

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. Branch :Mechanical Engineering Semester :VI

Subject Code & Name: BTMEC604C - Additive Manufacturing

Max Marks: 60

Duration: 3.45 Hr.

**Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

	(Level/CO)	Marks
<b>Q. 1 Solve Any Two of the following.</b>		
A) How additive manufacturing processes are classified as per ASTM and describe the principle of each classification.	CO2/Remember	06
B) With a neat sketch, explain fused deposition modeling process and describe the process parameters which affect the quality of a product.	CO2/Remember	06
C) Briefly explain the process chain of additive manufacturing. Name any four types of CAD data formats suitable for additive manufacturing.	CO1/Understand	06
<b>Q.2 Solve Any Two of the following.</b>		
A) What are the seven principles of design for additive manufacturing? Explain the design guidelines for overhangs, holes and unsupported walls in SLA.	CO3/Remember	06
B) What is part orientation? What are its advantages? Explain with illustrations. Enlist and define two software's used to assist Additive Manufacturing.	CO3/Remember	06
C) Why support generation, is needed? Brief about Support structure design? Explain the need of support generation with flow charts.	CO3/Remember	06
<b>Q. 3 Solve Any Two of the following.</b>		
A) Explain the guidelines for AM process selection based on visual appearance. Show with a suitable flow chart.	CO3/Remember	06
B) With an example, discuss the type of materials available for Additive Manufacturing. Also show the flow chart for AM process selection based on materials.	CO3/Remember	06
C) What are the challenges on Additive Manufacturing? Explain any two.	CO1/Understand	06
<b>Q.4 Solve Any Two of the following.</b>		
A) Define rapid tooling. Differentiate between direct and indirect tooling.	CO4/Understand	06
B) Write the appropriate AM process for manufacturing of the following: Automotive fender, pump impeller, gear shift knob, physical model of dashboard, Heat exchanger, turbine blade	CO4/Understand	06
C) Explain with a neat flowchart how dental implants are manufactured using 3-D printing.	CO4/Understand	06
<b>Q. 5 Solve Any Two of the following.</b>		
A) What are the areas in AM in which the future jobs will be available? Explain.	CO4/Understand	06
B) Explain the post-processing methods like cold welding, sanding and polishing with their advantages and limitations.	CO5/Remember	06
C) What are the different methods for aesthetic improvement in additive manufacturing? Explain any two of them.	CO5/Remember	06

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