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

(An Autonomous Institution affiliated to VTU, Belgaum)
First Semester, M. Tech - Mechanical Engineering
Semester End Examination; Jan - 2017
Additive Manufacturing

Time: 3 hrs   *Max. Marks: 100*

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

UNIT - I

1 a.	Compare virtual and physical prototypes. Discuss different elements of a functional prototype.	6
b.	Discuss the three build styles associated in creating parts using stereolithography.	14
2 a.	Discuss the basic steps involved in fabricating a part using RP technique.	12
b.	Write a neat diagram, explain stereolithography process.	8

UNIT - II

3 a.	Explain the different features incorporated in recent FDM systems.	6
b.	Discuss the different materials used in SLS.	6
c.	List the merits and demerits of LOM process.	8
4 a.	Explain the working principle of selective laser sintering with a neat diagram.	8
b.	Explain part building procedure adopted in solid ground curing.	8
c.	List the four steps involved in the separation of a part fabricated using LOM process.	4

UNIT - III

5 a.	Explain the principle of operation of LENS process with a neat sketch.	8
b.	Explain the different steps involved in the building of RP models of anatomical structures.	6
c.	Elaborate the purpose of concept modellers and discuss principle of building a model using stratasys Genesys Xs 3D printer.	6
6 a.	Discuss a case study to demonstrate the use of RP models in the medical domain.	6
b.	Discuss the process steps involved in fabricating parts using JP system 5.	10
c.	List the major medical applications of RP models.	4

UNIT - IV

7 a.	With a neat sketch, describe spray metal tooling system.	10
b.	Describe direct ACES injection moulds process with neat sketches.	10
8 a.	Write a note on copper polyamide inserts.	4
b.	Describe the different steps employed to produce inserts by 3D Kel tool process.	6
c.	Discuss the following : i) DMLS ii) Pro metal.	10

UNIT - V

9 a. Discuss the two types of errors resulting from slicing. 10

  b. Explain the different orientation constraints that are considered for stereolithography process. 10

10 a. Appraise the following data preparation errors due to tessellation :

 i) Chord Height 7

 ii) Angle Control.

  b. Formulate error due to replacement of arcs with stair-steps. 8

  c. Write a note on surface digitization. 5

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