

INSTITUTE OF AERONAUTICAL ENGINEERING
(AUTONOMOUS)

Code No: **AHS008**

MODEL QUESTION PAPER - II

M.Tech I Semester Regular Examinations, February 2016

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

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UNIT-I

- 1 (a) Explain three phases of prototyping. Discuss the need of rapid prototyping techniques. [7M]
Evolution of rapid prototyping techniques and their history and growth rate industrial sector
- (b) Describe the advantages of Rapid Prototyping in terms of its beneficiaries such as the product designers, tool designer, manufacturing engineer, marketers and consumers. [7M]
- 2 (a) Describe the five steps involved in a general RP process chain and distinguish cleaning, post curing and finishing which are the various tasks of post processing [7M]
- (b) Explain three types of automated fabricators. Describe them and give two examples each. [7M]

UNIT-II

3. (a) Compare and contrast the laser-based stereo lithography systems and the solid ground curing systems. Specify the advantages and disadvantages for each of the systems. [7M]
- (b) Explain in details the working principle of solid ground curing models with its advantages and disadvantages. Differentiate SLA and SLS in rapid prototyping. [7M]
4. (a) Explain merits and demerits of Laminated object manufacturing. Describe the principle of FDM with its advantages, disadvantages and applications. [7M]
- (b) Explain solid based rapid prototyping systems and laminated object manufacturing model and its working principle. [7M]

UNIT-III

5. (a) Explain the critical factors that influence the performance and functions of Selective Laser Sintering and 3-Dimensional printing. [7M]
- (b) Discuss the advantage and disadvantage of powder based rapid prototyping system and compare with liquid based and solid based rapid prototyping systems. [7M]

6. (a) Explain rapid tooling and discuss the investing casting process with neat sketch. [7M]
Compare merits and demerits of investment casting process.
- (b) Discuss the various metal deposition tools with example. Explain the RTV and Epoxy [7M]
tools with their advantages and disadvantages.

UNIT-IV

7. (a) Explain the STL format. Discuss the Generic and dedicated solution with example. [7M]
- (b) Explain the procedure of modeling, SH file creation and layering steps before printing [7M]
3D model in RP machine for the following types of models
- (i) Economical model.
- (ii) Precision Model
8. (a) Differentiate soft tooling and hard tooling. Compare direct tooling and indirect tooling. [7M]
- (b) Explain the futures of RP software and summarize about solid view, view expert, 3D [7M]
view and STL view in detail.

UNIT-V

9. (a) Explain the applications of rapid prototyping. Summarize the applications in coin [7M]
making, coin industry, GIS application.
- (b) Categorize the applications of rapid prototyping in the areas of customized implants and [7M]
prosthesis, visualization of biomolecules.
10. (a) Discuss with a case study in automobile application. Describe how reverse engineering [7M]
will be applied to rapid prototyping techniques.
- (b) Categorize how the material relationship will contribute in rapid prototype technique. [7M]
Specify the applications in aerospace industry.