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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

TEST 1

Winter Semester: 2021 - 22

Course Code: MEC 3023

Course Name: Rapid Tooling & Industrial Applications

Program & Sem: B-tech 4th sem

Date: 27.04.2022

Time: 11:30 AM to 12:30 PM

Max Marks: 30 Marks

Weightage: 15%

Instructions:

(i) Read the all questions carefully and answer accordingly.

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries THREE marks. (4Qx 3M= 12M)

1. Brief the history of Additive Manufacturing. (C.O.No.1) [Knowledge level]
2. List the different Methods of Additive Manufacturing. (C.O.No.1) [Knowledge level]
3. What are the key differences between the various types of AM processes?
(C.O.No.1) [Knowledge level]
4. What are the benefits and limitations of Additive Manufacturing? (C.O.No.1) [Knowledge level]

Part B [Thought Provoking Questions]

Answer both the Questions. Each question carries FIVE marks. (2Qx5M=10M)

5. Do you think AM will ever be able to produce large structures, such as an aircraft wing? If so, what's needed to make this happen? (C.O.No.2) [Comprehension level]
6. As 3D printing continues to evolve, how will it change traditional manufacturing processes?
(C.O.No.2) [Comprehension level]

Part C [Problem Solving Questions]

Answer the Question. The question carries EIGHT marks. (1Qx8M=8M)

7. Describe the operation steps of a powder bed fusion AM process, detailing the powder and gas flow loops, the movement of build platform and laser firing sequence. Why is reverting the powder important in the powder bed process? What is the gas which is typically used and what function does it serve? (C.O.No. 3) [Application level]



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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

TEST 2

Winter Semester: 2021 - 22

Course Code: MEC 3023

Course Name: Rapid Tooling & Industrial Applications

Program & Sem: B-tech 4th sem

Date: 02.JUNE.2022

Time: 11:30 AM - 12:30 PM

Max Marks: 30 Marks

Weightage: 15%

Instructions:

(i) *Read the all questions carefully and answer accordingly.*

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries THREE marks.

(4Qx 3M=12M)

Q.NO.1 Brief on Cura slicing Software.

(C.O.No.2) [Knowledge level]

Q.NO.2 List the different Methods of Solid based Additive Manufacturing.

(C.O.No.3) [Knowledge level]

Q.NO.3 what are the key differences between Solid based & Powder based types of AM processes?

(C.O.No.3) [Knowledge level]

Q.NO.4 what are the benefits and limitations of LOM?

(C.O.No.3) [Knowledge level]

Part B [Thought Provoking Questions]

Answer both the Questions. Each question carries FIVE marks.

(2Qx5M=10M)

Q.NO.5. Rapid tooling is the group of techniques used to fabricate tooling fast, at low cost, and efficiently for traditional manufacturing processes to create parts on a slim timeline or in lower quantities. List down the Applications of the same with respect to current trends.

(C.O.No.4) [Comprehension level]

Q.NO.6. Rapid prototyping is the group of techniques used to quickly fabricate a scale model of a physical part or assembly using three-dimensional computer-aided design (CAD) data. Explain Selective laser sintering process and its processing through CAD software

(C.O.No.4) [Comprehension level]

Part C [Problem Solving Questions]

Answer the Question. The question carries EIGHT marks.

(1Qx8M=8M)

Q.NO.7 Explain the working principle and details of process parameters of an FDM machine.

(C.O.No. 4) [Knowledge level]



**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

END TERM EXAMINATION

Winter Semester: 2021 - 22

Course Code: MEC 3023

Course Name: Rapid Tooling & Industrial Applications

Program & Sem: B.Tech (PET) & IV sem

Date: 4th July 2022

Time: 9:30 AM to 12:30 PM

Max Marks: 100

Weightage: 50%

Instructions:

(i) *Read the all questions carefully and answer accordingly.*

(ii) x

Part A [Memory Recall Questions]

**Answer all the Questions. Each question carries SIX marks.
30M)**

(5Qx 6M=

Q.NO.1 Briefly explain the need for Rapid Prototyping.
level]

(C.O.No.1) [K

Q.NO.2 What are the advantages and disadvantages of SLA?
level]

(C.O.No.2) [K

Q.NO.3 Discuss about Photo Polymerization.
level]

(C.O.No.3) [K

Q.NO.4 What are the materials suitable for FDM Process?
level]

(C.O.No.3) [K

Q.NO.5 Differentiate between Soft & Hard tooling.
level]

(C.O.No.3) [K

Part B [Thought Provoking Questions]

**Answer all the Questions. Each question carries TEN marks.
(4Qx10M=40M)**

Q.NO.6 3D printing is an additive process whereby layers of material are built up to create a 3D part. This is the opposite of subtractive manufacturing processes, where a final design is cut from a larger block of material. As a result, 3D printing creates less material wastage. Explain in detail about process details and machine details of 3-D printing.

(C.O.No.3)

[C level]

Q.NO.7 Raster and perimeter based tool path is generally used by most of the AM machines. An algorithm has been presented and implemented successfully to generate the raster and perimeter based tool path for performing additive manufacturing on the CNC milling machine. Developed tool path has potential to fabricate 3D parts. What are the techniques used in Tool path generation?

(C.O.No.5) [C

level]

Q.NO.8 Selective laser sintering (SLS) is an additive manufacturing (AM) technique that uses a laser as the power and heat source to sinter powdered material (typically nylon or polyamide), aiming the laser automatically at points in space defined by a 3D model, binding the material together to create a solid structure. Explain how SLS process can be used to produce direct and in-direct prototypes.

(C.O.No.4)

[C level]

Q.NO.9 Stereo lithography (SLA) is an additive manufacturing process that belongs to the vat photo polymerization family. Also known as resin 3D printing, there are three main 3D printing technologies associated with vat polymerization. What are the part building and post building process involved in SLA?

(C.O.No.4) [C

level]

Part C [Problem Solving Questions]

Answer both the Questions. Each question carries FIFTEEN marks.

(2Qx15M=30M)

Q.NO.10 Write short notes on these RP tooling A) Casting mold B) Single point cutting tool.

(C.O.No. 3) [C level]

Q.NO.11 Explain the effect of part building, part finishing and part deposition orientation on accuracy of rapid prototyping model.

(C.O.No. 2) [A level]