GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VI EXAMINATION – WINTER 2025

Subject Code:3161922   **Date:25-11-2025**

Subject Name:Advanced Manufacturing Processes

Time:02:30 PM TO 05:00 PM   **Total Marks:70**

Instructions:
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

			MARKS
Q.1	**(a)**	A furniture company that makes upholstered chairs and sofas must cut large quantities of fabrics. Many of these fabrics are strong and wear-resistant. These properties of fabrics make them difficult to cut. Which nontraditional process would you recommend to the company for this application? Justify your answer by indicating the characteristics of the process that make it attractive and support your selection.	**03**
	(b)	Enlist the requirements that demand the use of advanced manufacturing processes.	**04**
	(c)	An ECM operation is to be used to cut a hole into a plate of aluminum that is 12 mm thick. The hole has a rectangular cross section, 10 mm x 30 mm. The ECM operation will be accomplished at a current = 1200 amps. Efficiency is expected to be 95%. specific removal rate for aluminum is 0.0344 mm^3/A-s. Determine feed rate, MRR and time required to cut through the plate.	**07**
Q.2	**(a)**	Why AJM is not recommended to machine ductile materials?	**03**
	(b)	Write the differences between WJM and AWJM processes.	**04**
	(c)	Why flushing of dielectric is needed in EDM? List different techniques of flushing and discuss any two techniques with aid of neat sketch.	**07**

OR

	(c)	Describe mechanism of material removal and energy distribution in EDM with aid of neat sketch.	**07**
Q.3	**(a)**	Why vacuum environment is needed in electron beam machining?	**03**
	(b)	Discuss the material removal mechanism of laser beam machining.	**04**
	(c)	Explain working principle of ultrasonic machining with neat sketch. Also, describe functions of slurry, horn, transducer, and oscillator.	**07**

OR

Q.3	**(a)**	Write in table form, the basic differences between CHM and ECM.	**03**
	(b)	Discuss the material removal mechanism of plasma arc machining.	**04**
	(c)	Explain working principle of abrasive water jet machining with neat sketch. Also, describe applications, limitations, and merits of the process.	**07**

Q.4 **(a)** Write difference between additive and subtractive manufacturing. **03**

(b) List major four process parameters which affects the build time in stereo-lithography (SLA). Also explain the correlation of these parameters on build time. **04**

(c) Explain working principle, advantages and limitations of selective laser sintering (SLS). **07**

OR

Q.4 **(a)** What is infill in 3d printing? How infill density affects the weight and strength of 3d printed part? **03**

(b) List major four process parameters which affects the build time in fused deposition modelling (FDM). Also explain the correlation of these parameters on build time. **04**

(c) Explain working principle, advantages and limitations of laminated object manufacturing (LOM). **07**

Q.5 **(a)** Explain press-and-blow forming of glass with neat sketch. **03**

(b) Name two processes for forming glass fibers and briefly describe one of them. **04**

(c) Explain pultrusion process of composite manufacturing with its major applications, advantages and limitations. **07**

OR

Q.5 **(a)** Describe the spinning process in glassworking with aid of neat sketch. **03**

(b) Name the process by which uniformly thick and smooth glass sheet can be produced. Also, explain this process in brief with neat sketch. **04**

(c) Explain resin transfer moulding process of composite manufacturing with its major applications, advantages and limitations. **07**

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GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VI (NEW) EXAMINATION – WINTER 2024

Subject Code:3161922   **Date:05-12-2024**

Subject Name: Advanced Manufacturing Processes

Time:02:30 PM TO 05:00 PM   **Total Marks:70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Explain the requirement of non-conventional machining processes.	03
	(b)	Give the classification of mechanical energy based processes.	04
	(c)	Explain water jet machining process with neat sketch.	07
Q.2	**(a)**	Justify the requirement of maskant in chemical machining process	03
	(b)	Distinguish between conventional and non-conventional machining process	04
	(c)	Illustrate laser beam machining process with neat diagram	07
		OR	
	(c)	Explain electron beam machining process with neat sketch	07
Q.3	**(a)**	Write advantages and disadvantages of electro chemical machining process	03
	(b)	Explain the effect of process parameters on MRR in abrasive jet machining process	04
	(c)	Explain electro discharge machining process in detail with neat diagram	07
		OR	
Q.3	**(a)**	Write applications of electro chemical grinding process	03
	(b)	How MRR changes by changing the process parameters of wire cut EDM process?	04
	(c)	Illustrate ultrasonic machining process with neat sketch	07
Q.4	**(a)**	Explain the importance of rapid prototyping process in recent scenario	03
	(b)	State advantages, disadvantages of stereo lithography process	04
	(c)	Illustrate laminated object manufacturing process with neat sketch and list its application	07
		OR	
Q.4	**(a)**	List the advantages of rapid prototyping process	03
	(b)	Distinguish between additive and subtractive manufacturing processes	04
	(c)	Explain FDM process with neat diagram	07
Q.5	**(a)**	Illustrate process flow diagram for glass manufacturing	03
	(b)	List the limitations of composite materials	04
	(c)	Explain the soda lime glass in detail	07
		OR	
Q.5	**(a)**	List the functions of matrix in composite materials	03
	(b)	Explain continuous glass fibres process with neat sketch	04
	(c)	Explain resin transfer moulding process with required diagram	07

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GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2023

Subject Code:3161922   **Date:13-12-2023**
Subject Name: Advanced Manufacturing Processes
Time:02:30 PM TO 05:00 PM   **Total Marks:70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Write classification of Unconventional Machining Processes	**03**
	(b)	write application of Electron beam Machining (EBM) and Laser Beam machining.	**04**
	(c)	Explain Electric Discharge Machining (EDM) in detail with neat diagram and its working Principle.	**07**
Q.2	**(a)**	Application of Wire cut EDM.	**03**
	(b)	Discuss Process parameters and its effect of Ultrasonic Machining (USM).	**04**
	(c)	Explain Abrasive Jet Machining (AJM) Process in detail with neat diagram.	**07**
		OR	
	(c)	Explain Chemical machining Process in detail with neat sketch.	**07**
Q.3	**(a)**	Application of Electro - Chemical machining	**03**
	(b)	Write process parameter and its effect on MRR and surface finish of EDM process.	**04**
	(c)	Explain Electro Chemical grinding (ECG) Process in detail with neat diagram.	**07**
		OR	
Q.3	**(a)**	Write history of RP systems	**03**
	(b)	Benefits of Resin Transfer Moulding (RTM)	**04**
	(c)	Explain Water Jet Machining (WJM)Process in detail with neat sketch.	**07**
Q.4	**(a)**	What is Prototyping? Enlist advantages of Rapid Prototyping	**03**
	(b)	Write application of LOM processes	**04**
	(c)	Explain Stereo lithography process in detail with neat sketch.	**07**
		OR	
Q.4	**(a)**	Write a note on 3D Printer.	**03**
	(b)	Give the classification of Rapid Prototyping processes	**04**
	(c)	Explain Fused Deposition Modelling process in detail with neat sketch.	**07**
Q.5	**(a)**	Write Glass Compositions and its Properties	**03**
	(b)	Discuss Glass Forming Processes	**04**
	(c)	Explain any Glass process and write Application of Glass	**07**
		OR	
Q.5	**(a)**	Write Advantages of Filament Winding.	**03**
	(b)	Classification of composites	**04**
	(c)	Explain Wet/Hand Lay-up Process in detail with neat diagram	**07**

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GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI(NEW) EXAMINATION – WINTER 2022

Subject Code:3161922   **Date:17-12-2022**
Subject Name:Advanced Manufacturing Processes
Time:02:30 PM TO 05:00 PM   **Total Marks:70**

Instructions:
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

			Marks
Q.1	(a)	Explain the need of Unconventional Machining Processes.	03
	(b)	Write the classification of Thermal Based Processes.	04
	(c)	Explain AJM Process in detail with neat diagram.	07
Q.2	(a)	Write the function of Maskant in CHM Process.	03
	(b)	Write difference between Conventional and Non-Conventional Machining Processes in detail.	04
	(c)	Explain LBM Process in detail with neat diagram.	07
		OR	
	(c)	Explain PAM Process in detail with neat diagram.	07
Q.3	(a)	Write applications of AWJM Process.	03
	(b)	Draw Ishikawa Cause and Effect Diagram for USM Process.	04
	(c)	Explain EDM Process in detail with neat diagram.	07
		OR	
Q.3	(a)	What is the use of Intensifier in WJM Process?	03
	(b)	Explain the effect of process parameters on MRR in AJM Process.	04
	(c)	Draw Ishikawa Cause and Effect Diagram for EDM Process.	07
Q.4	(a)	What is the need of Rapid Prototyping?	03
	(b)	Write difference between Additive Manufacturing and Subtractive Manufacturing in detail.	04
	(c)	Explain FDM Process in detail with their advantages, disadvantages, and applications.	07
		OR	
Q.4	(a)	Write disadvantages of Rapid Prototyping.	03
	(b)	Write advantages, disadvantages, and applications of SLA Process.	04
	(c)	Explain LOM Process in detail with their advantages, disadvantages, and applications.	07
Q.5	(a)	What are functions of Matrix in Composite Materials.	03
	(b)	Write the limitations of Composite Materials.	04
	(c)	Explain Filament Winding Process with neat sketch.	07
		OR	
Q.5	(a)	Draw Process Flow Diagram for Glass Manufacturing.	03
	(b)	Explain Continuous Glass Fibers Process with neat sketch.	04
	(c)	Explain Soda Lime Glass in detail.	07

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