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Question Paper Code: 42212

M.E. DEGREE EXAMINATION, MAY 2015.

Second Semester

CAD / CAM

14PCD202 - ADDITIVE MANUFACTURING

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (5 x 1 = 5 Marks)

- Which type of model is likely to be created with rapid prototyping systems?
(a) Mathematical model (b) Wireframe model
(c) Surface model (d) Scale model
- Which Boolean operation is sensitive to the order of the operands?
(a) Difference (b) Union (c) Divisor (d) Intersection
- Which one of the following process is extrusion based AM systems
(a) SLA (b) FDM (c) SLS (d) LENS
- This type of rapid prototyping systems uses a laser to fuse powdered metals, plastics, or ceramics:
(a) Fused deposition modeling (b) Stereolithography apparatus
(c) Solid ground curing (d) Selective laser sintering
- Selective laser melting use _____ type of lasers.
(a) CO₂ (b) Ruby (c) Quartz (d) Ytterbium

PART - B (5 x 3 = 15 Marks)

6. What is the main characteristic of additive manufactured parts?
7. What is meant by adaptive slicing?
8. Define: photo polymerization.
9. Weather supports are necessary for selective laser sintering process? Why?
10. Why should a 3D printing part (powder-binder-process) not be taken for structural tests?

PART - C (5 x 16 = 80 Marks)

11. (a) (i) Explain the steps involved in additive manufacturing processes. (8)
(ii) Explain the role of Additive Manufacturing (AM) with respect to product cycle time on product development. (8)

Or

- (b) Write short notes on the following terms
(i) Virtual Prototyping (8)
(ii) Rapid Tooling (8)
12. (a) Describe about various geometric modeling techniques in CAD model preparation. (16)

Or

- (b) (i) What is meant by slice Resolution and Slice units? Describe the process of model slicing. (8)
(ii) Write about part orientation and support generation to obtain optimum usage of materials. (8)
13. (a) Explain the sequence of steps for Stereo lithography process with neat sketches. List down its advantages and limitations. (16)

Or

- (b) With neat sketch, explain the construction and working principle of Fusion Deposition Modelling (FDM) process by giving emphasis to part materials and support materials. (16)

14. (a) Explain, with suitable sketch, the process of manufacturing a prototype of circular disc made of ceramic material. (16)

Or

- (b) Explain the working principle of Laser Engineering Net Shaping (LENS) process. (16)

15. (a) (i) Explain why support structures are not needed in the 3DP process. (8)
(ii) Classify the Three dimensional printing (3DP), explain any one type of the system. (8)

Or

- (b) Discuss the following processes with neat sketch

- (i) Ballistic Particle Manufacturing (8)
(ii) Electron Beam Melting (8)
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