL2
b	We have 5 jobs each of which must go through 2 machines in the order AB. Processing time are given in the table below.	5(M)	CO3	BL4

Job No.	1	2	3	4	5
Machine A	10	2	18	6	20
Machine B	4	12	14	16	8

Determine a sequence for the 5 jobs that will minimise the total elapsed time.

(OR)

7a.	Define replacement. Explain the different types of replacement policy with example?	5(M)	CO3	BL2
b.	A firm is considering replacement of a machine whose cost price is 12,200 Rs and scrap value is Rs. 200 the maintenance costs are found from experience to be as	5(M)	CO3	BL3

Year	1	2	3	4	5	6	7	8
Maintenance cost	200	500	800	1200	1800	2500	3200	4000

When should the machine be replaced ?

8a.	Explain Minimax and Maximin principle used in the theory of games.	5(M)	CO4	BL2
b.	What are assumptions made in game theory?	5(M)	CO4	BL1

(OR)

9a.	. Determine whether the following game is strictly determinable and fair or not. Player B Player A $\begin{bmatrix} 1 & 2 \\ -4 & -3 \end{bmatrix}$	5(M)	CO4	BL4
b	Define strategy? Explain the different types of strategy?	5(M)	CO4	BL2

10a	Explain the steps involved in drawing a network diagram with an example.	5(M)	CO5	BL2
b	Describe the steps involved in crashing a project.	5(M)	CO5	BL3

(OR)

11a	Tasks A,B,C,……,H,I constitute a project. The notation x<y means that the task x must be completed before y is started. With the notation, A<D,A<E, B<F, D<F, C<G, C<H, F<I, G<I. Draw a graph to represent the sequence of tasks and find the minimum time of completion of the project(CPM), when the time (in days) of completion of each task is as follows.	10(M)	CO5	BL4

Task	A	B	C	D	E	F	G	H	I
Time	8	10	8	10	16	17	18	14	9

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Faculty

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