

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***UG/PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2026****Second Semester****M.E Product Design and Development****PPDT2423-SOLID FREEFORM MANUFACTURING****Regulations - 2024****Duration: 3 Hrs.****Maximum: 100 Marks****PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

Q.No	Questions	BLT	CO	Marks
1.	Illustrate your understanding about the term 'Solid Freeform Manufacturing (SFM).	L2	1	2
2.	Outline the principles of 3D food printing with an example.	L1	1	2
3.	Mention the benefits and challenges associated with the application of topology optimization in SFM.	L2	2	2
4.	What do you mean by model slicing?	L1	2	2
5.	State the purpose of post-processing steps in the stereolithography process.	L1	3	2
6.	Compare the principles and processes of LOM and UAM.	L2	3	2
7.	List the design rules for FDM.	L1	4	2
8.	Is a vacuum chamber environment required for the Electron Beam Melting process? Justify your answer.	L2	4	2
9.	What are the limitations of the material jetting process?	L1	5	2
10.	Compare continuous mode and drop on demand mode.	L2	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11. a	Explain the process chain of additive manufacturing with the help of a neat diagram.	L2	1	16
Or				
b	With examples, explain food printing and electronics printing in detail.	L2	1	16
12. a	Explain how the design for additive manufacturing principles contribute to improving part quality in terms of structural integrity, surface finish, and dimensional accuracy.	L2	2	16
Or				
b i	Summarize the unique capabilities of additive manufacturing.	L2	2	8
i	Interpret the importance of support structure design and generation in additive manufacturing.	L2	2	8
13. a	Explain the Digital Light Processing in detail with a neat sketch. List the advantages and limitations of the process over other rapid prototyping techniques.	L2	3	16

Or

b	Outline the working principles, process, materials, advantages, limitations and applications of LOM?	L2	3	16
14. a	A design team is developing a functional enclosure for an electronic sensor using FDM 3D printing. identify the suitability of FDM, compare material options, suggest optimal print parameters, and recommend post-processing methods to ensure part performance and quality.	L3	4	16
Or				
b	Make use of labeled diagram explain the implementation of Electron Beam Melting in additive manufacturing, and elucidate its operational principles with reference to a practical example.	L3	4	16
15. a	Demonstrate the Binder Jetting process with a neat diagram and explain how this process can be applied to manufacture complex parts.	L2	5	16
Or				
b	Describe the process, materials, advantages, limitations and applications of Laser Engineered Net Shaping.	L2	5	16
