

315351

12526

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answer with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following: **10****
- a) State the advantages of 3D printing. (Any four points)
- b) Give classification of additive manufacturing processes.
- c) Name the most common slicing softwares used in 3D printing process.
- d) State the need of hybrid materials used in 3D printing.
- e) List the names of different post processing techniques.
- f) Define VAT photopolymerization.
- g) State the basic principle of 3D printing.

P.T.O.

- 2. Attempt any THREE of the following: 12**
- a) Compare Additive manufacturing and Traditional Manufacturing. (Any four points)
 - b) Describe laminated object manufacturing process with neat diagram.
 - c) Define CAD and explain native CAD formats.
 - d) Describe the criteria for selecting proper materials in 3D printing.
- 3. Attempt any THREE of the following: 12**
- a) List the names of eight steps involve in 3D printing process and explain the same.
 - b) Describe selective laser melting process with neat diagram.
 - c) State the types of STL file formats and discuss how STL file is generated from 3D CAD data.
 - d) List and explain any four common Faults in 3D printing.
- 4. Attempt any THREE of the following: 12**
- a) Explain troubleshooting methods in 3D printing.
 - b) Explain the different methods for transferring data from software to 3D printer.
 - c) State the role of common basic slicer settings as given below:
 - i) layer height
 - ii) fill density
 - iii) supports
 - iv) shell thickness
 - d) Write the properties and applications of the following:
 - i) PLA
 - ii) ABS
 - e) Explain support material removal type of post-processing techniques used in 3D printing.

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Marks

- 5. Attempt any TWO of the following: 12**
- a) Explain the governing bonding mechanisms in different 3D printing technologies.
 - b) Explain different errors in STL files. (Any three points)
 - c) List any six defects and their causes in 3D printing.
- 6. Attempt any TWO of the following: 12**
- a) Explain in detail the use of additive manufacturing process in Health-Care domain.
 - b) Compare and contrast the use of liquid, solid, wire, and powder forms of raw materials in 3D printing.
 - c) List and explain the different process selection parameters for AM for specific application requirements.
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