

Hall Ticket Number:

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Code No.: 16110 N(F)

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (CBCS) VI-Semester Main Examinations, May-2019

Additive Manufacturing and its Applications
 (Open Elective-VII)

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

| Q.No. | Stem of the question | M | L | CO | PO |
|-----------------------------------|---|---|---|----|----|
| Part-A (10 × 2 = 20 Marks) | | | | | |
| 1. | Define the term prototype and give examples. | 2 | 1 | 1 | 1 |
| 2. | What are the advantages of STL file? | 2 | 2 | 1 | 1 |
| 3. | What is the principle of SLA process? | 2 | 2 | 2 | 1 |
| 4. | What are the main components of Solider SGC system? | 2 | 2 | 2 | 1 |
| 5. | Name the current generation SLS machines developed by 3D systems. | 2 | 1 | 3 | 1 |
| 6. | Explain the principle of FDM process. | 2 | 2 | 3 | 1 |
| 7. | How Additive manufacturing Technology (AMT) systems are used in GIS applications? | 2 | 1 | 4 | 1 |
| 8. | List the various materials used in AMT. | 2 | 1 | 4 | 1 |
| 9. | Name the two AM data formats. | 2 | 1 | 1 | 1 |
| 10. | Define the two principles used in SLS process. | 2 | 1 | 3 | 1 |
| Part-B (5 × 10 = 50 Marks) | | | | | |
| 11.a) | Analyze the steps involved in any RPT process. | 6 | 4 | 1 | 1 |
| b) | List the benefits of AMT to product designers. | 4 | 2 | 1 | 1 |
| 12.a) | Discuss the Photo-polymerization process (in SLA) with sketches. | 6 | 6 | 2 | 1 |
| b) | Explain the principle used in Solid Ground Curing (SGC) Process. | 4 | 2 | 2 | 1 |
| 13.a) | Explain the 3 phases in the process of Laminated object manufacturing (LOM). | 6 | 4 | 3 | 1 |
| b) | What is the principle used in 3DP technology. | 4 | 2 | 3 | 1 |
| 14.a) | Explain the application of AMT systems in Biomedical field with a case study. | 6 | 2 | 4 | 1 |
| b) | What are the applications of AMT systems in design? | 4 | 2 | 4 | 1 |
| 15.a) | Explain the role of prototypes in Engineering. | 6 | 2 | 1 | 1 |
| b) | List the strengths and weaknesses of SLA process. | 4 | 1 | 2 | 1 |
| 16.a) | Discuss the case study where LOM was used to create Hot gas manifold for space shuttle main engine. | 6 | 6 | 3 | 4 |
| b) | Explain how AMT is used in Jewelry industry. | 4 | 2 | 4 | 1 |
| 17. | Answer any <i>two</i> of the following: | | | | |
| a) | What are the problems that plague STL files? | 5 | 2 | 1 | 1 |
| b) | Discuss the weaknesses of FDM technology. | 5 | 2 | 3 | 1 |
| c) | Name all the hardware components in sinter station Pro SLS system and their function. | 5 | 1 | 4 | 1 |

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

| S. No. | Criteria for questions | Percentage |
|--------|--|------------|
| 1 | Fundamental knowledge (Level-1 & 2) | 71 |
| 2 | Knowledge on application and analysis (Level-3 & 4) | 17 |
| 3 | *Critical thinking and ability to design (Level-5 & 6) (*wherever applicable) | 12 |

