

CBCS SCHEME

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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)

- 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)
