

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch :Mechanical Engineering

Semester :VI

Subject Code & Name: BTMECE604C - 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
Q. 1 Solve Any Two of the following.			
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
Q.2 Solve Any Two of the following.			
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
Q. 3 Solve Any Two of the following.			
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
Q.4 Solve Any Two of the following.			
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
Q. 5 Solve Any Two of the following.			
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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