

## Scheme – I

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### Sample Question Paper

<b>22681</b>
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**Program Name : Automation and Robotics**

**Program Code : AO**

**Semester : SIXTH**

**Course Title : 3D PRINTING [DPR]**

**Marks : 70**

**Time:3Hrs.**

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#### Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

#### **Q.1) Attempt any FIVE of the following: - 10 Marks (5X2)**

- (a) Define 3D printing.
- (b) List any 4 post processing techniques.
- (c) List any 4 types of materials used for 3D printing.
- (d) List any 4 features of ABS.
- (e) Define VAT polymerization.
- (f) Define bonding Mechanism in additive manufacturing.
- (g) List process parameters in 3D printing

#### **Q.2) Attempt any THREE of the following: - 12 Marks (3X4)**

- (a) Explain the basic principles of Additive Manufacturing Process.
- (b) Compare Additive manufacturing and Traditional Manufacturing w.r.t working principle, costing, wastage, manpower.
- (c) Explain Selective laser sintering is an additive manufacturing technology.
- (d) Explain different errors in STL files.

#### **Q.3) Attempt any THREE of the following. 12 Marks (3X4)**

- (a) State the advantages and disadvantages of PLA material.
- (b) Explain Additive manufacturing process in 3D printing.
- (c) Explain the effect of Governing Bonding Mechanism in 3D printing.
- (d) Additive manufacturing process is used in the Healthcare domain, Explain.

**Q.4) Attempt any THREE of the following.**

**12 Marks (3X4)**

- (a) Explain the file formats in CAD and their types.
- (b) Explain the process about support removals in 3D printing.
- (c) Explain Selective Laser Sintering in any of the applications.
- (d) List any 8 features of ABS material.
- (e) Explain in detail the use of additive manufacturing process in construction Technology.

**Q.5) Attempt any TWO of the following.**

**12 Marks (2X6)**

- (a) Explain the Benefits & Limitations of Binder Jetting.
- (b) List any three defects and its cause in the additive manufacturing process.
- (c) Define polymer. Explain any four properties of it.

**Q.6) Attempt any TWO of the following.**

**12 Marks (2X6)**

- a) Explain Post- Processing in Additive Manufacturing.
- b) Explain Generic Process for CAD.
- c) List and explain six different types of 3D printing materials with their applications.

## Scheme – I

Roll No.		
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### Sample Test Paper - I

22681
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**Program Name** : Automation and Robotics  
**Program Code** : AO  
**Semester** : SIXTH  
**Course Title** : 3D PRINTING [DPR]  
**Marks** : 20

**Time:1 Hour**

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#### Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

#### Q.1 Attempt any FOUR.

**08 Marks (4X2)**

- a) Compare BJ(Binder Jetting)and MJ(Material Jetting) any two points on working principle.
- b) List any four types of powdered materials used in 3D printing.
- c) State powder bed fusion
- d) Define Material Extrusion
- e) State the use of additive manufacturing.
- f) Write any four applications of 3D printing.

#### Q.2 Attempt any THREE.

**12 Marks (3X4)**

- (a) Explain STL model.
- (b) Explain the steps involved in maintenance of any application based 3D printer.
- (c) Draw and explain the generic process of 3D printing.
- (d) List any four types of additive manufacturing techniques.

## Scheme – I

Roll No.		
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### Sample Test Paper - II

22681
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**Program Name** : Automation and Robotics  
**Program Code** : AO  
**Semester** : SIXTH  
**Course Title** : 3D PRINTING [DPR]  
**Marks** : 20

**Time: 1 Hour**

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#### Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

#### Q.1 Attempt any FOUR.

**08 Marks(4X2)**

- (a) Define VAT polymerization.
- (b) State the need for slicing.
- (c) List any two types of materials used in 3D printing.
- (d) List any two post processing techniques
- (e) Define Extrusion temperature.
- (f) Define Curing.

#### Q.2 Attempt any THREE.

**12 Marks(3X4)**

- (a) Describe the following (i) Resin 3D printing liquid, (ii) PETG.
- (b) Explain the materials used for Binder jetting technology in detail
- (c) Explain the need of support materials used in 3D printing.
- (d) Explain the four different types of 3D printing materials with their applications.