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17ME82

Eighth Semester B.E. Degree Examination, July/August 2021 Additive Manufacturing

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

1.
 - a. Define additive manufacturing. Justify why additive manufacturing is so important in modern days. (07 Marks)
 - b. Explain the additive manufacturing process chain. (06 Marks)
 - c. Give the detailed classification of AM processes. (07 Marks)

2.
 - a. With a neat sketch, explain the working principle of Stereolithography process. (08 Marks)
 - b. Discuss the post processing of AM parts. (07 Marks)
 - c. Write the applications of AM parts. (05 Marks)

3.
 - a. Explain the importance of system drives and devices in AM machines. (06 Marks)
 - b. With a neat sketch, explain the working of DC electric motor. (07 Marks)
 - c. Give the detailed classification of hydraulic and pneumatic motors. (07 Marks)

4. Write short notes on :
 - i) Solenoids
 - ii) Diodes and Thyristors
 - iii) Triacs
 - iv) Piezoelectric actuators
 - v) Application of shape memory. (20 Marks)

5.
 - a. Give the detailed classification of polymers. (04 Marks)
 - b. Explain the concept of
 - i) Functionality
 - ii) Polydispersity and molecular weight
 - iii) Molecular weight distribution (06 Marks)
 - c. Explain with neat sketch :
 - i) Wet Spinning
 - ii) Dry Spinning. (10 Marks)

6.
 - a. Define Powder Metallurgy. Explain the different powder production techniques. (07 Marks)
 - b. Explain the importance particle size, and shape distribution, interparticle friction and compression ability on the quality of PM parts. (08 Marks)
 - c. Give the detailed applications of powder metallurgy. (05 Marks)

7.
 - a. Explain with relevant sketches
 - i) Bottom – up
 - ii) Top down Approaches of nanotechnology. (06 Marks)
 - b. Explain the synthesis of nanomaterials
 - i) Solgel process
 - ii) Chemical Vapour Condensation (CVC) (08 Marks)
 - c. Give the applications of Nanotechnology. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.



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- 8 a. With a neat sketch, explain Transmission Electron Microscopy (TEM). List the application. (10 Marks)
b. With a neat sketch, explain Atomic Force Microscopy (AFM) – List the application. (10 Marks)
- 9 a. Give the detailed classification of CNC machine tools. (10 Marks)
b. Explain the NC words used in manual part programming. (10 Marks)
- 10 a. Define Automation. Explain the basic elements of an automated system. (10 Marks)
b. Explain the need of Automation in productivity. (04 Marks)
c. Write short notes on :
i) Continuous and Discrete control
ii) Control System components. (06 Marks)

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