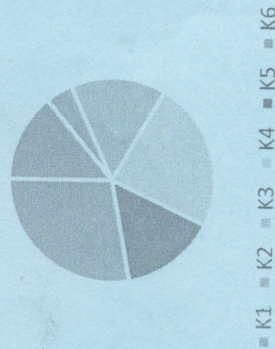


CO- Course Outcomes, **KL-** Knowledge Level, **PO** – Program Outcome

CO1	Identify the various types of cutting tools, mechanics of metal cutting, tool materials.
CO2	Explain the concepts and derive the relationships for shear plane angle, cutting forces, tool life criterion, and effective utilization of the tools, towards decision making processes illustrate them
CO3	Classify and analyze the different dynamometers for measuring forces considering Case studies –Draw conclusions
CO4	Understand the importance of non-traditional machining over traditional machining process
CO5	Decide the best hybrid process and take appropriate decision for live problems faced in the industries especially for machining operations

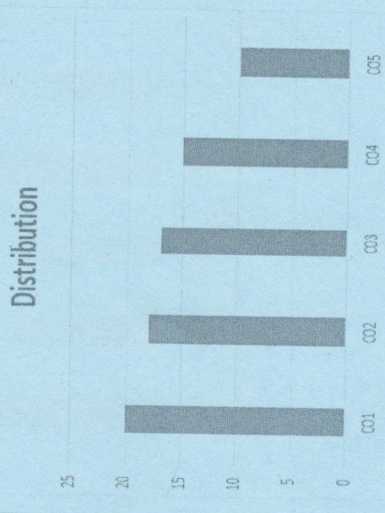
GRAFICAL REPRESENTATION

Bloom's Level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome Wise Marks Distribution



ARKAJAIN University Jharkhand		END TERM EXAMINATION School of Engineering & IT	
Branch	Manufacturing Engineering	Program	M. Tech
Subject Name	Fundamentals of Metal cutting and NTM	Semester	1
		Year	Feb/2024
<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers.</u> 			
Time: 3 Hour			
Max. Marks : 70			
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to Q1-x) – 20 Marks

Q. N1	QUESTIONS	Marks	COs	KL	PO
i	An object is machined to a) Fulfill its functional requirement b) Provide desirably good performance c) Render longer service life d) All of the above.	2	CO1	K1	PO2
ii	Rapid prototyping is a a) Joining process b) Removal process c) Regenerative manufacturing process d) Finishing process.	2	CO2	K1	PO2
iii	A cutting tool can never have its a) Rake angle – positive b) Rake angle – negative c) Clearance angle – positive d) Clearance angle – negative	2	CO2	K2	PO3
iv	Back rake of a turning tool is measured on its a) Machine longitudinal plane b) Machine transverse plane c) Orthogonal plane d) Normal plane	2	CO1	K2	PO2
v	Shaping grey cast iron block will produce a) Continuous chip with BUE b) Continuous chip without BUE c) Discontinuous chip of irregular size & shape	2	CO3	K2	PO2

Section C (Answer any THREE out of FIVE) - 30 Marks-
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Explain the tool nomenclature of single point cutting tool in ASA system.	10	CO1	K1	PO1
9	Explain the mechanism of chip formation with suitable diagram.	10	CO2	K3*	PO2
10	What do you understand by tool wear? Explain types of tool wear.	10	CO3	K3	PO1
11	Explain the Abrasive Jet Machining Process with suitable diagram.	10	CO4	K4	PO2
12	Explain working principle, elements, advantages, limitation and application areas of Electro-Discharge machining (EDM) Process.	10	CO5	K5	PO2

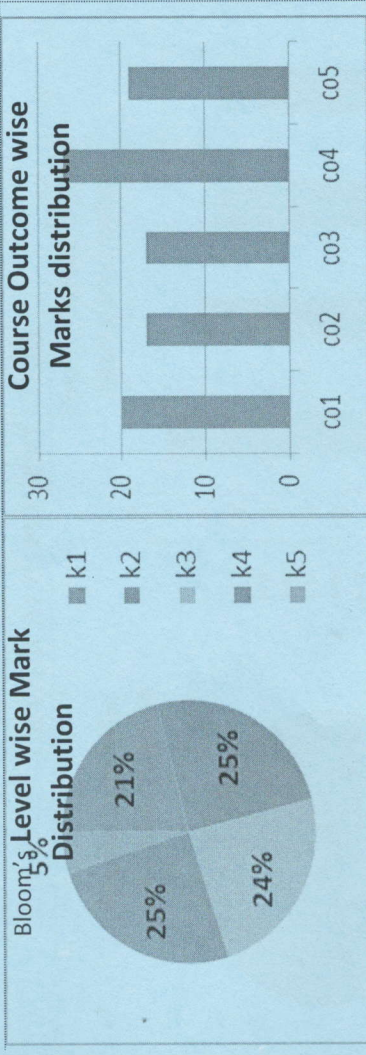
vi	d) Discontinuous chip of regular size & shape Ultrasonic Machining (USM) can be classified as the following type of non-traditional machining process a) Electrical b) Optical c) Mechanical d) Chemical	2	CO3	K3	PO3
vii	Continuous chips are formed during metal cutting operation due to a) Ductile work materials b) Large rake angle c) High cutting speed d) All of the above	2	CO2	K3	PO2
viii	The built up edge in cutting tools can be eliminated by a) Fast cutting speed b) Higher rake angles c) High pressure cutting fluid d) All of the above	2	CO2	K4	PO3
ix	Milling can be a _____ operation. a) Gear cutting operation b) Machining operation c) Slotting d) All of them	2	CO2	K2	PO3
x	Arbor is a _____ holding device. a) Work b) Tool c) Both Work & Tool d) None	2	CO4	K3	PO3


Section B (Answer any FOUR out of SIX) - 20 Marks
(Each question 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Justify "Machining is a value addition process".	5	CO1	K2	PO1
3	Write a note on different types of cutting tool materials.	5	CO2	K1	PO2
4	What do you understand by tool life? Explain the tool life with help of Taylor's tool life equation.	5	CO3	K3	PO1
5	Write difference between traditional and non-traditional machining.	5	CO4	K2	PO2
6	Classify the different non-traditional machining process and also comment on their process capabilities.	5	CO5	K3	PO2
7	What is the role of cutting fluid in machining? Enlist them.	5	CO3	K3	PO1

CO1	Understand the concept of JIT, types, their principles, economics and applications.
CO2	Know the implementation and production of different types of JIT for manufacturing systems.
CO3	Understand the concepts of Kanban system implemented in Toyota.
CO4	Understand the process of Scheduling and Sequencing.
CO5	Learn and understand the concept of production planning, production smoothing and demand fluctuation.

GRAPHICAL REPRESENTATION





ARKAJAIN
University
Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	Manufacturing Engineering	Program	M. Tech
Subject Name	Advanced Management Techniques in Manufacturing	Semester	I
		Year	Feb/2024

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; don't write on the 1st Page Backside
- Answer all Questions of Section A (Compulsory)
- Answer Any Four out of Six of Section B
- Answer Any Three out of Five of Section C
- Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will come under **Unfair Means** and will **Result** in the **Cancellation of the Papers.**

Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Q. N1	QUESTIONS	Marks	COs	KL	PO
i	Factors affecting Production Design includes _____ and _____ perspectives. a. Customer & price b. Customer & production c. Customer & organisation d. Quality & quantity	2	CO1	K1	PO2
ii	What is the purpose of a control chart? a. To track the performance of a process over time b. To identify the root cause of defects c. To determine the cost of defects d. To evaluate customer satisfaction	2	CO3	K2	PO2
iii	Which of the following is not a type of inspection? a. Attribute sampling b. Variable sampling c. Acceptance sampling d. Discrete sampling	2	CO1	K2	PO2
iv	_____ is one of the objective of Production Management. a. Right person b. Right cost c. Right quantity d. Continuous process	2	CO2	K1	PO4
v	According to Deming, Quality problems are a. Due to management b. Due to method c. Due to machine d. Due to material	2	CO1	K1	PO2

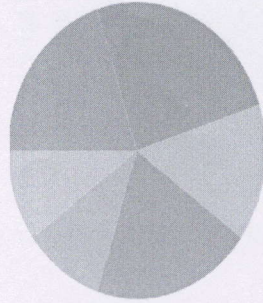
vi	Production planning and control function is crucial for ensuring efficiency and cost savings in a. Planning c. Promotion _____ system is one of the types of Production System. a. Non-flow c. Assembly lines Just-in-Time was successfully implemented by a. Honda c. Suzuki Production Planning is necessary for a. Inventory Management b. Quality Management c. Supply Management d. All of the above Which of the following means 'Ready-Set-Go' a. Yo-i-don c. Taiichi Ohno	2	CO5	K2	PO2
vii	b. Production d. None of the above	2	CO5	K3	PO2
viii	b. Intermittent d. Periodical	2	CO1	K2	PO4
ix	b. Toyota d. Volkswagen	2	CO1	K2	PO2
x		2	CO4	K3	PO4
Section B (Answer any FOUR out of SIX) – 20 Marks (Each question 5 Marks)					
Q.No.	QUESTIONS	Marks	COs	KL	PO
2	Explain 5S in Organization.	5	CO4	K3	PO3
3	What are the various key Principles of Operation Management in Manufacturing?	5	CO1	K2	PO2
4	Explain the terms 'Heijunka', Jidoka, and Kaizan.	5	CO1	K4	PO2
5	Elaborate "Profit through Cost Reduction".	5	CO5	K1	PO2
6	What are the various Wastes in production system? Describe them.	5	CO3	K5	PO4
7	What types of Companies Uses JIT? Who Invented Inventory Management? How JIT is beneficial in production system?	5	CO 2	K3	PO1
Section C (Answer any THREE out of FIVE) – 30 Marks- (Each question Carry 10 Marks)					
Q.No.	QUESTIONS	Marks	COs	KL	PO
8	Elaborate the application of Robots and CAD in Production line.	10	CO4	K4	PO1
9	Describe KANBAN System in details.	10	CO5	K4	PO2

10	Describe QC Circles. What is the structure of QC Circle?	10	CO4	K1	PO2
11	What is Lean Manufacturing? Describe it.	10	CO1	K3	PO3
12	What makes Toyota Production System (TPS) best in the Industry? Describe it.	10	CO2	K2	PO4

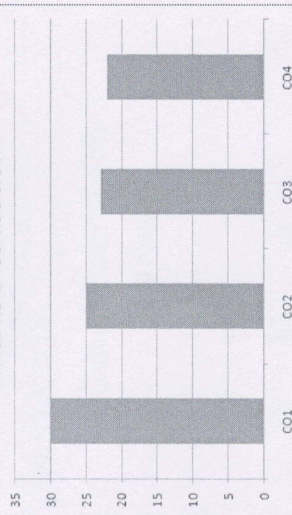
CO1	Apply the gained Knowledge in the field of material and to differentiate properties with respect to conventional material
CO2	Select suitable powder production methods for different materials in order to get the required components.
CO3	Select suitable production technique for composite material.
CO4	Analyse and obtain stiffness and compliance matrix and also study strength parameters of lamina.

GRAPHICAL REPRESENTATION

Blooms Level wise marks Distribution



Course Outcome Wise Marks Distribution



Branch	Manufacturing Engineering	Program	M.Tech
Subject Name	Advanced Material Technology	Semester	I
		Year	Feb/2024
Time: 3 Hour Max. Marks : 70	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will comes under Unfair Means and will Result in the Cancellation of the Papers. 		
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to Q1-x) – 20 Marks

Q. N1	QUESTIONS	Marks	COs	KL	PO
i	Young's modulus is defined as the ratio of a. Volumetric stress and volumetric strain b. Lateral stress and lateral strain c. Longitudinal stress and longitudinal strain d. Shear stress to shear strain	2	CO1	K1	PO 2
ii	Within elastic limit, stress is a. Inversely proportional to strain b. Directly proportional to strain c. Square root of strain d. Equal to strain	2	CO1	K1	PO 2
iii	The deformation per unit length is called a. Tensile stress b. Compressive stress c. Shear stress d. Strain	2	CO2	K4	PO 3
iv	Modulus of rigidity is defined as the ratio of a. Longitudinal stress to longitudinal strain b. Volumetric stress to volumetric strain c. Lateral stress to Lateral strain d. Shear stress to shear strain	2	CO3	K2	PO 3
v	The rivets are used for _____ fastenings. a. Permanent b. Temporary c. Semi-permanent d. None of these	2	CO2	K4	PO 4

vi	The materials which exhibit the same elastic properties in all directions are called a. Homogeneous b. Inelastic c. Isotropic d. Isentropic	2	CO3	K5	PO4
vii	Shear modulus is the ratio of a. Linear stress to linear strain b. Linear stress to lateral strain c. Volumetric strain to linear strain d. Shear stress to shear strain	2	CO2	K2	PO3
viii	Up to which point on the stress-strain curve is Hooke's law valid? a. Elastic limit b. Yield point c. Proportionality limit d. Fracture point	2	CO3	K3	PO4
ix	What is the unit for stress? a. N/m ² b. Nm ² c. N/m d. Nm	2	CO4	K4	PO3
x	Strain is a dimensionless quantity. a. True b. False	2	CO4	K4	PO3

SECTION B (ANSWER ANY FOUR OUT OF SIX) - 20 MARKS
(EACH QUESTION 5 MARKS)

Q. No.	QUESTIONS	Marks	COS	KL	PO
2	List out the name of different properties of materials.	5	CO1	K2	PO3
3	Elaborate processing of composite with suitable examples	5	CO1	K3	PO2
4	Explain Different Steps Involved in powder metallurgy with suitable examples.	5	CO2	K4	PO3
5	Differentiate Metal matrix Composites (MMC) and Ceramic Matrix Composites (CMC)	5	CO2	K4	PO4
6	Elaborate classification of engineering materials with examples.	5	CO3	K4	PO3
7	Elaborate Titanium, Nickel, Cobalt and its alloys with suitable examples and applications	5	CO4	K5	PO4

SECTION C (ANSWER ANY THREE OUT OF FIVE) - 30 MARKS
(EACH QUESTION 10 MARKS)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Elaborate Metal matrix Composites (MMC) with suitable diagram	10	CO2	K5	PO3

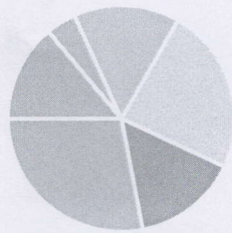
9	Explain any one of powder metallurgy Process with suitable examples.	10	CO1	K2	PO4
10	Explain any 5 types of Engineering materials properties with ASTM Test procedure.	10	CO3	K3	PO3
11	Differentiate Metal and Alloy with examples, Write down the name of different types of composite materials	10	CO4	K5	PO4
12	Differentiate Thermosetting and Thermoplastic with examples. Explain processing methods of Polymer.	10	CO4	K1	PO5

CO- Course Outcomes, **KL-** Knowledge Level, **PO** – Program Outcome

CO1	Learn about a working principle and construction of Additive Manufacturing	PO – Program Outcome
CO2	Apply Knowledge to support design and manufacturing, modern development in additive manufacturing process	
CO3	Assess and implement AM techniques for specific application leading to better ROI for the company that uses Laser AM machines	
CO4	Enhance the production sequence of tooling process by choosing the correct material for the job	
CO5	Develop and incorporate the productivity sequence by choosing the right AM technology	

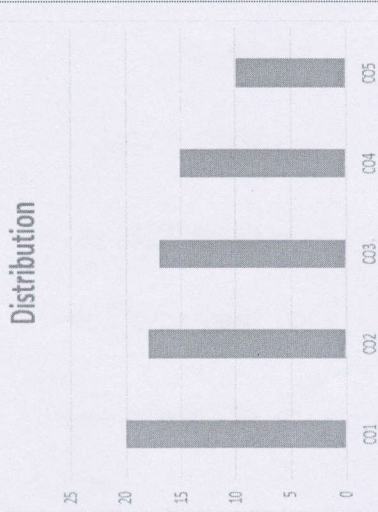
GRAPHICAL REPRESENTATION

Bloom's Level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome Wise Marks Distribution



ARKAJAIN University
Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch: Manufacturing Engineering
Program: M. Tech
Subject Name: Additive Manufacturing
Semester: 1
Year: Feb/2024

- Time: 3 Hour
Max. Marks : 70
- Start writing from 2nd page onwards; don't write on the 1st Page Backside
 - Answer all Questions of Section A (Compulsory)
 - Answer Any Four out of Six of Section B
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 - Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will come under Unfair Means and will Result in the Cancellation of the Papers.

Knowledge Level (KL)
K1 : Remembering
K2 : Understanding
K3 : Applying
K4 : Analysing
K5 : Evaluating
K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to Q1-x) – 20 Marks

Q.N1	QUESTIONS	Marks	COs	KL	PO
i	Which of the following is typically the cheapest type of 3D printer? a) FDM b) SLA c) Powder-based d) SLM	2	CO1	K1	PO2
ii	Which of the following is typically the most expensive type of 3D printer? a) SLA b) SLM c) FDM d) None of the above	2	CO2	K1	PO2
iii	Which type of printer uses an enclosed build area? a) SLA b) SLS c) MDS d) FDM	2	CO2	K2	PO3
iv	What printer melts metal? a) SLS b) SLM c) SLA d) FDM	2	CO1	K2	PO2
v	What material is not used in 3D printing? a) Nylon b) ABS c) PLA d) PVC	2	CO3	K2	PO2
vi	Which file type is most commonly exported from CAD software? a) SLDRT b) JPG c) STL d) X3G	2	CO3	K3	PO3
vii	What does SLS stand for? a) Selective laser sintering b) Selective lithographic solution c) Separated light sintering d) None of the above	2	CO2	K3	PO2
viii	Which of the following does NOT influence how refined the 3D printed part will be? a) Layer thickness b) Using support material	2	CO2	K4	PO3

	c) Part orientation d) All the above					
ix	Which type of printer uses an enclosed build area? a) SLA b) SLS c) MDS d) FDM	2	CO2	K2	PO3	
x	FDM printers can print multiple materials at one time. a) True b) False	2	CO4	K3	PO3	

Section B (Answer any FOUR out of SIX) – 20 Marks

(Each question 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Explain role of 3D printing in present scenario.	5	CO1	K2	PO1
3	Write difference between additive manufacturing and CNC Machining.	5	CO2	K1	PO2
4	Explain reverse engineering process in context of additive manufacturing.	5	CO3	K3	PO1
5	Explain the process for preparation of CAD models for 3D Printing.	5	CO4	K2	PO2
6	Write a note on the role of laser in Laser rapid manufacturing.	5	CO5	K3	PO2
7	What are different modes of directed energy deposition process?	5	CO3	K3	PO1

Section C (Answer any THREE out of FIVE) – 30 Marks-

(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Explain the complete process of additive manufacturing with the help flow chart.	10	CO1	K1	PO1
9	What are different types of additive manufacturing processes? Explain of of them.	10	CO2	K3	PO2
10	How does effective 3D components can be produced by Powder Bed Fusion Process. Explain in detail.	10	CO3	K3	PO1
11	What do you understand by Cladding? Explain the laser cladding process in AM.	10	CO4	K4	PO2
12	Explain the process of Laser-Based Joining of Metallic and Non-Metallic Materials	10	CO5	K5	PO2