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# V SEMESTER B.TECH. (MECHATRONICS ENGINEERING) END SEMESTER MAKE – UP EXAMINATIONS, JAN 2019

SUBJECT: ADDITIVE MANUFACTURING TECHNOLOGY [MTE 4009]

### Time: 3 Hours

#### MAX. MARKS: 50

#### Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Appropriate data may be assumed.
- 1A. In the tableware industry, CAD, and additive technologies were used in creation of better designs faster and accurately. Two additive systems were selected for experimentation in the tableware system.
  (1+3)
  - i. Name the two RP systems that were selected for the experiment.
  - ii. Compare the two systems in terms of:
    - a. Material used
    - b. Aesthetic features
    - c. Build Time

#### **1B.** Discuss the structural transformations in crystalline and amorphous structures. **04**

## **1C.** Diagrammatically represent edge and vertex redundancy in a STL file. **02**

## 2A. Interpret the STL file shown in figure Q2A. Answer the following questions: 06

- i. Name the error of the STL file.
- ii. State the reason for its occurrence.
- iii. In what way the error encountered is resolved? Represent it diagrammatically.

(1+1+4)



Figure Q2A

2 <b>B</b> .	Contrast between additive manufacturing and CNC with respect to the following:	04					
	lonowing.	(2+2)					
	<ul><li>i. Programming</li><li>ii. Materials</li></ul>						
3A.	Describe the steps involved in Direct Metal Deposition Process in context of additive manufacturing.						
3B.	On what factors does the properties of composites depend upon?						
3C.	Explain the linear chain and branched chain polymers.						
4A.	With the help of a diagram, elucidate the principle of 3D System's Selective Laser Sintering (SLS) process.						
4B.	Illustrate the control system schematics of Rapid Freeze Prototype Process. Outline the process parameters that are examined.						
5A.	Draw the schematic representation of Helisys Laminated Object Manufacturing (LOM) System.						
5B.	<ul><li>i. Differentiate between Conventional Tooling and Rapid Tooling.</li><li>ii. Elaborate on the terms form, fit and function in context of additive manufacturing.</li></ul>	04 (2 + 2)					
5C.	List any two disadvantages of Initial Graphic Exchange Specification (IGES) standard.	02					