



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Mechanical Engineering

Semester End Examination; May / June - 2018

Additive Manufacturing

Time: 3 hrs

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

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| 1 a. | Discuss brief history of AM systems. | 8 |
| | b. Explain evolution of RP to AM. | 6 |
| | c. Differentiate between digital and virtual prototype. | 6 |
| 2 a. | Sketch and explain Stereo Lithography (SL) process by listing out all the steps. | 12 |
| | b. Explain solid ground curing process with neat diagrams. | 8 |

UNIT - II

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| 3 a. | With a neat sketch, explain working principle of Selective Laser Sintering (SLS) process. List its merits and demerits. | 10 |
| | b. Explain with a neat sketch Laser Engineering Net Shaping (LENS) process along with its application. | 10 |
| 4 a. | With a neat sketch, explain principle of operation, LOM materials, process parameters and process details of Laminated Object Manufacturing (LOM). | 10 |
| | b. Sketch and explain Fused Deposition Modeling (FDM) process. Write down its applications. | 10 |

UNIT - III

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| 5 a. | Describe functional models. Explain pattern for investment and vacuum casting. | 10 |
| | b. Briefly explain medical, art and engineering analysis models. | 10 |
| 6 a. | List the different types of Concept modellers. | 4 |
| | b. Sketch and explain the working principle of 3D systems Thermo jet (Multijet) printer with its benefits and limitations. | 8 |
| | c. Explain stratasy's X's 3D printer with a neat sketch. | 8 |

UNIT - IV

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| 7 a. | Explain different types of tooling methods with the help of block diagrams. | 8 |
| | b. Sketch and explain metal deposition tools process along with different spraying techniques. | 12 |
| 8 a. | Explain step by step complete process involved in DTM rapid steel 1.0, rapid steel 2.0 and copper polyamide processes. | 12 |
| | b. Explain the process of sand casting along with diagrams. | 8 |

UNIT - V

- 9 a. Define rapid manufacturing. List and explain errors due to data preparation. 12
- b. Explain errors occurred during part building in rapid manufacturing. 8
10. Write short notes on :
- (i) Errors in finishing 20
 - (ii) Orientation constraints of SL process
 - (iii) Orientation constraints of SLS process

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