Savitribai Phule Pune University				
Department of Mechanical Engineering				
Unit 3 : Extrusion and energy based Techniques - Theory Question Bank				
Subject: Additive Manufacturing [402045C]				Class: BE
Sr. No.	**Question Statement**	**CO**	**BL**	**Marks**
1	Explain the process of Fused Deposition Modeling (FDM) with suitable sketch. Also write merits, demerits and applications.	3	2, 6	09
2	Explain the process of Direct Metal Deposition (DMD) with suitable sketch. Also write merits, demerits and applications.	3	2, 6	09
3	Explain the process of Robocasting with suitable sketch. Also write merits, demerits and applications.	3	2, 6	08
4	Describe with neat sketch the Direct Ink Writing (DIW) technique and process physics associated with it.	3	2, 6	08
5	Explain Bio-printing with principle, construction and working with suitable sketch.	3	2, 6	08
6	Explain the process of Polyjet Printing with suitable sketch. Also write merits, demerits and applications.	3	2, 6	09
7	Explain the process of Binder Jetting with suitable sketch. Also write merits, demerits and applications.	3	2, 6	09
8	Explain the process of Electron Beam-based DED with suitable sketch. Also write merits, demerits and applications.	3	2, 6	09
9	Explain the process of Direct Metal Deposition (DMD) with suitable sketch. Also write merits, demerits and applications.	3	2, 6	09
10	Explain the process of Multi-jet Modeling (MJM) with suitable sketch. Also write merits, demerits and applications.	3	2, 6	09

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Department of Mechanical Engineering				
Unit 4 : Materials and Design for AM - Theory Question Bank				
Subject: Additive Manufacturing [402045C]				Class: BE
Sr. No.	**Question Statement**	**CO**	**BL**	**Marks**
1	What is DFAM? What are the rules and recommendations for DFAM?	4	2, 6	08
2	Explain types of material used in Additive Manufacturing. Also write merits, demerits and application.	4	2, 6	09
3	Discuss the significance of Surface enhancement Techniques in AM. Explain any two Surface enhancement Techniques.	4	2, 6	09
4	What are the different types of post processing techniques in AM? Why post processing is necessary in additive manufacturing?	4	2, 6	09
5	Explain phase transformation in AM.	4	2, 6	08
6	Explain the materials used in 4D Printing with important process parameters, benefits, drawbacks, Limitations and appropriate applications.	4	2, 6	09
7	Explain use of Shape-Memory Alloys in Additive Manufacturing with important process parameters, benefits, drawbacks, Limitations and appropriate applications.	4	2, 6	09
8	Explain use of Biomimetic Materials in Additive Manufacturing with important process parameters, benefits, drawbacks, Limitations and appropriate applications.	4	2, 6	09
9	Explain the criteria of material selection in Additive Manufacturing with suitable examples.	4	2, 6	09
10	Explain varieties of heat treatment applied in pre- and post-processing of additive manufacturing based products.	4	2, 6	08

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Department of Mechanical Engineering				
Unit 5 : Hardware and Software for AM - Theory Question Bank				
Subject: Additive Manufacturing [402045C]				Class: BE
Sr. No.	**Question Statement**	**CO**	**BL**	**Marks**
1	Describe any four Preparatory function [G code] and any four Miscellaneous function [M code] used in additive manufacturing.	5	2, 6	08
2	What are the different types of Types of In-fill pattern? Describe in details.	5	2, 6	09
3	Explain and illustrate the different types of slicing and path planning.	5	2, 6	09
4	Explain the design considerations of Powder Bed Spreading Mechanisms also known as recoater system used in Metal based 3D Printers.	5	2, 6	09
5	Explain the Construction, Layout and sub-system of Fused Deposition Modeling [FDM] process based 3D Printers.	5	2, 6	08
6	Explain the classification of Equipment Topology/Layout Frame Designs used in 3D Printers with illustrations.	5	2, 6	09
7	Explain the Construction, Layout and sub-system of Selective Laser Sintering [SLS] process based 3D Printers.	5	2, 6	08
8	Explain Cold end and hot end of Extruders used in Polymer based 3D Printers.	5	2, 6	08
9	Explain the design considerations of different types of nozzles used in Polymer based 3D Printers.	5	2, 6	08
10	Explain function of gas circulation system, powder handling system and base plate in 3D printer.	5	2, 6	08

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Department of Mechanical Engineering				
Unit 6 : Case Studies, Application and Special Topics - Theory Question Bank				
Subject: Additive Manufacturing [402045C]				Class: BE
Sr. No.	**Question Statement**	**CO**	**BL**	**Marks**
1	Explain how additive manufacturing is used in Automotive Industries. Also write merits, demerits and practical feasible applications with illustrations.	6	2, 6	09
2	Explain how additive manufacturing is used in Assistive Devices Sector. Also write merits, demerits and practical feasible applications with illustrations.	6	2, 6	09
3	What is 4D Printing? Explain and illustrate its applications.	6	2, 6	08
4	What is 5D Printing? Explain and illustrate its applications.	6	2, 6	08
5	What is Bio-printing? Explain and illustrate its applications.	6	2, 6	08
6	What are the Bio-materials? Explain and illustrate their applications.	6	2, 6	08
7	Explain the Trends in 3D Printing Mass Customization.	6	2, 6	08
8	Explain how additive manufacturing is used in Jewelry Sector. Also write merits, demerits and practical feasible applications with illustrations.	6	2, 6	09
9	Explain how additive manufacturing is used in Bio-medical Applications. Also write merits, demerits and practical feasible applications with illustrations.	6	2, 6	09
10	Explain how additive manufacturing is used in Aerospace Industries. Also write merits, demerits and practical feasible applications with illustrations.	6	2, 6	09