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Question Paper Code:U3909

M.E. DEGREE EXAMINATION, NOV 2024

Professional Elective

CAD / CAM

21PCD509-ADDITIVE MANUFACTURING

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1. (a) Examine how additive manufacturing (AM) influences traditional product development, particularly in prototyping and tooling practices. CO1- App (20)

Or

- (b) Explain the diverse applications of additive manufacturing (AM) across industries, including bioprinting, and provide case studies to identify AM's unique benefits in these fields. CO1- App (20)

2. (a) Describe the challenges encountered in the design phase of series production when using additive manufacturing. CO3- App (20)

Or

- (b) Utilize topology optimization in Design for Additive Manufacturing (DFAM) to enhance the development of lightweight structures and evaluate its impact on material usage. CO3- App (20)

3. (a) How can the principles of stereolithography apparatus (SLA) be applied to improve product development? Explain its working mechanism and outline its advantages and disadvantages. CO4- App (20)

Or

- (b) How can the principles of Ultrasonic Additive Manufacturing (UAM) be applied in the aerospace industry to manufacture lightweight components? Explain its working mechanism and outline its advantages and disadvantages. CO4- App (20)

4. (a) Identify how Selective Laser Sintering (SLS) can be used for fabricating complex geometries in customized industrial components and outline its working principle. CO4- App (20)
- Or
- (b) How can Laser Engineered Net Shaping (LENS) be applied to repair damaged aerospace components? Explain in detail. CO4- App (20)
5. (a) How can Ballistic Particle Manufacturing (BPM) be applied in the production of defense-related components? CO4- App (20)
- Or
- (b) Evaluate the strengths and weaknesses of Shape Deposition Manufacturing (SDM) in the context of high-precision manufacturing. CO4- App (20)