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DEPARTMENT OF MECHANICAL ENGINEERING

"END TERM Examination, JAN-2023"

SEMESTER	**I**	**DATE OF EXAM**	**13/01/2023**
SUBJECT NAME	**Principles of Manufacturing**	**SUBJECT CODE**	**MCH 111B**
BRANCH	**BBA (GOM)**	**SESSION**	**I**
TIME	**9:00-12:00**	**MAX. MARKS**	**80**
PROGRAM	**BBA**	**CREDITS**	**3**
NAME OF FACULTY	**MNDEEP BHADANA**	**NAME OF COURSE COORDINATOR**	**MANDEEP BHADANA**

***Note**: Part A&B: Questions will be of 10 Marks each.*
Part C&D:. Each question will be of 15 marks. Attempt all questions.

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A&B	Q1	Classify the manufacturing industries on different basis. List the different sectors of Indian economy with examples.	10	CO1	L1	1.1
	Q2	Explain Deming's philosophy for quality improvement?	10	CO2	L2	2.1
PART-C	Q3	What is Statistical Process Control? Discuss the different Statistical process control tools with suitable examples.	15	CO3	L3	3.1
	Q4	What do you mean by logistic management system? Write the function of logistics. Also explains different types of logistics and write the difference between SCM and logistics management.	15	CO3	L3	3.2
PART-D	Q5	What is advanced Manufacturing? Explore a range of new and emerging trends in advanced manufacturing with their application.	15	CO4	L4	4.1
	Q6	Describe primary and secondary manufacturing processes by giving suitable example. Differentiate between conventional and unconventional machining. How unconventional machining becomes first choice not an alternative of conventional machining.	15	CO4	L4	4.2

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DEPARTMENT OF MECHANICAL ENGINEERING

"T3 Examination, DEC-2022"

SEMESTER	**III**	**DATE OF EXAM**	**21/12/2022**
SUBJECT NAME	**WAREHOUSE MANAGEMENT**	**SUBJECT CODE**	**MCH 209B**
BRANCH	**BBA OM**	**SESSION**	**MORNING**
TIME	**9:00-12:00**	**MAX. MARKS**	**80**
PROGRAM	**BBA**	**CREDITS**	**3**
NAME OF FACULTY	**MNDEEP BHADANA**	**NAME OF COURSE COORDINATOR**	**MANDEEP BHADANA**

Note: Part A&B: Questions will be of 10 Marks each.
Part C&D:. Each question will be of 15 marks. Attempt all questions.

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A&B	Q1	Differentiate between the different types of warehouses used in various industries by giving suitable examples.	10	CO1	L1	1.1
	Q2	Explain the objective and scope of Warehousing. Logistics play an important role in Warehousing, how?	10	CO2	L2	1.2
PART-C	Q3	What is the role of a good warehouse layout design? Explain material handling and packaging with example. Write some storage and handling equipment used in warehousing.	15	CO3	L3	3.1
	Q4	What do you mean by warehousing management system? Write the objective of WMS. Explain the storage principle in warehousing.	15	CO3	L3	3.2
PART-D	Q5	Explain the concept of Resourcing a warehouse. What is the objectives of resourcing? Write various cost involved in warehousing.	15	CO4	L4	4.1
	Q6	What is outsourcing ? Write the advantages of outsourcing with example. Explain how outsourcing help in growing a new business.	15	CO4	L4	4.2

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DEPARTMENT OF MECHANICAL ENGINEERING

"T3 Examination, DEC-2022"

SEMESTER	**V**	**DATE OF EXAM**	**14/12/2022**
SUBJECT NAME	**PURCHASING AND INVENTORY MANAGEMENT**	**SUBJECT CODE**	**MCH 314B**
BRANCH	**BBA OM**	**SESSION**	**EVENING**
TIME	**1:00-4:00**	**MAX. MARKS**	**80**
PROGRAM	**BBA**	**CREDITS**	**3**
NAME OF FACULTY	**MNDEEP BHADANA**	**NAME OF COURSE COORDINATOR**	**MANDEEP BHADANA**

Note: Part A&B: Questions will be of 10 Marks each.
Part C&D:. Each question will be of 15 marks. Attempt all questions.

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A&B	Q1	Define Purchasing Management? How does Purchasing management play an important role in an organization.	10	CO1	L1	1.1
	Q2	Explain the objective and scope of Inventory management in today's market. Also write the role of inventory model with purchase discount.	10	CO2	L2	1.2
PART-C	Q3	What is the role of a good purchasing and inventory management system? Explain the F.S.N and X.Y.Z analysis with examples.	15	CO3	L3	3.1
	Q4	Why Inventory Management Plays a Crucial Role in the Logistics Industry. Explain the procedure for setting up an efficient inventory control system.	15	CO3	L3	3.2
PART-D	Q5	Explain the processes and difficulties in store management. How location and layout play an important role in store management. What are the new developments in storing?	15	CO4	L4	4.1
	Q6	What is material mangement costs and how ICT reduces these costs? Write the advantages of material management .	15	CO4	L4	4.2

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DEPARTMENT OF MECHANICAL ENGINEERING

"T3 Examination, Jan-2023"

SEMESTER	**1st**	**DATE OF EXAM**	**13/01/2023**
SUBJECT NAME	**Work Measurement Techniques**	**SUBJECT CODE**	**MEH 505B-T**
BRANCH	**Mechanical-M.Tech**	**SESSION**	**Morning**
TIME	**9:00 AM to 12:00 Noon**	**MAX. MARKS**	**75**
PROGRAM	**PG**	**CREDITS**	**4**
NAME OF FACULTY	**Dr. Ajit**	**NAME OF COURSE COORDINATOR**	**Dr. Ajit**

***Note**: Part A & B : All questions are compulsory. Questions will be of descriptive type or numerical.*

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A	1(A)	Why is work study valuable? Define work content added by inefficient methods of manufacture or operation.	5	CO1	BT2	12.2.11 2.2.2
	1(B)	What is meant by micro motion and memo motion study?	5	CO1	BT1	12.3.1
PART-B	Q2	What is meant by method study, its objectives and steps involved (i.e. procedure of method study)?	5	CO2	BT3	10.3.1
PART-C	3(A)	Define the term reliability? Explain the reliability function. What are the Roles of a Reliability Engineer?	10	CO3	BT4	3.1.4
	3(B)	An architect has been awarded a contract to prepare plans for an urban renewal project. The job consists of the following activities and their estimated times.	10	CO3	BT4	10.3.11 2.1.1

Activity	Description	Immediate Predecessor	Time (days)
A	Prepare preliminary sketches	-	2
B	Outline specifications	-	1
C	Prepare drawings	A	3

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		D	Write specifications	A,B	2		
		E	Run off prints	C,D	1		
		F	Have specifications	B,D	3		
		G	Assemble bid packages	E,F	1		
		(a) Draw the network diagram of activities for the project. (b) Indicate the critical path and calculate the total float and free float for each activity.					
	3(C)	For the given activities determine: 1. Critical path using PERT. 2. Calculate variance and standard deviation for each activity. 3. Calculate the probability of completing the project in 26 days.		10			
		Activity	to	tm	tp		
		1-2	6	9	12		
		1-3	3	4	11		
		2-4	2	5	14		
		3-4	4	6	8		
		3-5	1	1.5	5		
		2-6	5	6	7		
		4-6	7	8	15		
		5-6	1	2	3	CO4	BT2	1.1.2
PART-D	Q4(A)	The following table gives the operation times and due dates for five jobs which are to be processed on a machine. Assign the jobs according to the shortest operation time and calculate the mean flow time. JOB PROCESSING TIME DUE DATE(DAYS) 101 6days 5 102 7days 3 103 4 days 4 104 9days 7 105 5days 2		10		CO3	BT4	12.2.11 2.2.2
	Q4(B)	100 % reliability of all the components of a machine or equipment is not always aimed to achieve. Why?		10		CO3	BT3	10.3.1
	Q4(C)	Define Productivity and work study and explain the relation between them. What are the techniques of work study?		10		CO4	BT3	10.3.1

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DEPARTMENT OF MECHANICAL ENGG.

"End Term Examination, Jan-2023"

SEMESTER	**1st**	**DATE OF EXAM**	**16.01.2023**
SUBJECT NAME	**METAL FORMING ANALYSIS**	**SUBJECT CODE**	**MEH503B-T**
BRANCH	**ME**	**SESSION**	**MORNING**
TIME	**09:00AM TO 12:00 NOON**	**MAX. MARKS**	**100**
PROGRAM	**M.TECH**	**CREDITS**	**04**
NAME OF FACULTY	**GIANENDER KAJAL**	**NAME OF COURSE COORDINATOR**	**GIANENDER KAJAL**

***Note**: All questions are compulsory. Questions will be of descriptive type or numerical.*

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A	1(A)	Explain the classification of metal forming process. What is the importance of giving proper clearance between the punch and the die?	05	CO1	BT3	12.2.11 2.2.2
	1(B)	What defects are generally possible in extruded parts? Briefly describe these defects.	05	CO1	BT2,3	10.3.1
	1(C)	For hot working it is often necessary to heat the work piece in a furnace and there are scale losses and other problems. Why is hot working sometimes preferred to cold working in spite of such disadvantages?	05	CO2	BT5	3.1.2
	1(D)	A single pass rolling using 410 mm diameter steel strip, a strip of width 140 mm and thickness 8 mm undergoes 10% reduction of thickness. The angle of byte in radian is?	05	CO2	BT4	3.1.2
PART-B (I)	2(A)	Sketch the hydrostatic extrusion process. Compare it with the direct extrusion process. Support your answer with reasons	10	CO3	BT4,5	10.3.11 2.1.1
	2(B)	Explain the typical arrangement of roll & roll mills with neat sketches. Explain various Rolling defects.	10	CO3	BT3	1.1.2

	3(A)	Explain the advantages and disadvantages of compound dies over progressive dies. Also, explain clearance in sheet metal operation.	10	CO3	BT2	12.2.1
	3(B)	Explain the process of sheet metal shearing operation done with a punch and die. Also, explain, with the help of suitable sketches, the difference between punching and perforating operations. Give application of the two operations.	10	CO4	BT2	12.2.11 2.2.2
PART-B (II)	4(A)	Describe the process of extrusion as applied to metals. Give suitable sketches of both the forward and backward processes. Compare the two processes with respect to the length of extruded part and the force required for extruding.	10	CO4	BT3	10.3.1
	4(B)	Explain the difference between hot working and cold working processes. What is the significant effect of hot working process in heat treatment?	10	CO4	BT3	12.2.11 2.2.2
	Q5	Differentiate between (i) Bending and Drawing operations (ii) Shaving, Nibbling and blanking operations (iii) Coining and embossing	20	CO4	BT3	10.3.1

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DEPARTMENT OF MECHANICAL ENGINEERING

"End Term Examination, Jan-2023"

SEMESTER	**1st**	**DATE OF EXAM**	**17th Jan 2023**
SUBJECT NAME	**Research Methodology**	**SUBJECT CODE**	**MES506B**
BRANCH	**Mechanical**	**SESSION**	**I**
TIME	**90 mins**	**MAX. MARKS**	**40**
PROGRAM	**M.Tech.**	**CREDITS**	**1**
NAME OF FACULTY	**Dr. Prashant Bhardwaj**	**NAME OF COURSE COORDINATOR**	**Dr. Prashant Bhardwaj**

***Note**: All questions are compulsory. Each questions carries equal marks.*

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL
PART-A	**Q1**	Prepare a detailed research proposal on your proposed research topic?	10	CO1	BT2
PART-B	**Q2**	Explain the concept of attitude scale? Explain the Likert's scale to measure attitude?	10	CO2	BT3
PART-C	**Q3**	Find the inverse of $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$, if it exists	10	CO3	BT4
PART-D	**Q4**	Marks scored by 6 participants in a competition by two judges are given below: Judge 1: 30, 36, 47, 48, 32, 28 Judge 2: 28, 38, 49, 46, 30, 26 Calculate rank correlation for the given data.	10	CO4	BT4

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DEPARTMENT OF MECHANICAL ENGINEERING

"End Term Examination, Jan-2023"

SEMESTER	**1ST**	**DATE OF EXAM**	19.01.2023
SUBJECT NAME	**Production system and management**	**SUBJECT CODE**	**MEH502B-T**
BRANCH	**Manufacturing and Automation**	**SESSION**	**1ST**
TIME	**9:00 – 12:00**	**MAX. MARKS**	**100**
PROGRAM	**M.TECH - ME**	**CREDITS**	4
NAME OF FACULTY	**J P SHARMA**	**NAME OF COURSE COORDINATOR**	**J P SHARMA**

Note: Part A & B : All questions are compulsory.
Part C & D:

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A	1(A)	Define Inventry.	2	CO1	L2	1.2.1
	1(B)	What do you mean by waste management?	2	CO1	L2	1.2.1
	1(C)	Give the meaning of control chart?	2	CO1	L2	1.2.1
	1(D)	What is Material handling?	2	CO1	L2	1.2.1
	1(E)	What are the form of inventories	2	CO1	L2	1.2.1
PART-B	Q2(A)	Define production system. Explain in brief its classification.	10	CO2	L2	1.2.1
	Q2(B)	Explain briefly the different type of production system.				
PART-C	Q3(A)	Find the maximum value of objective function $z = 4x + 2y$ Where $x \geq 0$ and $y \geq 0$, subjected to the constraints $x + 2y \geq 4$, $3x + y \geq 7$, $-x + 2y \geq 7$	10	CO3	L3	1.3.2
	3(B)	A manufacturing company makes two models A and B of a product. Each piece of Model A requires 9 labour hours for fabricating and 1 labour hour for finishing. Each piece of Model B requires 12 labour hours for fabricating and 3 labour hours for finishing.	10	CO3	L3	1.3.2

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		For fabricating and finishing, the maximum labour hours available are 180 and 30 respectively. The company makes a profit of Rs 8000 on each piece of model A and Rs 12000 on each piece of Model B. How many pieces of Model A and Model B should be manufactured per week to realise a maximum profit? What is the maximum profit per week?				
	Q4(A)	Explain Lean manufacturing and its benefits. Also write 5 principals of lean thinking.	10	CO3	L4	1.3.3
	4(B)	What do you mean by Toyota Production system? Also write goals of TPS.	10	CO3	L4	1.3.3
PART-D	Q5	Explain 14 principals of management toward management theory by Henri Fayol in brief.	20	CO4	L3	1.2.1
	Q6	Explain how the incentive plans are developed. Write about the reaction towards Incentive wages. How it affect the efficiency and employment.	20	CO4	L3	1.2.1

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DEPARTMENT OF Mechanical Engineering

"End Term Examination, Jan-2023"

SEMESTER	**1st**	**DATE OF EXAM**	**21.01.2023**
SUBJECT NAME	**MODERN MANUFACTURING PROCESS**	**SUBJECT CODE**	**MEH501B-T**
BRANCH	**ME**	**SESSION**	**Morning**
TIME	**09:00 AM TO 12:00 NOON**	**MAX. MARKS**	**75**
PROGRAM	**M.TECH**	**CREDITS**	**04**
NAME OF FACULTY	**NAZISH AHMAD SHAMSI**	**SIGNATURE OF HoD**	

Note: Part A: All questions are compulsory. Part B & C: Attempt any two questions.

	Q.NO.	QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A	1(A)	What are the criteria which controls the MMP?	5	CO1	BT2	1.3.1
	1(B)	What do you understand from the term Gating system? What are the main requirements expected of an ideal gating system?	5	CO2	BT2	1.3.1
	1(C)	State the Advantages and Disadvantages of casting processes.	5	CO2	BT1	1.4.1
PART-B	Q2(A)	A) Comment on the advantages and disadvantages of Modern welding techniques used in various industrial applications? B) Modern welding technique is widely used in various industrial application. Justify the statement with suitable example.	7+8	CO3	BT3	2.3.1,1 2.1.1
	Q2(B)	With a suitable diagram discuss the working of Laser Beam Welding. Also state its advantages and disadvantages.	15	CO3	BT2	2.2.4
	Q2(C)	Explain the working principle of EBW with suitable sketch. What are the advantages and disadvantages of EBW?	15	CO3	BT3	2.2.4

PART-C	Q3(A)	Why the use of Electro hydraulic Forming is increasing, Explain? State its working principle by using suitable diagram. Also discuss its advantages and disadvantages?	15	CO4	BT3	2.3.2,1 2.1.1
	Q3(B)	Explain the explosive forming technique. Differentiate between the standoff and contact technique used in industry.	15	CO4	BT4	2.1.4
	Q3(C)	What are the various process parameters considered in HERP processes. Also discuss their effects.	15	CO4	BT3	2.1.4

********** END **********

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DEPARTMENT OF MECHANICAL ENGINEERING

"End Term Examination, Jan-2023"

SEMESTER	**I**	**DATE OF EXAM**	**17/01/2023**
SUBJECT NAME	**INTRODUCTION TO ROBOTICS**	**SUBJECT CODE**	**MEH108B-T**
BRANCH	**CSE – Robotics & Artificial Intelligence**	**SESSION**	**2022-23 (Morning)**
TIME	**2 hours**	**MAX. MARKS**	**75**
PROGRAM	**B.TECH**	**CREDITS**	**4**
NAME OF FACULTY	**Dr. VINEET DUBEY**	**NAME OF COURSE COORDINATOR**	**Dr. VINEET DUBEY**

Note: Part A: (9 marks) All questions are compulsory (Q1 (A)(B)(C)).
Part B: (6 marks) All questions are compulsory (Q2 (A)(B).
Part C: (30 marks) All questions are compulsory (Q 3(A)(B) and Q4(A)(B))
Part C: (30 marks) All questions are compulsory (Q 5(A)(B) and Q6(A)(B))

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A	Q1(A)	Define programmable automation with suitable example	3	CO1	BT1	1.4.1
	Q1(B)	Discuss the advantages of gear drive over belt drive?	3	CO1	BT2	1.4.1
	1(C)	What are robot end effector? Draw a diagram of the robotic end effector.	3	CO2	BT1	1.4.1
PART-B	Q2(A)	Explain the term "Accuracy" in respect of robotics.	3	CO3	BT2	1.4.1
	Q2(B)	Explain automated manufacturing system.	3	CO2	BT2	1.4.1
PART-C	Q3(A)	Explain the various drive system used with an industrial robot and compare their features, merits and demerits.	10	CO4	BT2	1.4.1
	Q3(B)	Classify the types of automation? Explain the features of each automation?	5	CO3	BT3	1.4.1

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	Q4(A)	Explain the laws of the robot given by Asimov?	10	CO2	BT3	1.4.1
	Q4(B)	Illustrate the different criterion to choose a sensor?	5	CO4	BT3	1.4.1
PART-D	Q5(A)	Elaborate the concept of Industry 4.0. Explain the different pillars of Industry 4.0.	10	CO4	BT3	1.4.1
	Q5(B)	Evaluate the framework for management to analyze economics of robotic system.	5	CO4	BT4	1.4.1
	Q6(A)	Distinguish between sensor and transducers and briefly explain the real life application of robots.	10	CO3	BT4	1.4.2
	Q6(B)	Differentiate between hydraulic actuator and pneumatic actuator with suitable examples.	5	CO4	BT3	1.4.1
		TOTAL MARKS	**75**			

********** **END** **********

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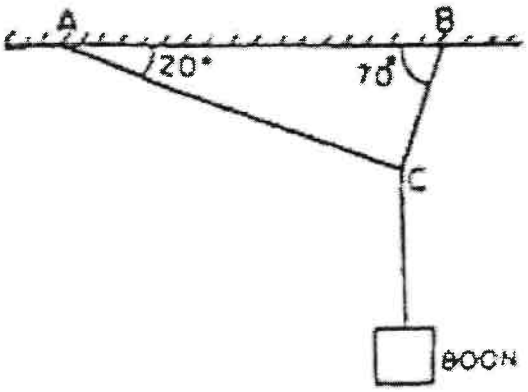
DEPARTMENT OF MECHANICAL ENGINEERING

"End Term Examination, Jan-2023"

SEMESTER	**1ST**	**DATE OF EXAM**	**19.01.2023**
SUBJECT NAME	**ENGINEERING MECHANICS**	**SUBJECT CODE**	**MEH101B**
BRANCH	**SMA**	**SESSION**	**1ST**
TIME	**9:00 – 12:00**	**MAX. MARKS**	**100**
PROGRAM	**B.TECH**	**CREDITS**	**4**
NAME OF FACULTY	**J P SHARMA**	**NAME OF COURSE COORDINATOR**	**J P SHARMA**

***Note**: Part A & B : All questions are compulsory.*
Part C & D: Attempt any four questions. 2 question from each section

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A	1(A)	State and prove Lami's theorem with block diagram.	5	CO1	L2	1.2.1
	1(B)	What is the resultant and the angle made when more than two forces act at a point.	5	CO1	L3	1.3.1
PART-B	Q2(A)	The resultant of two concurrent forces is 1500N and the angle between the forces is 90°. The resultant makes and angle of 36° with one of the force. Fine the magnitude of each force	10	CO2	L2	1.2.1
PART-C	Q3(A)	A weight of 800 N is supported by two chains as shown in figure. Determine the tension in each chain. 	10	CO3	L3	1.3.2

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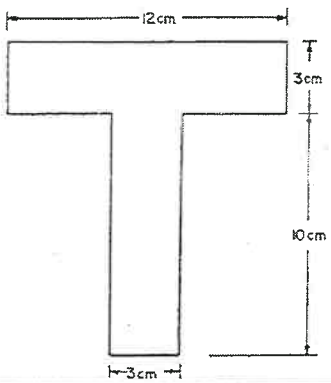
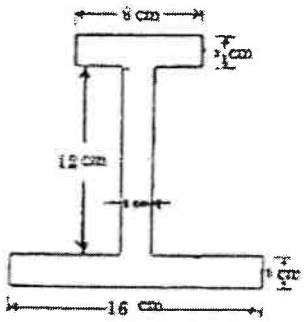
	3(B)	Write expression for resultant of two parallel forces when: a) Like in nature b) Unlike and unequal in magnitude c) Unlike and equal in magnitude	10	CO3	L3	1.3.2
	Q4(A)	A circular roller of weight 100 N and radius 10 cm hangs by a tie road AB = 20 cm and rest against a smooth vertical wall at C. Determine a) The force F in the tie rod and b) The reaction R_C at point C.	10	CO3	L4	1.3.3
	4(B)	Two identical rollers P and Q, each of weight W are supported by an inclined plane and a vertical wall as shown in figure. Assume all the surface to be smooth. Draw the free body diagram of a) Roller Q b) Roller P c) Roller P and Q taken together	10	CO3	L4	1.3.3
	Q5(A)	Find the center of gravity of the T section shown in figure 	10	CO3	L4	1.3.3
	5(B)	Prove that centroid of circular section by integration is 0.	10	CO3	L4	1.3.3
PART-D	Q6(A)	Find the moment of inertia of the section about the centroidal axis X-X perpendicular to the web 	20	CO4	L3	1.2.1

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Q7(A)	Define a) Friciton b) Force of friction c) Co-efficient of friction d) Angle of friciton	10	CO4	L3	1.2.1
Q7(B)	A pull of 20 N, inclined at 25° to the horizontal plane, is required just to move a body placed on a rough horizontal plane. But the push required to move the body is 25N. If the push is inclined at 25° to the horizontal, find the weight of the body and co-efficient of friction.	10	CO4	L3	1.2.1
Q8(A)	A ladder 5 m long and 250 N weight is place against a vertical wall in a position where its inclination to the vertical is 30°. A man weighting 800N climbs the ladder. At what position will he induce slipping? The coefficient of friction for both the contact surface of the ladder i.e. with wall and the floor is 0.2	20	CO4	L4	1.3.1

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DEPARTMENT OF MECHANICAL ENGINEERING

"End Term Examination, Jan-2023"

SEMESTER	**1st**	**DATE OF EXAM**	**23/01/2023**
SUBJECT NAME	**THERMODYNAMICS**	**SUBJECT CODE**	**MEH-105-B**
BRANCH	**Mechanical Engineering (SMA)**	**SESSION**	**2022-23 (I)**
TIME	**9:00-12:00 pm**	**MAX. MARKS**	**100**
PROGRAM	**B.Tech**	**CREDITS**	**3**
NAME OF FACULTY	**Ms. Smriti Mishra**	**NAME OF COURSE COORDINATOR**	**Ms. Smriti Mishra**

***Note**: Part A & Part B: All questions are compulsory. Questions will be of short answer type. Part C & Part D: Questions will be of descriptive type or numerical. Attempt any four questions from each parts.*

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL
PART-A	1(A)	Briefly explain the following terms: • Thermodynamic properties • Intensive Properties • Extensive Properties • Path Function • Point Function	5	1	BT 2
	1(B)	Illustrate Zeroth Law of Thermodynamics. Explain, how the Zeroth law of thermodynamics can be used for temperature measurement.	5	1	BT 3
PART-B	Q2(A)	A gas at 65 kPa, 200°C is heated in a closed, rigid vessel till it reaches 400°C. Determine the amount of heat required for 0.5 kg of this gas if internal energy at 200°C and 400°C are 26.6 kJ/kg and 37.8 kJ/kg respectively.	5	2	BT 4
	2(B)	Illustrate the first law of thermodynamics. What are the limitations of the law. Write down the steady state energy equation.	5	2	BT 3

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PART-C	Q3(A)	State second law of thermodynamics on the basis of Kelvin Plank's and Claussius statement. Why PMM-2 is not feasible and what is the concept of entropy?	10	3	BT 4
	3(B)	Briefly explain Carnot theorem. Why Carnot engine is not possible practically? Draw Carnot cycle on T-S diagram.	10	3	BT 3
	3 (C)	A reversible heat engine operates between two reservoirs at 827°C and 27°C. Engine drives a Carnot refrigerator maintaining –13°C and rejecting heat to reservoir at 27°C. Heat input to the engine is 2000 kJ and the net work available is 300 kJ. How much heat is transferred to refrigerant and total heat rejected to reservoir at 27°C	10	3	BT 5
	3 (D)	To a closed system 150 kJ of work is supplied. If the initial volume is 0.6m³ and pressure of the system changes as p= 8-4V, where p is in bar and V is in m³. Determine the final volume and pressure of the system.	10	3	BT 5
	3(E)	Derive an expression for the work done of the isothermal and adiabatic processes.	10	3	BT 4
PART-D	Q4(A)	What is vapour compression cycle. Draw the cycle and explain its components. Compare it with Carnot cycle.	10	4	BT 2/BT 3
	4(B)	What is dryness fraction? What amount of heat is required to produce 4.4 kg of steam at a pressure of 6 bar and temperature of 250°C from water at 30°C? Take specific heat of superheated steam as 2.2 kJ/kg-K.	10	4	BT 4
	4(C)	Differentiate Reversible and Irreversible processes. What is thermodynamic temperature scale. Write down the Clausius inequality for both reversible and irreversible engine.	10	4	BT 3
	4(D)	A vessel having a capacity of 0.05m³ contains a mixture of saturated water and saturated steam at a temperature of 245°C. The mass of liquid present is 10 kg. Find the following: The pressure, Mass, Specific Volume, Specific enthalpy, Specific entropy, Specific internal energy.	10	4	BT 4
	4(E)	What is the availability and irreversibility of the system? How is availability associated with heat and work? Differentiate Exergy and energy for thermodynamic system.	10	4	BT 2

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DEPARTMENT OF MECHANICAL ENGINEERING

"End Term Examination, Dec.-2022"

SEMESTER	**3rd**	**DATE OF EXAM**	**13th Dec. 2022**
SUBJECT NAME	**Theory of Metal Cutting**	**SUBJECT CODE**	**MEH601B**
BRANCH	**ME**	**SESSION**	**2022-23**
TIME	**09.00 AM to 12.00 PM**	**MAX. MARKS**	**100**
PROGRAM	**M.Tech**	**CREDITS**	**03**
NAME OF FACULTY	**GIANENDER KAJAL**	**NAME OF COURSE COORDINATOR**	**GIANENDER KAJAL**

Note: All questions are compulsory. Questions will be of the descriptive type or numerical.

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART (A)	1(A)	Differentiate between orthogonal and oblique cutting. Draw merchant's force circle diagram for orthogonal cutting process. Give two examples of oblique cutting.	05	CO1	BT3	10.2.1
	1(B)	Discuss any three important tool materials with respect to composition and applications	05	CO1	BT2,3	12.2.1
PART (B)	2(A)	The useful tool life of a HSS tool machining mild steel at 18 m/min is 3 hours. Calculate the tool life when the tool operates at 24 m/min. Take n = 0.125.	05	CO2	BT4	3.2.4
	2(B)	What are the sources of heat generation in machining?	05	CO2	BT3	10.3.1, 12.1.1
PART (C)	3(A)	State the important functions of cutting fluids and explain their classification.	10	CO3	BT3	1.2.2
	3(B)	Sketch the nomenclature of tool in American System with tool geometry. Also explain the tool wear significance	10	CO3	BT2	12.1.1
	3(C)	Define the abrasive machining process. Also explain the mechanism of grinding with examples. What are the requirements of a dynamometer for measuring forces in cutting?	10	CO3	BT2,3	12.2.1 12.2.3
	3(D)	Discuss the different mechanisms of tool wear. Explain following kinds of tool damage: (i) Flank wear (ii) Crater wear	10	CO3	BT2,3	10.2.1

PART (D)	4(A)	Explain the classification of machining process with their practical application.	10	CO4	BT2	12.2.1 12.2.5
	4(B)	Explain the different types of chip formation and their effects on machining.	10	CO4	BT3	10.5.1
	4(C)	(a) Describe nomenclature of single point cutting tool. (b) What is tool life? How can you measure it? Discuss different factors affecting tool life.	10	CO4	BT3	10.5.1
	4(D)	Explain the effects of various parameters on temperature developed during machining	10	CO4	BT3	10.5.1
		********** END **********				

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DEPARTMENT OF MECHANICAL ENGINEERING

"T3 Examination, DEC-2022"

SEMESTER	**III**	**DATE OF EXAM**	**15/12/2022**
SUBJECT NAME	GLOBAL LOGISTICS SYSTEM	**SUBJECT CODE**	**MEH 605B**
BRANCH	**ME**	**SESSION**	**MORNING**
TIME	**9:00-12:00**	**MAX. MARKS**	80
PROGRAM	**M.TECH.**	**CREDITS**	**3**
NAME OF FACULTY	**MANDEEP BHADANA**	**NAME OF COURSE COORDINATOR**	**MANDEEP BHADANA**

Note: Part A&B: Questions will be of 7.5 Marks each.
Part C&D:. Each question will be of 15 marks. Attempt all questions.

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A&B	Q1	What are logistics metrics to measure supply chain efficiency in warehouse.	10	CO1	L1	1.1
	Q2	Explain Inventory under certainly & uncertainty, Risk Management.	10	CO2	L2	1.2
PART-C	Q3	What is supply stream strategies? Write its classification and development guidelines..	15	CO3	L3	3.1
	Q4	What do you mean by Logistic Planning? Explain the function of Development of a Work Breakdown Structure.	15	CO3	L3	3.2
PART-D	Q5	What is the role of Coordination and technology in supply chain? Write the effect of lack of co-ordination and obstacles.	15	CO4	L4	4.1
	Q6	What are Operations Research Models for operational and strategic issues in supply chain management..	15	CO4	L4	4.2

********** END **********

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DEPARTMENT OF MECHANICAL ENGINEERING

"T3 Examination, Dec-2020"

SEMESTER	III	DATE OF EXAM	17/12/2022
SUBJECT NAME	ADVANCED OPTIMIZATION TECHNIQUES	SUBJECT CODE	MES602B
BRANCH	ME	SESSION	I
TIME	9.00 AM - 10.30 AM	MAX. MARKS	50
PROGRAM	M.TECH	CREDITS	1
NAME OF FACULTY	Pradeep Kr. Mouria	NAME OF COURSE COORDINATOR	Pradeep Kr. Mouria

Note: Attempt all questions.

	Q.NO.	QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A	1(A)	LP can be used for only production mix problems.	2	CO1	L1	1.1
	1(C)	In a production mix problem, one parameter we must know is the degree to which one resource may be substituted for another.	2	CO2	L2	2.1
	1(E)	Maximizing return on investment subject to a set of risk constraints is a popular financial application of LP.	2	CO3	L3	3.1
	1(G)	In linear programming formulation of the assignment problem, all constraint coefficients are equal to one.	2	CO1	L1	1.2
	1(I)	If a linear programming problem has alternate solutions, the order in which you enter the constraints may affect the particular solution found.	2	CO1	L1	1.2
	Q2	What are advanced optimization techniques? Give engineering application of them.	10	CO1	L1	1.3
PART-B	Q3	Explain Genetic Algorithm in detail.	10	CO2	L2	2.2
PA	Q4	Use the Kuhn-Tucker condition to solve the following NLPP:	10	CO3	L3	3.1

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RT -C		Minimize $Z=2X_1+3X_2-X_1^2-2X_2^2$ Subject to constraints $X_1+3X_2 \leq 6$ $5X_1+2X_2 \leq 10$ $X_1, X_2 \geq 0$				
PA RT -D	Q5	Define the Fibonacci number. What is the difference between Fibonacci and Golden section method.	10	CO4	L4	4.1
********** **END** **********						

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Set - I

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DEPARTMENT OF Mechanical Engineering

"END Term Examination, DEC.-2022"

SEMESTER	**3rd**	**DATE OF EXAM**	**15/12/2022**
SUBJECT NAME	**Fluid mechanics and Machines**	**SUBJECT CODE**	**MEH207B-T**
BRANCH	**B.TECH- ME (SMA)**	**SESSION**	**Morning**
TIME	**180 Minutes**	**MAX. MARKS**	**100**
PROGRAM	**B.TECH**	**CREDITS**	**04**
NAME OF FACULTY	**SANJAY TANEJA**	**HOD- ME**	

Note: Part A & B - All questions are compulsory. (10x2=20 marks)
***Part C & Part D*-Attempt two questions each from Part C and Part D. (4x20=80 marks)**

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A & B	Q1(A)	Differentiate between Steady and Unsteady flow.	2	CO1	BT2	1.4.1
	1(B)	Calculate the specific weight, density and specific gravity of 2 litres of a liquid which weighs 15 N.	2	CO1	BT3	1.3.1
	1(C)	Define the following and give one practical example for each (a) Turbulent flow (b) Laminar flow	2	CO1	BT1	1.3.1, 12.1.1
	1(D)	The diameter of a pipe at the section 1 and 2 are 15 cm and 20 cm respectively. Find the discharge through the pipe if velocity of water at section 1 is 4 m/s.	2	CO1	BT3	2.2.4
	1(E)	Define Newton law of viscosity.	2	CO1	BT2	1.4.1

	Q2(A)	What is Bernoulli theorem and write its assumptions also.	2	CO2	BT2	2.2.4
	2(B)	Define Overall and Hydraulic efficiency of Turbine.	2	CO2	BT2	2.3.2, 12.1.1
	2(C)	What is Darcy Weisbach equation?	2	CO2	BT2	2.3.1
	2(D)	What are the losses during fluid flow in pipes?	2	CO2	BT4	2.2.4
	2(E)	Define the importance of Reynold Number.	2	CO2	BT4	1.1.2
PART-C	Q3(A)	A Pelton wheel is having a mean bucket diameter of 1 meter and is running at 1000 r.p.m. The net head on the Pelton wheel is 700 meter. If the side clearance angle is 15 degree and discharge through nozzle is 0.1 cubic meter per second, Find (a) Power available at nozzle (b) Hydraulic efficiency of the turbine	10	CO4	BT3	2.3.1, 12.1.1
	(B)	Derive an expression for hydraulic efficiency of Pelton wheel turbine.	10	CO4	BT6	2.1.4
	Q4(A)	Explain working of Kaplan Turbine with neat sketch.	10	CO4	BT2	2.2.4, 12.1.1
	(B)	If a turbine develops 16000 W when running at 500 rpm. The head of the turbine is 50 meter. Determine the specific speed of the turbine and select a suitable turbine.	10	CO4	BT5	2.2.4
	Q5	A kaplan turbine develops 24647.6 KW power at an average head of 39 meters. Assuming a speed ratio 2.0, flow ratio of 0.6 and diameter of boss equal to 0.5 times of diameter of the runner and overall efficiency of the turbine is 90 %. Calculate the diameter, speed and specific speed of the turbine and also justify the selection of the turbine.	20	CO4	BT3,BT5	2.3.1
PART-D	Q6(A)	A centrifugal pump delivers water against a head of 14.5 meters and a design speed of 1000 r.p.m. The vanes are curved back to an angle of 30 degree with the periphery. The impeller diameter and width at outlet	10	CO3	BT3	2.3.1

		are 300 mm and 50 mm. Determine the discharge of the pump if manometric efficiency is 95 %.				
	(B)	Derive an expression for minimum starting speed of a centrifugal pump.	10	CO3	BT2	2.3.1
	Q7(A)	Explain working of Reciprocating pump with neat sketch.	10	CO3	BT2	2.3.1
	(B)	Describe the purpose of air vessel in reciprocating pump and also define its working with neat sketch.	10	CO3	BT2	1.1.2
	Q8	Write short notes on any four of the following. (1) Governing of turbine (2) Types of similarities (3) Manometric head (4) Draft tube (5) Slip, Negative slip	20	CO1,CO3, CO4	BT2,BT4	1.1.2

Set I

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DEPARTMENT OF Mechanical Engineering

"END Term Examination, DEC.-2022"

SEMESTER	**3rd**	**DATE OF EXAM**	**17/12/2022**
SUBJECT NAME	**Manufacturing Technology**	**SUBJECT CODE**	**MEH301B-T**
BRANCH	**B.TECH- ME (ME & SMA)**	**SESSION**	**Morning**
TIME	**180 Minutes**	**MAX. MARKS**	**75**
PROGRAM	**B.TECH**	**CREDITS**	**03**
NAME OF FACULTY	**SANJAY TANEJA**	**HOD- ME**	

Note: Part A & B - All questions are compulsory. (10x1.5=15 marks)
***Part C & Part D*-Attempt two questions each from Part C and Part D. (4x15=60 marks)**

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A & B	Q1(A)	List out all the steps of Casting process.	1.5	CO1	BT1	1.3.1
	1(B)	What are the advantages of Pattern?	1.5	CO1	BT1	1.3.1
	1(C)	What is Sweep pattern?	1.5	CO1	BT2	1.3.1, 12.1.1
	1(D)	What is the meaning of Cold-Shut defect in casting?	1.5	CO1	BT2	2.2.4
	1(E)	What considerations are necessary while designing a Pattern?	1.5	CO1	BT2	1.4.1
	Q2(A)	Define Resistance welding.	1.5	CO2	BT1	1.3.1
	2(B)	What is Spot welding?	1.5	CO2	BT1	1.3.1

	2(C)	What are the applications of TIG welding methodology?	1.5	CO2	BT2	2.2.4
	2(D)	What is Soldering? Define.	1.5	CO2	BT1	1.3.1
	2(E)	List out all the welding defects.	1.5	CO2	BT1	1.3.1
PART-C	Q3(A)	Differentiate between Hot working and Cold working with their applications.	8	CO3	BT3	2.2.4, 12.1.1
	(B)	Define Bending, Blanking and Punching operations with sketches.	7	CO3	BT3	2.2.4
	Q4(A)	What is Drawing operation? Explain its application by showing a figure.	8	CO3	BT3	2.2.4, 12.1.1
	(B)	Define Spinning and Embossing operations by giving suitable examples.	7	CO3	BT2	2.2.4
	Q5	What is the meaning of Extrusion process and also explain their advantages and disadvantages?	15	CO3	BT2,BT3	2.3.1
PART-D	Q6(A)	Explain working of Electrical discharge machining with neat sketch.	8	CO4	BT3	2.3.1
	(B)	Define applications of Laser beam machining and also explain its limitations.	7	CO4	BT4	2.3.1
	Q7	Explain working principle of Ultrasonic Machining process with neat sketch and also describe its application with advantages and disadvantages.	15	CO4	BT3	2.3.1
	Q8	Write short notes on any three of the following. (1) Shrinkage Allowance (2) Seam Welding (3) Abrasive jet Machining (4) Hot Extrusion (5) Castings defects	15	CO1,CO2, CO4	BT2,BT4	2.2.4, 12.1.1

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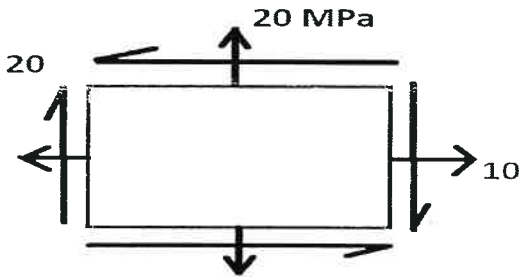
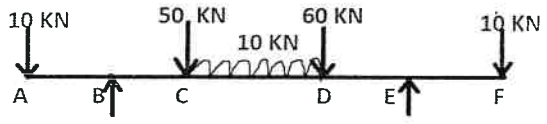
DEPARTMENT OF MECHANICAL ENGG.

"End Term Examination, Dec-2022"

SEMESTER	**3RD**	**DATE OF EXAM**	**19/12/2022**
SUBJECT NAME	**STRENGTH OF MATERIAL**	**SUBJECT CODE**	**MEH205B-T**
BRANCH	**MECHANICAL**	**SESSION**	**MORNING**
TIME	**3 Hrs.**	**MAX. MARKS**	**100**
PROGRAM	**B.TECH**	**CREDITS**	**5**
NAME OF FACULTY	**PRADEEP Kr. MOURIA**	**NAME OF COURSE COORDINATOR**	**PRADEEP Kr. MOURIA**

***Note** : All questions are compulsory.*

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL
PART-A	1(A)	Determine the magnitude and the direction of the principal stresses for the element shown below: 	10	CO1	L1
	1(B)	Draw the shear force and bending moment diagram of the beam shown below: 	10	CO2	L2

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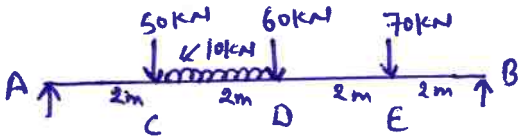
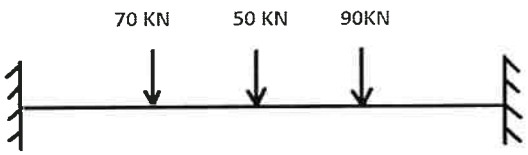
PART B	2	Find out the deflection at the different point of the beam shown below: 	20	C03	L3
	3	Drive the torsion formula for hollow and solid shaft.	20	C03	L4
PART-C	4	Draw the SFD and BMD of the fixed beam drawn below 	20	C04	L4
	5	Drive the Expression for Buckling force for the column having both end Fixed	20	C04	L4

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DEPARTMENT OF MECHANICAL ENGINEERING

"T3 Examination, Dec-2022"

SEMESTER	**3RD**	**DATE OF EXAM**	**21/12/2022**
SUBJECT NAME	**APPLIED THERMODYNAMICS**	**SUBJECT CODE**	**MEH204B-T**
BRANCH	**ME**	**SESSION**	**MORNING**
TIME	**3 HRS**	**MAX. MARKS**	**100**
PROGRAM	**B.TECH**	**CREDITS**	**4**
NAME OF FACULTY	**MR. PIYUSH MAHENDRU**	**NAME OF COURSE COORDINATOR**	**MR. PIYUSH MAHENDRU**

***Note**: All questions are compulsory from Section A & B. Attempt any two questions from Section C & D each. Steam Table can be used.*

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL
PART-A	1(A)	Explain the working of Economizer and Air Preheater.	05 Marks	CO2	BT3
	1(B)	Calculate the height of Chimney required to produce a draught equivalent to 1.7 cm of water if the flue gas temperature is 270^{0}C and ambient temperature is 22^{0}C and minimum amount of air per kg of fuel is 17 kg.	05 Marks	CO4	BT4
PART-B	Q2(A)	Dry saturated steam at 17.5 bar enters the turbine of a steam power plant and expands to the condenser pressure of 0.75 bar. Determine the Carnot and Rankine cycle efficiencies. Also find the work ratio of the Rankine cycle.	05 Marks	CO4	BT4
	2(B)	Draw the p-v & T-s diagram of Rehear Cycle. Also explain the process	05 Marks	CO3	BT3
PART-C	Q3 (A)	Show by graphical method, variation in the pressure and velocity of steam in an impulse turbine.	08 Marks	CO4	BT5
	3(B)	In a Da-Laval turbine, the blade angles are equal. The steam enters at a velocity of 300 m/s with a nozzle angle oil 6°. The blade friction factor is 0.84. If the blade speed and	12 Marks	CO3	BT4

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		steam speed ratio is 0.47, estimate I. blade efficiency; 2. Power developed for a mass flow rate of 2kg/s.			
	Q5(A)	Discuss the physical significance of Critical Pressure Ratio. Justify your answer with mathematical expression.	12 Marks	CO3	BT5
	5(B)	At a stage of a reaction turbine, the rotor diameter is 1.4 in speed ratio 0.7. If the blade outlet angle is 26° and the rotor speed 3000 r.p.m., find the blade inlet angle and Diagram efficiency. Also find the percentage increase in diagram efficiency and rotor speed. if the turbine is designed to run at the best theoretical speed.	08 Marks	CO4	BT4
	Q6(A)	Discuss the method of velocity compounding of an impulse turbine for achieving rotor speed reduction.	10 Marks	CO3	BT3
	6(B)	Steam turbine develops 185 kW with a consumption of *16.5* kg/kW/h. The pressure and temperature of the steam entering the nozzle are 12 bar and 220' C. The steam leaves the nozzle at 1.2 bar. The diameter of *the* nozzle at throat is 7mm, Find the number of nozzles.	10 Marks	CO4	BT4
PART-D	Q7(A)	Explain the working of Surface & Jet Condenser with suitable diagram.	12 Marks	CO3	BT3
	7(B)	With suitable diagram, explain the working of Reciprocating Compressor.	08 Marks	CO3	BT4
	Q8(A)	What is the effect of Intercooling in Multistage Compression process?	08 Marks	CO4	BT4
	8(B)	How the work input by the compressor is effective without clearance? Support your answer	12 Marks	CO4	BT4
	Q9(A)	Explain the working of Multi Stage Compression with suitable diagram.	08 Marks	CO3	BT5
	9(B)	Write short notes on: (i) Cooling Ponds (ii) Cooling Tower	12 Marks	CO3	BT3

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DEPARTMENT OF MECHANICAL ENGINEERING

"End Term Examination, Dec.-2022"

SEMESTER	**5th**	**DATE OF EXAM**	**09th Dec. 2022**
SUBJECT NAME	**Heat Transfer**	**SUBJECT CODE**	**MEH303B-T**
BRANCH	**ME-SMA**	**SESSION**	**2022-23 (I)**
TIME	**09.00 AM to 12.00 PM**	**MAX. MARKS**	**100**
PROGRAM	**B.Tech**	**CREDITS**	**04**
NAME OF FACULTY	**GIANENDER KAJAL**	**NAME OF COURSE COORDINATOR**	**GIANENDER KAJAL**

***Note**: All questions are compulsory. Questions will be of descriptive type or numerical.*

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART (A)	1(A)	Derive a general expression for the three-dimensional heat transfer equation in cylindrical coordinate system.	05	CO1	BT3	12.2.1
	1(B)	Distinguish between steady-state conduction and unsteady state conduction.	05	CO1	BT2	12.3.1
PART (B)	2(A)	The inner surface of a plane brick wall is at 60°C, and the outer surface is at 35°C. Calculate the rate of heat transfer per m2 of surface area of the wall, which is 220 mm thick. The thermal conductivity of the brick is 0.51 W/m°C.	05	CO2	BT2,3	10.3.1
	2(B)	Derive a general expression for heat conduction through plane wall and also represent it as electrical resistance.	05	CO2	BT3	1.1.2
PART (C)	3(A)	What is meant by critical thickness of insulation? How it is calculated in case of spherical?	10	CO3	BT2,3	10.3.1
	3(B)	Distinguish between: (i) Black body and white body (ii) Absorptivity and emissivity of a surface	10	CO3	BT3	12.3.1

	3(C)	Define Reynolds, Nusselt and Prandtl numbers and discuss their significance in convective heat transfer.	10	CO3	BT2	1.1.2
	3(D)	Explain what do you mean by absorptivity, reflectivity, and transmissivity. Also explain the following terms: Thermal conductivity, Thermal resistance, Thermal diffusivity.	10	CO3	BT3	10.3.1
PART (D)	4(A)	Derive an expression for log mean temperature difference of counter flow heat exchanger.	10	CO4	BT5	12.2.1
	4(B)	Write explanatory notes on any two: a) Planck Distribution law b) Kirchoff Law	10	CO4	BT3	1.1.2
	4(C)	Define the effectiveness of heat exchanger. Derive the equation for counter flow heat exchanger using NTU method.	10	CO4	BT3	10.3.1
	4(D)	Differentiate between mechanism of heat transfer by free and forced convection. Mention some of the areas where these mechanisms are predominant.	10	CO4	BT5	1.1.2

********** END **********

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DEPARTMENT OF MECHANICAL ENGINEERING

"End Term Examination, Dec-2022"

SEMESTER	**5th**	**DATE OF EXAM**	**12/12/2022**
SUBJECT NAME	**COMPUTER AIDED DESIGN & MANUFACTURING**	**SUBJECT CODE**	**MEH318B-T**
BRANCH	**ME-SMA**	**SESSION**	**I**
TIME	**3 Hrs.**	**MAX. MARKS**	**75**
PROGRAM	**B.Tech.**	**CREDITS**	**3**
NAME OF FACULTY	**Dr. Prashant Bhardwaj**	**HOD Signature**	

Note: All questions are compulsory.

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL
PART-A	1(A)	What are the advantages of wireframe modelling over other techniques?	7	CO1	BT2
	1(B)	Discuss the batch and job shop production system?	8	CO2	BT3
PART-B	Q2 (a)	Differentiate between NC, CNC & DNC?	8	CO3	BT3
	Q2 (b)	Explain about four types of APT Statements?	7	CO3	BT3
	Q3 (a)	Write a manual part program for finishing a component as shown in figure below. Assume suitable feed, speed and other required parameters.	15	CO3	BT5

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Department Of Mechanical Engineering

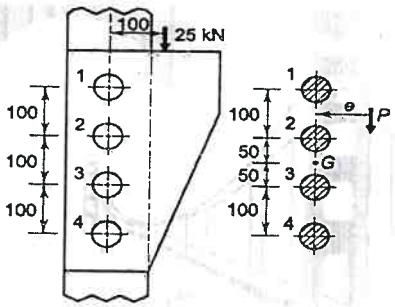
"END TERM EXAMINATIONS, Dec-2022"

SEMESTER	**5th**	**DATE OF EXAM**	**14.12.2022**
SUBJECT NAME	**MACHINE DESIGN-I**	**SUBJECT CODE**	**MEH302B**
BRANCH	**ME-SMA**	**SESSION**	**Morning**
TIME	**09.00AM-12.00NOON**	**MAX. MARKS**	**100**
PROGRAM	**B.TECH**	**CREDITS**	**04**
NAME OF FACULTY	**Nazish Ahmad Shamsi**	**NAME OF COURSE COORDINATOR**	**Nazish Ahmad Shamsi**

Note: ***Part A:*** *All questions are compulsory.*

Part B & C: *Questions will be of descriptive type or numerical. Each question will be of 20 Marks. Attempt any two questions. Assume Missing data if any.*

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A	1(A)	A machine element is subjected to the following stresses σ_x = 60 MPa, σ_y = 45 MPa, t_{xy} = 30 MPa. Find the factor of safety if it is made of C45 steal having yield stress as 353 MPa, using the following theories of failure. (i) Maximum principal stress theory. (ii) Maximum shear stress theory.	05	CO1	BT3	1.3.1
	1(B)	Give a brief account on Limits, Fits and Tolerances used in Design of a component.	05	CO1	BT2	1.4.1
	2(A)	Discuss the types of shafts used along with their application.	05	CO2	BT1	1.4.1
	2(B)	What are the various types of keys used? Also state their advantages.	05	CO2	BT1	1.3.1
PART-B	Q3(A)	Derive the relation for strength of transverse and parallel fillet welded joint.	20	CO3	BT4	2.3.1,12.1.1
	Q3(B)	A bracket attached to a vertical column by means of 4 identical rivets as shown in figure below, is subjected to an eccentric force of 25kN. Determine the diameter of rivets, if permissible shear stress is 60 N/mm^2.	20	CO3	BT5	2.2.4

						
	Q3(C)	Discuss in detail the types of joints usually seen in mechanical components.	20	CO3	BT2	1.3.1,2.2.4
PART-C	Q4(A)	Write a short Notes on: (i) Discuss the advantages of disc brakes over drum brakes. (ii) What is an ABS and what are its advantages. (iii) Desirable properties for the material of clutch. (iv) Name different types of clutches used along with their practical application.	5*4	C04	BT2	1.3.1,2.2.4
	Q4(B)	Derive the relation by using proper notations for velocity of a belt for maximum power to be transmitted.	20	C04	BT4	2.3.2,12.1.1
	Q4(C)	What are Flexible derives. Discuss their advantages and disadvantages over other derives in detail.	20	C04	BT3	2.3.1,12.1.1

********** END **********

DEPARTMENT OF MECHANICAL ENGINEERING

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"T3 Examination, Dec-2022"

SEMESTER	**5th**	**DATE OF EXAM**	**21/12/2022**
SUBJECT NAME	**MECHATRONICS**	**SUBJECT CODE**	**MEH319B-T**
BRANCH	**Mechanical-SMA**	**SESSION**	**Morning**
TIME	**09.00AM-12.00 NOON**	**MAX. MARKS**	**100**
PROGRAM	**UG**	**CREDITS**	**4**
NAME OF FACULTY	**Dr. Ajit**	**NAME OF COURSE COORDINATOR**	**Dr. Ajit**

***Note**: Part A & B : All questions are compulsory. Attempt any 4 questions from Part C and Part D. Questions will be of descriptive type or numerical.*

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A	1(A)	With a block diagram, show multidisciplinary scenario in mechatronics.	5	CO1	BT2	12.2.11 2.2.2
	1(B)	What are the requirements of a sensors and actuators in control system.	5	CO1	BT1	12.3.1
PART-B	Q2(A)	Show that the gauge factor of strain gauge depends on poisson's ratio.	5	CO2	BT3	10.3.1
	2(B)	What are the difference between robotics and mechatronics system?	5	CO2	BT4	12.3.1
PART-C	3(A)	Identify the various elements and levels of mechatronics system.	10	CO3	BT4	3.1.4
	3(B)	Apply the LVDT as secondary sensing element in a measurement system with its working.	10	CO3	BT4	10.3.11 2.1.1
	3(C)	Draw a block diagram of Programmable Logic Controller (PLC) showing in very general terms the main units of it.	10	CO4	BT2	1.1.2
	3(D)	What is an operational amplifier, explain in details the different types of op-amp.	10	CO4	BT3	12.2.1

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	Q3(E)	Explain briefly the difference between microprocessor and microcontroller.	10	CO4	BT3	12.2.1
PART-D	Q4(A)	Define a mechatronic product and explain social and economical impacts of mechatronics products.	10	CO3	BT4	12.2.11 2.2.2
	Q4(B)	List the important features of smart sensors. Describe the construction and uses of different proximity switches.	10	CO3	BT3	10.3.1
	Q4(C)	What is a microcontroller? What are the advantages of PLC compared to a microcontroller?	10	CO4	BT4	12.2.11 2.2.2
	Q4(D)	A pressure indicator showed a reading as 42 bar on a scale range of 0-50 bar. If the true value was 41.4 bar, determine (1) static error (2) Relative error	10	CO4	BT3	10.3.1
	Q4(E)	State the basic principles involved in the action of a motor.	10	CO3	BT3	10.3.1

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Department Of Mechanical Engineering

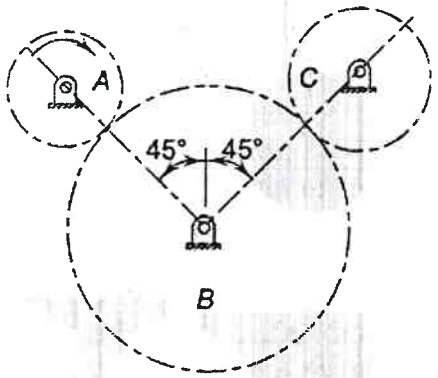
"END TERM EXAMINATIONS, Dec-2022"

SEMESTER	**7th**	**DATE OF EXAM**	**12.12.2022**
SUBJECT NAME	**MACHINE DESIGN-II**	**SUBJECT CODE**	**MEH402B**
BRANCH	**ME-SMA**	**SESSION**	**Morning**
TIME	**09.00AM-12.00NOON**	**MAX. MARKS**	**100**
PROGRAM	**B.TECH**	**CREDITS**	**04**
NAME OF FACULTY	**Nazish Ahmad Shamsi**	**NAME OF COURSE COORDINATOR**	**Nazish Ahmad Shamsi**

Note: ***Part A:*** *All questions are compulsory.*

Part B & C: *Questions will be of descriptive type or numerical. Each question will be of 20 Marks. Attempt any two questions. Assume Missing data if any.*

	Q.NO.	QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART-A	1	Discuss the following terms in brief: A) Concurrent engineering. B) Stages observed in creep deformation of a component.	5*2	CO1	BT1	1.3.1
	2	A ball bearing has a dynamic load capacity of 40500 N and operates on the following work cycle:- i) Radial load 4500N at 500rpm for 25% of the time. ii) Radial load of 3260N at 900rpm for 50% of the time. iii) Radial load of 5500N at 400rpm for 25% of the time. Calculate the life of the bearing in hours.	10	CO2	BT3	1.4.1
PART-B	Q3(A)	Determine the required no. of coils and permissible deflection in a helical spring made of steel wire with diameter 1.6 mm; assuming spring index of 6 and allowable stress of 345MN/m^2 in shear. The spring rate is 1800N/m.	20	CO3	BT4	2.3.1,12.1.1
	Q3(B)	Define Nipping in Leaf spring. Also derive the relation for nipping in leaf spring and initial pre load required to overcome over it by using suitable notations.	20	CO3	BT4	2.2.4

	Q3(C)	Writ short notes on: (i) Various types of springs. (ii) Factors for selecting spring materials. (iii) Series and parallel combinations of springs. (iv) Failure of springs.	5*4	CO3	BT2	1.3.1,2.2.4
PART-C	Q4(A)	A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 40 teeth gear. The helix angle is 25° and the normal pressure angle is 20°. The normal module is 3 mm. Calculate (i) the transverse module; (ii) the transverse pressure angle; (iii) the axial pitch; (iv) the pitch circle diameters of the pinion and the gear; (v) the center distance;	20	C04	BT3	1.3.1,2.2.4
	Q4(B)	The pitch circles of a train of spur gears are shown below. Gear A receives 3.5 kW of power at 700 rpm through its shaft and rotates in the clockwise direction. Gear B is the idler gear while the gear C is the driven gear. The no. of teeth on gear A, B and C are 30, 60, and 40 respectively and the module is 5. Calculate: i) the torque on each gear shaft. (ii) The components of gear tooth forces (iii) Draw free body diagram of forces and determine the reactions on the idler gear shaft assume 20° involutes system for the gears.  	20	C04	BT5	2.3.2,12.1.1
	Q4(C)	Write a short Note on: (i) Types of gear tooth failure usually occurs. (ii) Compare between the Bevel gear and helical gear. (iii) What are the advantages of using gear drives? (iv) Properties of gear material.	5*4	C04	BT2	2.3.1,12.1.1

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DEPARTMENT OF MECHANICAL ENGG.

"End Term Examination, Dec-2022"

SEMESTER	**7th**	**DATE OF EXAM**	**12/12/2022**
SUBJECT NAME	**SOM-ii**	**SUBJECT CODE**	**MEH306B**
BRANCH	**MECHANICAL**	**SESSION**	**MORNING**
TIME	**3 Hrs.**	**MAX. MARKS**	**100**
PROGRAM	**B.TECH**	**CREDITS**	**5**
NAME OF FACULTY	**PRADEEP Kr. MOURIA**	**NAME OF COURSE COORDINATOR**	**PRADEEP Kr. MOURIA**

Note : All questions are compulsory.

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL
PART-A	1(A)	Explain Different T.O.F	10	CO1	L1
	1(B)	Drive the expression for hoop, longitudinal stress and strain in thin cylinder. Also find out volumetric strain.	10	CO2	L2
PART-B	2	A steel cylindrical pressure vessel with closed ends is 25 cm external diameter and 5 mm thick. It is wound closely with a single layer of circular section steel wire of 1.2 mm diameter under tension of 96MN/m². If the cylinder is treated as thin, calculate (a) the initial stress in the cylinder,(b) the initial pressure which will produce a stress of 48 MN/m², and (c) stress in the wire under these condition. Poisson's ratio = 0.30.	20	CO3	L3
	3	A tube 8 cm inside and 12 cm outside diameter is to be reinforced by shrinking on a second tube of 16 cm outside diameter. The compound tube is to withstand an internal pressure of 35Mpa and the shrinkage allowance is to be such that the final maximum stress in each tube is to be same. Calculate the stress and show on a diagram the variation of hoop stress	20	CO3	L4

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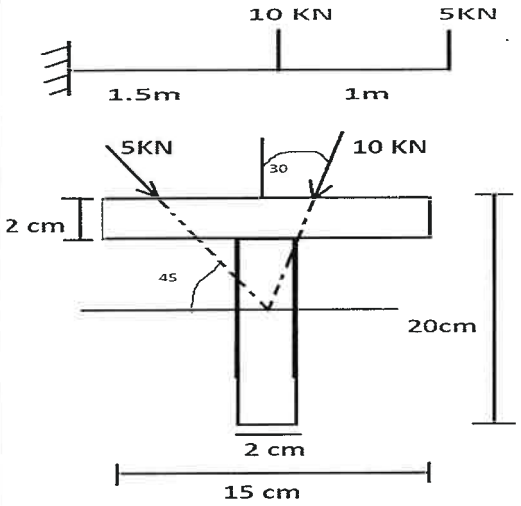
		in the two tubes. What is the initial difference of diameters before shrinking on? Take E= 200GPa.			
PART-C	4	A cantilever beam of I section is used to support the loads inclined to the V-axis as shown in fig. Calculate the stresses at the corners A, B, C and D. Also locate the neutral axis. 	20	C04	L4
	5	Drive the formula for hoop and radial stresses for rotating cylinder.	2*10	C04	L4

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DEPARTMENT OF MECHANICAL ENGINEERING

"T3 Examination, Dec-2022"

SEMESTER	**7th**	**DATE OF EXAM**	**19/12/2022**
SUBJECT NAME	**Heating, Ventilation & Air Conditioning**	**SUBJECT CODE**	**MEH409B-T**
BRANCH	**ME**	**SESSION**	**Morning**
TIME	**9 AM to 12 Noon**	**MAX. MARKS**	**100**
PROGRAM	**B.Tech**	**CREDITS**	**3**
NAME OF FACULTY	**Mr. Piyush Mahendru**	**NAME OF COURSE COORDINATOR**	**Mr. Piyush Mahendru**

Note: Part A & Part B: All questions are compulsory. Part C & D: Questions will be of descriptive type or numerical. Each question will be of 20 *marks. Attempt any four questions from both parts.*

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL
PART-A	Q1	Explain Summer and Winter Air Conditioning System Cycle.	10	CO1	BT3
PART-B	Q2	An air conditioned room that stands on a well ventilated basement measures 3 m wide, 3 m high and 6 m deep. One of the two 3 m walls faces west and contains a double glazed glass window of size 1.5 m by 1.5 m, mounted flush with the wall with no external shading. There are no heat gains through the walls other than the one facing west. Calculate the sensible, latent and total heat gains on the room, room sensible heat factor from the following information. What is the required cooling capacity? (10) Inside conditions: 24°C dry bulb, 50 percent RH Outside conditions: 44°C dry bulb, 26°C wet bulb U-value for wall: 1.78 W/m2.K U-value for roof: 1.34 W/m2.K	10	CO2	BT4

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		U-value for floor: 1.2 W/m2.K Effective Temp. Difference (ETD) for wall: 25°C Effective Temp. Difference (ETD) for roof: 29°C U-value for glass; 3.12 W/m2.K Solar Heat Gain (SHG) of glass; 298 W/m2 Internal Shading Coefficient (SC) of glass: 0.86 Occupancy: 4 (90 W sensible heat/person) (40 W latent heat/person) Lighting load: 33 W/m2 of floor area Appliance Load= 600 W (Sensible) + 300 W (Latent) Infiltration= 0.5 Air Changes per Hour Barometric Pressure- 101 KPa			
PART-C	Q3	Explain the working principle of Direct and Indirect Evaporative Cooling System.	20	CO3	BT3
	Q4	What is Air Handling Unit? Explain the working principle of AHU	20	CO3	BT4
	Q5	A building has to be maintained at 21°C(Dry bulb) and 50% relative humidity when the outside condition is -30oC(Dry bulb) and 100% relative humidity. The inner and outer surface heat transfer coefficients are 8.3 W/m2K and 34.4 W/m2K respectively. A designer chooses an insulated wall that has a thermal resistance (R-value) of 0.3 W2.K/W. Find whether the wall insulation is sufficient to prevent the condensation of moisture of the surface. If the chosen R-value of the wall can lead to condensation, what should be the minimum thickness of additional insulation (thermal conductivity 0.036 W/m.K.) required to prevent condensation. Take the barometric pressure is 101 KPa.	20	CO3	BT4
PART-D	Q6	Explain the working principle with suitable diagrams, advantages and disadvantages of air water system and unitary refrigerant based system.	20	CO4	BT3
	Q7	The following figure shows a typical duct layout. Design the duct system using a) Velocity method. Take the velocity of air in the main duct (A) as 8 m/s. Assume a dynamic loss coefficient of 0.3 for upstream to downstream and 0.8 for upstream to branch and for the elbow. The dynamic loss coefficients for the outlets may be taken as 1.0. Find the FTP required for each case and the amount of dampering required.	20	CO4	BT5

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		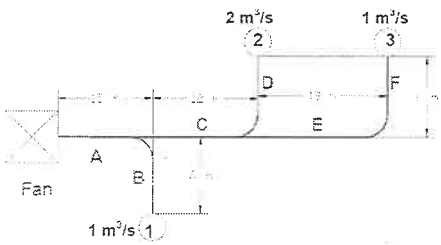			
	Q8	Discuss airflow through air conditioning ducts, Bernoulli and modified Bernoulli equations, Static, dynamic, datum and total head, Fan Total Pressure (FTP) and power input to fan.	20	CO4	BT3

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DEPARTMENT OF MECHANICAL ENGG.

"End Term Examination, Dec-2022"

SEMESTER	**7th**	**DATE OF EXAM**	**19/12/2022**
SUBJECT NAME	**Optimization Technique**	**SUBJECT CODE**	MEH406B-T
BRANCH	**MECHANICAL**	**SESSION**	**MORNING**
TIME	**3 Hrs.**	**MAX. MARKS**	**100**
PROGRAM	**B.TECH**	**CREDITS**	**5**
NAME OF FACULTY	**PRADEEP Kr. MOURIA**	**NAME OF COURSE COORDINATOR**	**PRADEEP Kr. MOURIA**

Note : All questions are compulsory.

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL
PART-A	1(A)	Solve the transportation problem using VAM. 1 | 2 | 1 | 4 | Demand30 3 | 3 | 2 | 1 | 50 4 | 2 | 5 | 9 | 20 Supply-20 | 40 | 30 | 10 | 100/100	10	CO1	L1
	1(B)	Find out the optimum solution of above problem using MODI method.	10	CO2	L2
PART-B	2	Find out the maximum and minimum objective of the assignment problem. 62 | 78 | 50 | 101 | 82 71 | 84 | 55 | 73 | 59 87 | 92 | 111 | 71 | 81 48 | 64 | 87 | 77 | 80	20	CO3	L3
	3	Using simplex method solve the problem $Z_{max} = 4X_1 + X_2 + 3X_3 + 5X_4$; Subjected to $4X_1 - 6X_2 - 5X_3 + 4X_4 \geq -20$; $3X_1 - 2X_2 + 4X_3 + X_4 \leq 10$; $8X_1 - 3X_2 + 3X_3 + 2X_4 \leq 20$; $X_1, X_2, X_3, X_4, \geq 0$	20	CO3	L4

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	4	Explain Genetic Algorithm in detail.	20	C04	L4
	5	(a) What are Fibonacci number and how they obtained? (b) Explain Golden Section method	2*10	C04	L4

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