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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Mechanical Engineering

Semester End Examination; Aug. / Sep. - 2020

Additive Manufacturing Techniques

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Time: 3 hrs

Max. Marks: 100

Note: i) Answer **TWO** full questions, selecting **ONE** full question from **UNIT - I** and **UNIT - II**.

ii) Answer any **THREE** full questions, choosing from **UNIT - III**, **UNIT - IV** and **UNIT - V**.

UNIT - I

- 1 a. Explain the need for the compression in product development. . 6
- b. Discuss history and evolution of AM systems. 10
- c. List advantages and disadvantages of AM systems. 4

OR

- 2 a. Explain principle, process parameters and process details of stereo lithography process with a neat sketch. 10
- b. Explain Solid Ground Curing process with a neat sketch. 10

UNIT - II

- 3 a. Explain principle of operation, process parameters, merits, demerits of Selective Laser Sintering (SLS) process with neat sketch. 10
- b. Explain Laser Engineering Net Shaping Process (LENS) with a neat sketch. 10

OR

- 4 a. Explain Laminated Object Manufacturing process (LOM) with respect to principle of operation, LOM materials, process parameters, process details, merits, demerits and applications. 10
- b. Explain with a neat sketch Fused Deposition Modelling (FDM) process. 10

UNIT - III

- 5 a. Explain functional models and pattern for investment and vacuum casting. 10
- b. Explain briefly Art, Medical and Engineering Analysis models in AM systems. 10
- 6 a. Explain Thermal Jet printer and Sander's Model maker briefly with neat sketches. 10
- b. Explain briefly JP System 5 and Object Quadra Systems with sketches. 10

UNIT - IV

- 7 a. Explain Silicone Rubber tooling process with neat sketches. 10
- b. Explain Aluminum filled epoxy tooling with neat sketches. 10
- 8 a. Explain direct rapid tooling and direct AIM. 8
- b. Explain Sand Cast Tooling with neat sketches. 12

UNIT - V

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| 9 a. | Explain all the factors that influence accuracy. | 8 |
| b. | Explain data preparation errors and errors due to tessellation and slicing. | 12 |
| 10 a. | Explain Part building errors in SL and SLS process. | 12 |
| b. | Explain errors in finishing. | 8 |

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