

Exam Date & Time: 15-Jan-2024 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

MIT MPL and BLR - BTech I-III-V and VII Semester - End Semester Makeup Examination - Jan 2024

3D PRINTING AND DESIGN [MIE 2129]

Marks: 50

Duration: 180 mins.

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

- 1) Illustrate the working principles of Fused deposition moulding (FDM) process and highlight its process parameters (5)
 - A)
 - B) Summarize the application of additive manufacturing in Defence, medical and consumer goods with their specific advantages (3)
 - C) Describe the steps involved in the additive manufacturing process (2)
- 2) Sketch and describe the melt spinning process of manufacturing polymer fibre (5)
 - A)
 - B) Describe the water atomization mechanism of powder manufacturing technique (3)
 - C) Compare laser bed fusion and electron beam melting process (2)
- 3) Sketch and discuss the working principle of direct energy deposition process (5)
 - A)
 - B) Sketch and discuss the working principal of Aerosol direct writing process (3)
 - C) Distinguish between Selective laser sintering (SLS) and stereolithography (SLA) techniques (2)
- 4) With neat sketch explain working principle of laser-based powder bed fusion technique (5)
 - A)
 - B) Describe the post processing of AM parts (3)
 - C) Discuss the importance of microstructural characterization techniques (2)

- 5) Sketch and describe working process of Optical Microscope (5)
- A)
- B) Identify and describe any three destructive methods of analysing AM parts (3)
- C) Interpret the remedies for common defects observed within AM components (2)

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