22232

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **5 × 2 = 10**

(a) List any 4 CAD file formats.

(b) State the need of STL model.

(c) Define VAT photopolymerization.

(d) State powder bed fusion.

(e) Define bonding Mechanism in additive manufacturing.

(f) Define curing in 3D printing.

(g) Define CAD.

2. Attempt any THREE of the following : 3 × 4 = 12

(a) Compare Additive Manufacturing and Traditional Manufacturing. (4 points)

(b) Write the short notes on :

(i) Advantages of CAD (ii) Applications of CAD packages

(c) Explain Fused Deposition Modelling (FDM) w.r.t. extrude of fibers.

(d) List and explain any 4 common faults in 3D printing.

3. Attempt any THREE of the following : 3 × 4 = 12

(a) Explain Laser-Stereolithography (SL) with diagram.

(b) Explain different troubleshooting methods in 3D printing.

(c) Explain different errors caused in STL files.

(d) List and explain any 4 features of ABS.

4. Attempt any THREE of the following : 3 × 4 = 12

(a) Explain different errors in STL files.

(b) Compare BJ(Binder Jetting) and MJ(Material Jetting). (4 points)

(c) Define Polymer. Explain any three properties of it.

(d) Explain the Process Design Post Processing requirements in 3D printing.

(e) List and explain any four applications of 3D printing.

5. Attempt any TWO of the following : 2 × 6 = 12

(a) Explain the Generic Additive Manufacturing Process with block diagram.

(b) Explain different methods for inspection and testing in 3d printing.

(c) List and explain six different types of 3D printing materials with their applications.

6. Attempt any TWO of the following : 2 × 6 = 12

(a) List any 6 defects and their causes in 3d printing.

(b) Explain in detail the use of additive manufacturing process in Health-Care domain.

(c) List and explain the support materials used in 3D printing.