Exam Date & Time: 05-Dec-2023 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

VII SEMESTER B.TECH END SEMESTER EXAMINATIONS, NOV/DEC 2023
Rapid Prototyping [MME 4093]

Marks: 50   **Duration: 180 mins.**

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1)	A)	Deduce the significance of principles of design for additive manufacturing towards decreasing the cost involved in the product/prototype development and also enhancing the quality of the product/prototype	(5)
	B)	Describe the different types of prototypes used at different stages of product development	(3)
	C)	Compare traditional prototyping and rapid prototyping process	(2)
2)	A)	Explain the applications of RP in health care and aerospace industry	(5)
	B)	Mention the ASTM standard followed for the classification of RP processes and classify the various processes accordingly	(3)
	C)	Demonstrate the application of reverse engineering concepts for developing prototypes	(2)
3)	A)	Justify the statement with suitable explanation: "part orientation greatly affects total printing cost of a prototype/product"	(5)
	B)	Discuss the analytical hierarchy process applied for justifying the implementation of RP in an organization	(3)
	C)	Write a note on various materials processed using FDM technique	(2)
4)	A)	Compare SLA v/s SLS v/s SGC rapid prototyping techniques	(5)
	B)	What is •STL file format? Discuss the limitations of •STL file format	(3)
	C)	Explain the post processing step of RP process chain	(2)

5)   There is a need for developing a colourful prototype made of metal/polymer powders. There is no scope for using light energy for processing. For the above situation, identify a suitable rapid prototyping technique for developing the prototype and explain the (5)
A)   working principle of the identified technique with a neat schematic

B)   Explain the 3D modelling step of RP process chain
(3)

C)   Justify the statement with suitable reasons: "Although RP has several advantages its implementation in the industries is in slow pace"
(2)

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