

Code No: 157AB

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year I Semester Examinations, January/February - 2023****ADDITIVE MANUFACTURING****(Mechanical Engineering)****Time: 3 Hours****Max. Marks: 75**

- Note:** i) Question paper consists of Part A, Part B.  
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.  
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A****(25 Marks)**

- 1.a) What is the need for additive manufacturing? [2]
- b) List out the advantages of Rapid prototyping. [3]
- c) Mention the specifications of LOM. [2]
- d) What is meant by 3DP? [3]
- e) Explain the need for Rapid tooling. [2]
- f) Differentiate between direct and indirect tooling. [3]
- g) Explain 3D Keltool process. [2]
- h) What is consequence of building valid tessellated model? [3]
- i) Mention any two RP applications in biomedical industry. [2]
- j) Mention RP applications in aerospace industry. [3]

**PART – B****(50 Marks)**

- 2.a) What are the advantages of RP over conventional processes?
- b) Define the additive manufacturing process. List out the advantages of AM process in detail. [5+5]

**OR**

- 3.a) Explain the working steps in Rapid Prototyping.
- b) Explain any five commonly used terms in Rapid Prototyping. [5+5]

- 4.a) Explain with a neat sketch the working principle of LOM process.
- b) List advantages and disadvantages when rapid prototyping concept is applied to solid ground curing. [5+5]

**OR**

- 5.a) Name the materials used in fusion deposition modeling and state the advantages of this process.
- b) What are the advantages and disadvantages of FDM? [5+5]

- 6.a) What are different types of materials available for the SLS system? What are their respective applications?
- b) Briefly discuss about DTM Rapid Tool Process. [5+5]

**OR**

- 7.a) Compare LOM with SLS with suitable reasons.
- b) Which rapid tooling techniques are best suited for production of ceramic parts. Explain any one? [5+5]

- 8.a) Explain any two translators used in place of STL.  
b) Explain about STL file problems in detail with examples. [5+5]

**OR**

- 9.a) List various rapid prototyping data formats. Explain in detail.  
b) Describe the importance of magics and mimics of rapid prototyping software. [5+5]

- 10.a) Discuss RP applications in forensic science and anthropology.  
b) Discuss the GIS applications of RP. [5+5]

**OR**

- 11.a) Discuss RP applications in Visualization of Bimolecular field.  
b) What is the significant role of RP in design and production of medical devices? [5+5]

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**Code No: 157AB****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year I Semester Examinations, February/March - 2022****ADDITIVE MANUFACTURING****(Mechanical Engineering)****Time: 3 Hours****Max. Marks: 75****Answer any five questions****All questions carry equal marks**

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- 1.a) Many terms have been used to mean Rapid Prototyping. Discuss three such terms and explain why they have been used in place of Rapid Prototyping.
- b) Distinguish between Traditional prototyping and Rapid prototyping. [8+7]
- 2.a) Write some of the industrial applications of RPT process.
- b) Explain the process chain of Rapid Prototyping. [7+8]
- 3.a) Explain the Laminated Object Manufacturing with a neat sketch.
- b) Describe the main advantages and disadvantages of using SLA. [8+7]
- 4.a) Describe the critical factors that will influence the performance and functions of:  
(i) Cubic's LOM, (ii) Stratasys FDM.
- b) Explain the Solid ground curing process, its advantages and disadvantages. [8+7]
- 5.a) Explain the critical factors that influence the performance and functionalities of the following RP Processes : (i) 3D System's SLS, (ii) Z Corporation's 3DP.
- b) Distinguish between the direct vs. indirect types of Rapid tooling. [8+7]
- 6.a) Describe the Selective laser sintering process, with a neat sketch.
- b) Distinguish between conventional tooling and rapid tooling. [8+7]
- 7.a) Some newly proposed formats are CLI, RPI and the LEAF files. Describe them briefly and contrast their strengths and weaknesses.
- b) Explain the features of RP software's : Magics, View expert. [8+7]
- 8.a) Describe how RP models can be used for pre-surgical operation planning. Use appropriate examples to illustrate your answer.
- b) Why and in what circumstances would RP be considered to assist implant fabrication? [8+7]

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**Code No: 157AB**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech IV Year I Semester Examinations, July/August - 2022**

**ADDITIVE MANUFACTURING**

**(Mechanical Engineering)**

**Time: 3 Hours**

**Max.Marks:75**

**Answer any five questions  
All questions carry equal marks**

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- 1.a) Explain prototyping fundamentals and historical development in detail.
- b) Describe the fundamental automated processes. [7+8]
2. Analyze rapid prototyping process chain with fundamental automated processes. [15]
3. Evaluate models, specifications, working principle and process of Solid Ground Curing (SGC). [15]
4. Explain models, specifications, working principle and process of Fused Deposition Modeling (FDM). [15]
5. Discuss process, working principle, applications, advantages and disadvantages of three dimensional printing (3DP). [15]
6. Explain the classification of rapid tooling in detail. [15]
- 7.a) Explain STL file Repairs, generic solution, other translators and newly proposed formats.
- b) Analyze the features of various RP software's of View Expert and 3-D View. [8+7]
- 8.a) Discuss the rapid prototyping applications in engineering, analysis and planning?
- b) Explain visualization of biomolecules using rapid prototyping. [8+7]

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