Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech.**
PME4D003

4th Semester Regular / Back Examination 2017-18
RAPID MANUFACTURING PROCESS
BRANCH : MECH
Time : 3 Hours
Max Marks : 100
Q.CODE : C1163

Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

Part – A (Answer all the questions)

Q1 **Answer the following questions:*multiple type or dash fill up type:*** **(2 x 10)**

a) Which one of the following is not related to rapid prototyping definition?
(a) Layer by layer (b) physical model
(c) from 3D CAD data (d) production line

b) Which one of the process does not use a LASER?
(a) LOM (b) SLA (c) SLS (d) FDM

c) Which of the process is available in colors?
(a) SLA (b) FDM (c) MJM (d) 3D printer

d) What is the format for prototyping machine file?
(a) .prt (b) .slt (c) .stl (d) .iges

e) Which one of the process is subtractive prototyping?
(a) 5 axis CNC milling (b) Fused Deposition Modeling
(c) Multi Jet Modeling (d) Stereolithography Apparatus

f) In which of the process, the input material is in liquid form?
(a) MJM (b) SLS (c) FDM (d) LOM

g) Which of the process uses extrusion concept?
(a)SLA (b) SLS (c) LOM (d) FDM

h) The depth of curing by laser beam in RP depends on --------- and the properties of the liquid used.

i) Slicing is ------ processing work in RP.

j) A computer model of a part design on a CAD system is called ------- prototype.

Q2 **Answer the following questions: *Short answer type:*** **(2 x 10)**

a) Explain the types of prototypes at different stages of a product development cycle?

b) How is the generation of mathematical layer information different from the generation of physical layer model?

c) What is magic communicator?

d) What is reverse engineering? Give two applications of Reverse Engineering?

e) Why polymer materials are used for rapid prototyping system?

f) What is the importance of support design in rapid prototyping?

g) What do you mean by slicing, internal hatching and surface skin fills?

h) What are voxels in Stereolithography process? Explain with a neat sketch.

i) What is the principle of sinter bonding?

j) Why powder based RP systems do not require support structures?

Part – B (Answer any four questions)

Q3	**a)**	Explain in details the role of RP in batch production?	**(10)**
	b)	Explain in details the concept of Reverse Engineering.	**(5)**
Q4	**a)**	Describe in details the data preparation errors, part building errors and finishing errors in RP.	**(10)**
	b)	Explain different factors affecting accuracy in RP system.	**(5)**
Q5	**a)**	Classify the various GMPs based on raw materials and layering techniques.	**(10)**
	b)	How can you differentiate MAGICS and MIMICS?	**(5)**
Q6	**a)**	Explain Selective Laser Sintering (SLS) process with a neat sketch. Also write its advantages, limitations and applications.	**(10)**
	b)	What are the process parameters and materials used for SLS?	**(5)**
Q7	**a)**	Explain Laminated Object Manufacturing (LOM) process with a neat sketch. Also write its advantages, limitations and applications.	**(10)**
	b)	What is Solid Ground Curing? What is a mask in SGC and how it is used?	**(5)**
Q8	**a)**	Explain the working principle and the process parameters of Stereolithography process with a neat sketch. Also write its advantages, limitations and applications.	**(10)**
	b)	What is triangulation? Explain data preparation for SLA.	**(5)**
Q9	**a)**	Explain in details the Holographic Interference Solidification in RP using metallic alloy.	**(10)**
	b)	Describe the working principle of Beam Interference Solidification.	**(5)**