Code No: **R164103C** **R16** **Set No. 1**

IV B.Tech I Semester Regular/Supplementary Examinations, March - 2021

ADDITIVE MANUFACTURING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
****

PART–A *(14 Marks)*

1.	a)	Define prototype. What is its need?	[2]
	b)	What is solid based RP?	[3]
	c)	Write any two applications of SLS?	[2]
	d)	What is indirect Rapid Tooling?	[2]
	e)	Name various RP softwares.	[3]
	f)	Write the applications of RP in automotive industry.	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	Explain the historical development of Rapid Prototyping.	[7]
	b)	How liquid based RP differs from that of powder based RP?	[7]
3.	a)	Explain the sequential steps involved in LOM process.	[7]
	b)	Write the case studies of FDM process.	[7]
4.	a)	Discuss the materials used in SLS process?	[7]
	b)	What are the applications of 3D printing?	[7]
5.	a)	Explain the process of 3D keltool in brief.	[7]
	b)	Write and explain about EOS direct tool process?	[7]
6.	a)	How the problem of “MISSING FACETS” is solved using generic solution?	[7]
	b)	Explain various features of Mimics and View expert.	[7]
7.	a)	Write the applications of RP in engineering.	[7]
	b)	Write the applications of additive manufacturing in forensic and anthropology.	[7]

Code No: **R164103C** **R16** **Set No. 2**

IV B.Tech I Semester Regular/Supplementary Examinations, March - 2021

ADDITIVE MANUFACTURING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1.	a)	Why RP is called as additive manufacturing?	[2]
	b)	What is LOM?	[2]
	c)	How SLS differs from 3D printing?	[3]
	d)	What is direct rapid tooling?	[2]
	e)	What are the general errors that usually generate in STL?	[3]
	f)	Write any two applications of RP in coin industry.	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	Explain the fundamentals of rapid prototyping?	[7]
	b)	What are the advantages and limitations of SLA? Explain in brief.	[7]
3.	a)	Write the applications of LOM.	[7]
	b)	Explain the principle of FDM and what are the materials used in FDM process?	[7]
4.	a)	What are the major applications of SLS?	[7]
	b)	What are the advantages and limitations of 3DP?	[7]
5.	a)	What is RT? What is the need of RT in additive manufacturing?	[7]
	b)	Explain the process of direct metal tooling using 3DP	[7]
6.	a)	Write about STL file formats.	[7]
	b)	Eexplain about 3D view, velocity 2 and 3D doctor.	[7]

7. How RP is applied in
   (i) arts and architecture
   (ii) visualization of bimolecular
   (iii) GIS application [14]

Code No: **R164103C** **R16** **Set No. 3**

IV B.Tech I Semester Regular/Supplementary Examinations, March - 2021

ADDITIVE MANUFACTURING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1.	a)	What is virtual or soft prototyping?	[2]
	b)	Write any two differences between LOM and SLA?	[3]
	c)	What is powder based RP?	[3]
	d)	Name some indirect rapid tooling techniques.	[2]
	e)	What is generic solution in STL problems?	[2]
	f)	Write any two applications of RP in analysis planning.	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	Write the direct and indirect benefits of RP?	[7]
	b)	Explain the principle behind SLA process in brief.	[7]
3.	a)	What are the advantages and limitations of LOM?	[7]
	b)	Explain the process of FDM with two applications.	[7]
4.	a)	Explain the principle of SLS in brief.	[7]
	b)	Write the specifications of 3DP and write a case study of 3DP?	[7]
5.	a)	Write any seven differences between conventional tooling and rapid tooling?	[7]
	b)	What is DTM rapid tooling process? Explain.	[7]
6.	a)	What are newly proposed data formats in RP?	[7]
	b)	Explain the Rhino, STL view 3Data expert softwares.	[7]
7.	a)	Write the applications of additive manufacturing in following industries (i) automotive industry (ii) customized implant and prosthesis	[7]
	b)	Write the applications of RP in following industries (i) aerospace industry (ii) simulation of complex surgeries	[7]

Code No: **R164103C** **R16** **Set No. 4**

IV B.Tech I Semester Regular/Supplementary Examinations, March - 2021

ADDITIVE MANUFACTURING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1.	a)	What is photo polymerization?	[3]
	b)	Write any two applications of FDM.	[2]
	c)	Why is 3DP most trending RP in powder based RP?	[3]
	d)	Name some direct rapid tooling techniques.	[2]
	e)	Explain 3D doctor software.	[2]
	f)	Writ any two applications of RP in medical industry.	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	How the classification of additive manufacturing is done? Explain the classification of RP with a tree diagram.	[7]
	b)	Explain the process of SLA with a neat sketch.	[7]
3.	a)	What is the principle of LOM? Enumerate?	[7]
	b)	What are the advantages and applications of FDM process?	[7]
4.	a)	What are the advantages and disadvantages of SLS over other RP processes?	[7]
	b)	Explain the process of 3DP.	[7]
5.	a)	Explain in brief about spray metal deposition indirect RT process.	[7]
	b)	Write and explain direct AIM process.	[7]
6.	a)	What are general STL file problems?	[7]
	b)	What are the features of Magics, solid view?	[7]
7.		What are the applications of RP in various industries?	[14]