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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, May 2024

Mechanical Engineering (open elective offered to Civil, ECE, Biomedical, IT, Industrial, Printing & packaging)

Vth Semester

ME5693 & APPLICATIONS OF 3D PRINTING TECHNIQUES
(Regulation 2019)

Time: 3hrs

Max.Marks: 100

CO1	To understand about concept of 3D printing
CO2	To appreciate the role of 3D printing in food technology
CO3	To appreciate the role of 3D printing in fashion technology
CO4	To appreciate the role of 3D printing in construction technology
CO5	To appreciate the role of 3D printing in healthcare Industry

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A (10x2=20Marks)
(Answer all Questions)

Q. No.	Questions	Marks	CO	BL
1	Write the different names of 3D printing process.	2	1	1
2	Write a short note on the type of 3D printing process which is mainly used for repair work.	2	1	2
3	Write a short note on the roles of hydrocolloid in 3D printing of Food Products?	2	2	2
4	List the processes that are used in the 3D printing of food particles.	2	2	1
5	Write the advantages of 3D Printed shoes.	2	3	1
6	Write a short note on chainmail fabric.	2	3	1
7	What is plastic viscosity?	2	4	1
8	List any four testing methods for extrudability.	2	4	1
9	What is bio printing?	2	5	2
10	Write down the disadvantages of using 3D printed components in dental applications.	2	5	1

PART- B (5x 13=65Marks)
(Restrict to a maximum of 2 subdivisions)

Q. No.	Questions	Marks	CO	BL
11 (a)	With neat sketches, justify that 3D printing is better than conventional manufacturing processes.	13	1	3
OR				
11 (b)	Write the working principle of FDM process with a neat sketch. Discuss the advantages and applications of FDM.	13	1	3
OR				
12 (a)	Write a short note on Viscosity, surface tension, rheology with respect to food materials and its role on 3D printing. Discuss the 3D printing of food particles in space applications.	13	2	4

12 (b)	Explain how 3D printing of food products will help in treating Dysphagia. Write the limitations of 3D printing of food products.	13	2	4
13 (a)	Discuss the benefits of 3D printing in fabricating sportswear with examples.	13	3	4
OR				
13 (b)	Discuss the applications of 3D printing process in conductive textiles. Write down the limitations of 3D printing in textile industries	13	3	4
14 (a)	Write the advantages of using 3D printing in Construction industries with any two case studies.	13	4	3
OR				
14 (b)	Write the roles of Secondary cementitious materials such as fibers, Nano clay, Superplasticizer, accelerator, and aggregate.	13	4	3
15 (a)	Discuss the step by step procedures related to the use of 3D Printing by doctors for performing surgeries.	13	5	4
OR				
15 (b)	Discuss the role of 3D printing in forensic sciences. Discuss the challenges of bio printing.	13	5	4

PART- C (1x 15=15Marks)
(Q.No.16 is compulsory)

Q. No.	Questions	Marks	CO	BL
16.	<p>Design a product of your choice. Discuss the various preprocessing, processing and post processing procedures involved in 3D printing of the designed product.</p> <p>Suggest and suitable material and 3D printing process for the designed product. Justify materials and process selection.</p>	15	1	6

