Hall Ticket No | | | | | | | | | | | Question Paper Code: BCCB08

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER-1

M.Tech I Semester End Examinations, January - 2020

Regulations: IARE - R18

RAPID PROTOTYPE TECHNOLOGIES

(CAD/CAM)

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

Answer ONE Question from Each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT-I

1	(a)	Summarize the key aspect of rapid prototyping. Explain With an example the historical development of rapid prototype technology.	[7M]
	(b)	Categorize of applications in rapid prototype technology in manufacturing industries and also compare rapid prototype technology with computer numerical control technology.	[7M]
2	(a)	Specify and explain the different process, parameters of SLA technique, the different material which may used in manufacturing of products in SLA technique	[7M]
	(b)	Explain with a neat sketch, principle of operation of Selective Laser Sintering Process.	[7M]

UNIT-II

3.	(a)	Compose the principles behind stereo litho sintering process. Briefly explain the materials used in stereo litho sintering.	[7M]
	(b)	Describe in detail about Narrate Laminated Object manufacturing with a neat sketch.	[7M]
4.	(a)	Explain the concept modeling? Explain the application of rapid prototyping component from concept modeling and describe any three geometric modeling techniques.	[7M]
	(b)	Explain with a neat sketch the following concept of modeling technique. (i) Sander's model maker. (ii) 3D Printer.	[7M]

UNIT-III

5.	(a)	What is rapid tooling? Discuss the process of making a rapid tool for blow moulding assume your example as product.	[7M]
	(b)	Explain with a neat sketch the following indirect techniques (i) Aluminum filed epoxy tooling. (ii) Spray metal tooling	[7M]

6. (a) Which rapid prototyping processes are best suited for production of ceramic parts. [7M]
   (b) What are the limitations and advantages of fused deposition modeling process Describe 3D Printing process with a neat sketch. [7M]

UNIT-IV

7. (a) Write short notes on the following. [7M]
   (i) Influence of building orientation. (ii) File exchange errors. (iii) Errors in SH files. (iv) Part building errors.
   (b) Explain the procedure of modeling, SH file creation and layering steps before printing 3D model in RP machine for the following types of models [7M]
   (i) Economical model. (ii) Precision Model

8. (a) Differentiate soft tooling and hard tooling. Compare direct tooling and indirect tooling. [7M]
   (b) Explain Arc spray metal tooling with a neat sketch. [7M]

UNIT-V

9. (a) Explain the applications of rapid prototyping. Summarize the applications in engineering, analysis, aerospace industry, medical and bioengineering. [7M]
   (b) Categorize the applications of rapid prototyping in the areas of planning and simulation of complex surgery, customized implants, design and production of medical devices. [7M]

10. (a) Discuss with a case study in medical application. Describe how reverse engineering will be applied to rapid prototyping techniques. [7M]
   (b) Categorize how the material relationship will contribute in rapid prototype technique, specify the applications in forensic science and anthropology. [7M]

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COURSE OBJECTIVES (COs):
The course should enable the students to:

I	Describe product development, conceptual design and classify rapid prototyping systems; explain stereo lithography process and applications
II	Identify The process photopolymers, photo polymerization, layering technology, laser and laser scanning
III	Applying of measurement and scaling technique for prototype manufacturing.

COURSE OUTCOMES (COs):

CO1	Describe product development, conceptual design and classify rapid prototyping systems; explain stereo lithography process and applications.
CO2	Identify The process photopolymers, photo polymerization, layering technology, laser and laser scanning.
CO3	Applying of measurement and scaling technique for prototype manufacturing.
CO4	Identify the Rapid Prototyping Data Formats
CO5	Application for powder based rapid prototyping systems

COURSE LEARNING OUTCOMES (CLOs):
Students, who complete the course, will have demonstrated the asking to do the following:

BCCB08.01	Identify and understand of basic concepts of Rapid prototyping technologies
BCCB08.02	Understand and Apply concepts of Rapid prototyping
BCCB08.03	Classify the rapid prototyping systems
BCCB08.04	Understand the different Models and specifications
BCCB08.05	Understand the selection of manufacturing method
BCCB08.06	Identify the Layering Technology, Applications.
BCCB08.07	Understand the different models and specifications
BCCB08.08	Classify the Rapid Tooling systems
BCCB08.09	Understand the Powder Based Rapid Prototyping Systems
BCCB08.10	Identify the Rapid Prototyping Data Formats
BCCB08.11	Understand the Rapid Prototyping Software's
BCCB08.12	Identify the Newly Proposed Formats
BCCB08.13	Application for powder based rapid prototyping systems
BCCB08.14	Application in Design and Engineering
BCCB08.15	Design and Production of Medical Devices, Forensic Science and Anthropology

MAPPING OF SEMESTER END EXAMINATION TO COURSE LEARNING OUTCOMES

SEE Question No		Course Learning Outcomes (CLOs)		Course Outcomes	Blooms Taxonomy Level
1	a	BCCB08.01	Identify and understand of basic concepts of Rapid prototyping technologies	CO 1	Remember
	b	BCCB08.02	Understand and Apply concepts of Rapid prototyping	CO 1	Remember
2	a	BCCB08.01	Identify and understand of basic concepts of Rapid prototyping technologies	CO 1	Remember
	b	BCCB08.03	Classify the rapid prototyping systems	CO 1	Remember
3	a	BCCB08.04	Understand the different Models and specifications	CO 2	Remember
	b	BCCB08.05	Understand the selection of manufacturing method	CO 2	Remember
4	a	BCCB08.05	Understand the selection of manufacturing method	CO 2	Understand
	b	BCCB08.06	Identify the Layering Technology, Applications.	CO 2	Understand
5	a	BCCB08.07	Understand the different models and specifications	CO 3	Remember
	b	BCCB08.08	Classify the Rapid Tooling systems	CO 3	Remember
6	a	BCCB08.08	Classify the Rapid Tooling systems	CO 3	Understand
	b	BCCB08.09	Understand the Powder Based Rapid Prototyping Systems	CO 3	Understand
7	a	BCCB08.10	Identify the Rapid Prototyping Data Formats	CO 4	Understand
	b	BCCB08.11	Understand the Rapid Prototyping Software's	CO 4	Understand
8	a	BCCB08.12	Identify the Newly Proposed Formats	CO 4	Understand
	b	BCCB08.13	Application for powder based rapid prototyping systems	CO 4	Understand
9	a	BCCB08.13	Application for powder based rapid prototyping systems	CO 5	Understand
	b	BCCB08.14	Application in Design and Engineering	CO 5	Understand
10	a	BCCB08.14	Application in Design and Engineering	CO 5	Remember
	b	BCCB08.15	Design and Production of Medical Devices, Forensic Science and Anthropology	CO 5	Remember

Signature of Course Coordinator **HOD, ME**