TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous &Accredited with 'A' Grade by NAAC)

B.Tech III YR I Semester Mid- II Term Examinations Dec- 2022	
Branch Name: MECHANICAL	
Subject Name: OPERATION RESEARCH	set -1
Maximum Marks: 20	Duration: 1Hour 20 Minutes

Part-A (Objective Paper)			
Answer All the following questions. (5 Multiple choice& 5 Fill in the blanks) Marks: 10x1/2M = 5M		Blooms Taxonomy Level	Attainment of Course Outcomes
1	The region of feasible solution in LPP graphical method is called ____ (**D**) A. infeasible region B. unbounded region C. infinite region D. feasible region	L2	C01
2	_____method is used in Assignment Problem (**D**) A. ncwr B. lcm C. vam D. hungarian	L3	C01
3	WHICH OF THE FOLLOWING RULES MINIMIZES MAXIMUM LATENESS? (**B**) A.SPT B.EDD C.FCFS D.LS	L2	C01
4	Operations Research has the characteristic that it is done by a team of .... **A** ( ) A. Scientists B. Mathematicians C . Academicians	L2	C02

	D. Politicians		
5	Operations Research is a very powerful tool for .... ( ) **C** A. Operations B. Research C. Decision making B. None of these	L1	C01
6	The order cost per order of an inventory is Rs. 400 with an annual carrying cost of Rs. 10 per unit. The Economic Order Quantity (EOQ) for an annual demand of 2000 units is____**400**____	L1	C01
7	Operations Research has the characteristics the it is done by a team of _____	L2	C01
8	First stage decision is solved last in_____ recursive approach.	L3	C01
9	The objective function and constraints are functions of two types of variables, _____**Controllable**_____ variables and **uncontrollable.** variables.	L3	C02
10	The difference between total float and head event slack is _____ **the amount of time that the activity completion time can be delayed without affecting the earliest start time of the immediate successor activities in the network**	L3	C02

Part-B (Descriptive Paper)			
Answer All the following questions. Marks: 5Mx3= 15M		Blooms Taxonomy Level	Attainment of Course Outcomes
1	N Jobs 2 Machines sequencing problem on operation research 	JOB	1	2	3	4	5
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A	5	1	6	9	3
B	2	5	4	8	10		L1	C01
	OR		
2	Solve the following graphically. **NVS raju Pg 587** Player P	L2	C01

	B1	B2
A1	1	-3
A2	3	5
A3	-1	6
A4	4	1
A5	2	2
A6	-5	0

#	Question				L	CO
3	Solve by game theory method				L3	C01

3	6	1	4
2	8	6	7
5	2	4	2
3	5	6	7

	OR		
4	The production department for a company requires 3600kg of raw materials for manufacturing a particular item per year. It has been estimated that the cost of placing an order is Rs.36 and the cost of carrying inventory is 23% of investment on the inventories. The price is Rs.10 per kg. The purchase manager wishes to determine the operating doctrine for raw materials.	L3	C01
5	Find number of each three items to be included in a package so that value of package will be maximum. Total weight of package must not exceed 5 kgs.	L4	C02

Item	Weight in Kgs	Value in Rs
1	1	30
2	3	80
3	2	65

	OR		
6	Solve the following L.L.P by dynamic programming method: Maximize $Z=2X_1+5X_2$ **NVS raju pg 630** Subjected to $2X_1+X_2 \leq 430, 2X \leq 460$; $X_1, X_2 \geq 0$	L4	C02

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Note: 1. Set the question paper as per Syllabus mentioned

2. Descriptive each question carries 5 marks and may have a,b,c,d or i,ii,iii,iv as sub questions.

3. Indicate blooms taxonomy level as applicable. Example: Remembering as L1

B.Tech III YR I Semester Mid- II Term Examinations Dec- 2022	
Branch Name: MECHANICAL	
Subject Name: OPERATION RESEARCH set -2	
Maximum Marks: 20	Duration: 1Hour 20 Minutes

Part-A (Objective Paper)			
Answer All the following questions. (5 Multiple choice& 5 Fill in the blanks) Marks: 10x1/2M = 5M		Blooms Taxonomy Level	Attainment of Course Outcomes
1	The region of feasible solution in LPP graphical method is called ____ ( ) A. infeasible region B. unbounded region C. infinite region D. feasible region	L2	C01
2	WHICH OF THE FOLLOWING RULES MINIMIZES	L3	C01

	MAXIMUM LATENESS? ( ) A.SPT B.EDD C.FCFS D.LS		
3	Operations Research has the characteristic that it is done by a team of .... ( ) A. Scientists B. Mathematicians C. Academicians D. Politicians	L2	C02
4	Which of the following is not an inventory? A. Machines **A** B. Raw material C. Finished products D. Consumable tools	L2	C01
5	What have been constructed for Operations Research problems and methods for solving the models that are available in many cases? **C** A. Scientific Models B. Algorithms C. Mathematical Models D. None of the above	L1	C01
6	The time period between placing an order its receipt in stock is known as____**lead time**____	L1	C01
7	Operations Research cannot give perfect_____ to the problem. **Answers &Solutions**	L2	C02
8	The cost of insurance and taxes are included in _____ **Inventory carrying cost**	L3	C02

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9		L3	C01
10		L3	C01

Part-B (Descriptive Paper)		
Answer All the following questions.　　　　Marks: 5Mx3= 15M	Blooms Taxonomy Level	Attainment of Course Outcomes
1　　Use dominance principle to reduce the following game to2×2 game .is the game stable.　　**NVS raju Pg576** 		B1	B2	B3	B4
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A1	6	-10	9	0
A2	6	7	8	1
A3	8	7	15	1
A4	3	4	-1	4		L1	C01
OR		
2　The machine cost of a machine is Rs.15,500 and its scrap value is Rs.500. the maintenance costs found from experience are as follows: 	Year	1	2	3	4	5	6	7	8
------	-----	-----	-----	------	------	------	------	------
cost	200	500	700	1500	1400	1900	2400	3500 | When should the machine be replaced	L2	C01
3　Solve by game theory method 	3	6	1	4
----	----	----	----
4	8	6	3
5	9	11	2
15	12	6	7		L1	C01
OR		
4　Monthly demand for an item is 200 units. Ordering cost is Rs.350, inventory carrying charge is 24% of the purchasing price per year. The purchase prices are P_1=Rs.10for purchasing Q_1<500 ;P2=Rs.9.25 for purchasing $500 \leq Q_2$ 750 and P_3 =Rs 8.75 for purchasing $750 \leq Q_3$. Determine optimum purchase quantity. If the order cost is reduced to Rs.100 per order, compute the optimum purchase quantity.　　**Nvs raju pg 397**	L3	C01
5　Find number of each three items to be included in a package so that value of package will be maximum. Total weight of package must not exceed 5	L4	C02

kgs.

Item	Weight in Kgs	Value in Rs
1	1	30
2	3	80
3	2	65

NVS Raju Pg 626

	OR		
6	Describe decision rules for a purchase inventory model with two price breaks without shortages. Illustrate.	L4	C02

Note: 1. Set the question paper as per Syllabus mentioned

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3. Indicate blooms taxonomy level as applicable. Example: Remembering as L1

B.Tech III YR I Semester Mid- II Term Examinations Dec- 2022	
Branch Name: MECHANICAL	
Subject Name: OPERATION RESEARCH set-3	
Maximum Marks: 20	Duration: 1Hour 20 Minutes

Part-A (Objective Paper)		
Answer All the following questions. (5 Multiple choice& 5 Fill in the blanks) Marks: 10x1/2M = 5M	Blooms Taxonomy Level	Attainment of Course Outcomes
1	Operations Research has the characteristic that it is done by a team of .... ( )	L2	C01

	A. Scientists B. Mathematicians C . Academicians D. Politicians		
2	The region of feasible solution in LPP graphical method is called ____ ( ) A. infeasible region B. unbounded region C. infinite region D. feasible region	L3	C01
3	What aims at optimizing inventory levels? (**C**) A .Inventory Control B. Inventory Capacity C. Inventory Planning D. None of the above	L2	C01
4	The region of feasible solution in LPP graphical method is called ____ ( ) A. infeasible region B. unbounded region C. infinite region D. feasible region	L2	C01
5	Operations Research study generally involves how many phases ? (**A**) A.Three B. Four C. Five D. Two	L1	C02
6	The cost of insurance and taxes are included in _____	L1	C01

7	A game is said to be __fair game.__ if the value of game is zero.	L2	C01
8	Probabilistic models are also called __statistical models__	L3	C02
9	Linear Programming technique is used to allocate scarce resources in an optimum manner in problems of_____? __Schedule and Product Mix__	L3	C01
10	Operations Research cannot give perfect _____to the problem.	L3	C01

Part-B (Descriptive Paper)		
Answer All the following questions. Marks: 5Mx3= 15M	Blooms Taxonomy Level	Attainment of Course Outcomes
1 ⊙ Solve the following graphically.	L1	C01

Player B

	B1	B2
A1	1	-3
A2	3	5
A3	-1	6
A4	4	1
A5	2	2
A6	-5	0

OR		
2 The machine cost of a machine is Rs.10,500 and its scrap value is Rs.500. the maintenance costs found from experience are as follows:	L2	C01

Year	1	2	3	4	5	6	7	8
cost	200	300	500	900	1200	1500	2200	3500

When should the machine be replaced

| 3 | Monthly demand for an item is 200 units. Ordering cost is Rs.350, inventory carrying charge is 24% of the purchasing price per year. The purchase prices are P_1=Rs.10for purchasing Q_1<500 ;P2=Rs.9.25 for purchasing 500≤Q_2 750 and P_3 =Rs 8.75 for purchasing 750≤Q_3. Determine optimum purchase quantity. If the order cost is reduced to Rs.100 per order, compute the optimum purchase quantity. | L3 | C01 |

	OR		
4	The demand for an item is 6000 units per its production rate is 1000 units per month carrying cost is Rs 50 year and set up is Rs 2000 set up . The shortage cost is Rs 1000 per unit per year. Find various parameters the inventory system .	L3	C01
5	Solve the following L.L.P by dynamic programming method: $\quad$ Maximize $Z=2X_1+5X_2$ $\quad$ Subjected to $2X_1+X_2 \le 430, 2X \le 460$ $\quad X_1, X_2 \ge 0$	L4	C02
	OR		
6	Discuss about the model of instantaneous demand with shortage and continuous replenishment		
		L4	C02

Note: 1. Set the question paper as per Syllabus mentioned

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3. Indicate blooms taxonomy level as applicable. Example: Remembering as L1

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Branch Name: MECHANICAL	
Subject Name: OPERATION RESEARCH	set-4
Maximum Marks: 20	Duration: 1Hour 20 Minutes

Part-A (Objective Paper)			
Answer All the following questions. (5 Multiple choice& 5 Fill in the blanks) Marks: 10x1/2M = 5M		Blooms Taxonomy Level	Attainment of Course Outcomes
1	_____ are called mathematical models (**C**) A. Iconic Models B. Analogue Models C. Symbolic Models D. None of the above	L2	C01
2	Operations Research has the characteristic that it is done by a team of .... ( ) A. Scientists B. Mathematicians C . Academicians D. Politicians	L3	C01
3	Operations Research study generally involves how many phases ? ( ) A. Three B. Four C. Five D. Two	L2	C01
4	WHICH OF THE FOLLOWING RULES MINIMIZES MAXIMUM LATENESS? ( ) A.SPT B.EDD C.FCFS D.LS	L2	C02

5	Graphic method can be applied to solve a LPP when there are only -_____ variable **C** A. One B. More than One C. Two D. Three	L1	C01
6	Operations Research cannot give perfect _____ to the problem.	L1	C01
7	Allocation problems can be solved by_____ **Linear Programming Technique and Non – Linear Programming Technique.**	L2	C02
8	Probabilistic models are also called _____	L3	C02
9	Operations Research attempts to find the best and__**Optimum**_____ solution to a problem	L3	C01
10	The cost of insurance and taxes are included in_____	L3	C01

Part-B (Descriptive Paper)		
Answer All the following questions. Marks: 5Mx3= 15M	Blooms Taxonomy Level	Attainment of Course Outcomes
1 Use dominance principle to reduce the following game to2×2 game .is the game stable.	L1	C01

	B1	B2	B3	B4
A1	6	-10	9	0
A2	6	7	8	1
A3	8	7	15	1
A4	3	4	-1	4

OR		
2 The machine cost of a machine is Rs.10,500 and its scrap value is Rs.500. the maintenance costs found from experience are as follows:	L2	C01

Year	1	2	3	4	5	6	7	8
cost	300	500	700	1000	1400	1900	2400	3000

When should the machine be replaced

3	Solve by game theory method	L3	C01

10	8	1	4
2	6	5	7
9	4	3	2
9	1	6	8

	OR		
4	The production department for a company requires 3600kg of raw materials for manufacturing a particular item per year. It has been estimated that the cost of placing an order is Rs.36 and the cost of carrying inventory is 23% of investment on the inventories. The price is Rs.10 per kg. The purchase manager wishes to determine the operating doctrine for raw materials.	L3	C01
5	A contract has to supply 10,000 bearings per to an automobile manufacturer. He find that he starts production run , he can produce 20,000 bearing per day. The cost of holding a bearing in stock for one year is 30 paisa and set up cost production run is Rs 280 how frequently, should the production run be made ?	L4	C02
	OR		

6	Solve the following L.L.P by dynamic programming method:
	    Maximize $Z=2X_1+5X_2$
	    Subjected to $2X_1+X_2 \leq 430, 2X \leq 460$
	    $X_1, X_2 \geq 0$
		L4	C02

Note: 1. Set the question paper as per Syllabus mentioned

   2. Descriptive each question carries 5 marks and may have a,b,c,d or i,ii,iii,iv as sub questions.

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