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

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

M.Tech I Semester End Examinations (Regular) - January, 2019

Regulation: IARE–R18

RAPID PROTOTYPE TECHNOLOGIES

Time: 3 Hours **(CAD/CAM)** **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) Discuss the historic development of rapid prototyping technique with a suitable example. List down the prime aspects of rapid prototyping. **[7M]**

   (b) List the applications of rapid prototyping techniques in manufacturing. Compare and contrast rapid prototyping technology with computer numerical control technology. **[7M]**

2. (a) State and explain the three fundamental automated processes and the elements of process chain. **[7M]**

   (b) Describe the classification of rapid prototyping systems. **[7M]**

UNIT – II

3. (a) Describe the construction and working of solid ground curing technique(SGC) in rapid prototyping process. List the governing parameters. Mention any two raw materials that are suitable to be used in the process. **[7M]**

   (b) Compare and contrast stereolithography with solid ground curing technique. Include cost factors and size factors too. **[7M]**

4. (a) Discuss the construction and working of fused deposition modelling technique in additive manufacturing process. List the governing parameters. Mention any two raw materials that are suitable to be used in the process. **[7M]**

   (b) Explain the advantages, disadvantages and limitations of liquid-based to solid-based rapid prototyping systems. Mention an example for each prototyping system. **[7M]**

UNIT – III

5. (a) Explain with a suitable example direct rapid tooling and indirect rapid tooling. **[7M]**

   (b) Assuming a component, develop a rapid tooling setup for blow moulding operation. **[7M]**

6. (a) Take an example of your choice and explain how to generate that using three dimensional printing. Mention the advantages and disadvantages of three dimensional printing. State any one model of three dimensional printing machine and its specification. **[7M]**

   (b) Explain the construction and working principle of selective laser sintering technique. List the governing parameters. Mention any two applications of this technique. **[7M]**

UNIT – IV

7. (a) It is required to generate a precision model. Discuss the procedure of modelling, STL file creation and layering steps before starting the 3D printing operation in a rapid prototyping machine. **[7M]**

   (b) List the three types of errors that can creep in the process of rapid prototyping. Explain each of them. **[7M]**

8. (a) Bring out the various features of rapid prototyping software. Relate how those features are incorporated in softwares like Rhino and Solid View. **[7M]**

   (b) List any two newly proposed rapid prototyping data formats and describe them in detail. **[7M]**

UNIT – V

9. (a) List the applications of rapid prototyping in the field of Jewellery and Art/Architecture industries. Mention the reasons for opting rapid prototyping technique in the above said applications. **[7M]**

   (b) Discuss the influence of material relationships in rapid prototyping citing various engineering applications. **[7M]**

10. (a) List out and describe rapid prototyping in Medical and Bioengineering applications. **[7M]**

    (b) Mention the various applications of rapid prototyping in aerospace and automotive industry. State the importance of RPT in those fields. **[7M]**

– ○ ○ ◯ ○ ○ –