

Exam Date & Time: 10-Jan-2024 (02:30 PM - 05:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

VII semester B.TECH MAKE UP SEMESTER EXAMINATIONS, JAN 2024

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) 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 using SLM technology (5)
 - A)
 - B) Describe the different components RP wheel (3)
 - C) Discuss the history of RP technology (2)
- 2) Explain the applications of RP in automotive and electronics industry (4)
 - A)
 - B) Explain the roles of prototype (4)
 - C) Demonstrate the application of reverse engineering concepts for developing prototypes (2)
- 3) Discuss the role of build orientation on mechanical behavior of the built product and the support structures required (5)
 - A)
 - 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) Compare VAT polymerization and DED types of rapid prototyping technologies (5)
 - A)
 - B) Explain different ways for minimizing the large masses of product in the context of 3D printing (3)
 - C) Explain the post processing step of RP process chain (2)

- 5) There is a need for developing a colourful prototype made of brittle ceramic powders. There is no scope for making the filaments of these powders and also for using light energy for processing. For the above situation, identify a suitable rapid prototyping technique for developing the prototype and explain the working principle of the identified technique with a neat schematic (4)
- A)
- B) Explain the Pre-processing step of RP process chain (4)
- 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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