Reg. No.												

Question Paper Code	12596

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Seventh Semester

Mechanical Engineering

20MEPW701 - 3D PRINTING AND SUSTAINABLE DESIGN WITH LABORATORY

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Describe the need for the development of 3D printing technology.	2	K2	CO1
2.	Expand the term (i) SLM (ii) VP.	2	K1	CO1
3.	Define "support structure" in the context of additive manufacturing.	2	K1	CO2
4.	Define model slicing and its significance in additive manufacturing.	2	K1	CO2
5.	Describe the key principle behind Fused Deposition Modeling (FDM) in 3D printing.	2	K2	CO3
6.	Provide examples of applications where Selective Laser Sintering (SLS) is commonly used.	2	K1	CO3
7.	Give some examples of Sustainable Development.	2	K1	CO4
8.	Define the term Design for Longevity.	2	K1	CO4
9.	Define system map.	2	K1	CO5
10.	Define Remanufacturing.	2	K1	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	Explain in detail about any two additive manufacturing processes with suitable diagram.	13	K2	CO1
		OR			
	b)	Illustrate the applications of 3D printing in Industry 4.0 with suitable examples.	13	K2	CO1
12.	a)	Explain the key steps involved in CAD model preparation for additive manufacturing. How do data requirements differ between traditional modeling and additive manufacturing?	13	K2	CO2
		OR			
	b)	What is Rapid Tooling? What its types? Explain any one with suitable diagram.	13	K2	CO2
13.	a)	Provide an in-depth overview of the Selective Laser Sintering (SLS) process, including its advantages, limitations, and notable applications.	13	K2	CO3

OR

	b)	Summarize the concept of Material Jetting in 3D printing and provide examples of industries where it is particularly beneficial.	*13*	*K2*	*CO3*
14.	a)	Explain in detail about the stages of product life cycle.	*13*	*K2*	*CO4*
		OR			
	b)	Summarize various systems approaches to design.	*13*	*K2*	*CO4*
15.	a)	Explain in detail about the four stages of MSDS with its subsystems.	*13*	*K2*	*CO5*
		OR			
	b)	What are the design tools for Sustainable Development System? Explain any six.	*13*	*K2*	*CO5*

PART - C (1 × 15 = 15 Marks)

16.	a)	Discuss in detail about the opportunities of sustainable manufacturing in industry 4.0.	*15*	*K2*	*CO2*
		OR			
	b)	Explore in detail about Laser Engineered Net Shaping (LENS) and its significance in the aerospace and medical industries.	*15*	*K2*	*CO4*