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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| Date: 07 – 01- 2025 Time: 09:30 am – 12:30 pm |

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| --- | --- | --- |
| **School:** School of Engineering | **Program:** B. Tech – Mechanical Engineering | |
| **Course Code:** MEC3002 | **Course Name:** Introduction to Additive Manufacturing and Its Applications | |
| **Semester**: VII | **Max Marks**: 100 | **Weightage**:50% |

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| --- | --- | --- | --- |
| **CO - Levels** | **CO1** | **CO2** | **CO3** |
| **Marks** | **26** | **38** | **36** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Answer ALL the Questions. Each question carries 2marks. 2Mx10Q=20M** | | | | |
| **1** | What is prototype? | **2 Marks** | **L1** | **CO1** |
| **2** | List out the advantages of Additive Manufacturing (AM). | **2 Marks** | **L1** | **CO1** |
| **3** | What are the other names of Additive manufacturing? | **2 Marks** | **L1** | **CO1** |
| **4** | What are the uses of post processing of AM Parts? | **2 Marks** | **L1** | **CO2** |
| **5** | What are the unique capabilities of AM? | **2 Marks** | **L1** | **CO2** |
| **6** | What are multi-functional designs? | **2 Marks** | **L1** | **CO2** |
| **7** | Define Design for Manufacture and Assembly(DFAM). | **2 Marks** | **L1** | **CO2** |
| **8** | List out the medical application of Additive manufacturing | **2 Marks** | **L1** | **CO3** |
| **9** | What are the post processing operation carried out in 3D printing | **2 Marks** | **L1** | **CO3** |
| **10** | What are the three elements of decision theory | **2 Marks** | **L1** | **CO3** |

**Part B**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Answer ALL Questions. Each question carries 20 marks. 4QX20M=80M** | | | | | |
| **11** | **11a** | With simple sketch Explain the working principle of Stratasys Fused Deposit Modelling (FDM) process of Additive manufacturing process. | **10 Marks** | **L2** | **CO1** |
| **11b** | Explain the generic manufacturing process in 3D printing | **10 Marks** | **L2** | **CO1** |
| **Or** | | | | | |
| **12** | **12a** | Write a short note on molten material system and solid sheet system | **10 Marks** | **L2** | **CO1** |
| **12b** | With simple diagram explain the 3D systems’ Selective laser Sintering process with its applications | **10 Marks** | **L2** | **CO1** |
|  |  |  |  |  |  |
| **13** | **13a** | Write a short note on design for AM  (a) Interlocking Features (b) Part orientation | **10 Marks** | **L2** | **CO2** |
| **13b** | Explain the unique capabilities of AM techniques & List out the objectives of DFMA in AM process. | **10 Marks** | **L2** | **CO2** |
| **Or** | | | | | |
| **14** | **14a** | Explain the classification of Design for manufacturing (DFM)used in AM. | **10 Marks** | **L2** | **CO2** |
| **14b** | Describe the part consolidation and redesign of Additive manufacturing by taking any example | **10 Marks** | **L2** | **CO2** |
|  |  |  |  |  |  |
| **15** | **15a** | Post processing techniques is basically employed to enhance the properties of AM products. Explain any four post processing techniques used in AM | **10 Marks** | **L2** | **CO2** |
| **15b** | Describe any two surface texture improvement techniques used in AM in brief. | **10 Marks** | **L2** | **CO2** |
| **Or** | | | | | |
| **16** | **16a** | Explain the challenges of process selection in Additive manufacturing | **10 Marks** | **L2** | **CO3** |
| **16b** | Explain the 7 attributes that evaluate the quality of product that is produced by Additive Manufacturing process | **10 Marks** | **L2** | **CO3** |
|  |  |  |  |  |  |
| **17** | **17a** | Entrepreneurship is associated with uncertainty because it involves introducing a new idea**.** Explain the digiproneurship with new product development concept | **10 Marks** | **L2** | **CO3** |
| **17b** | Write a short note on production planning and control in Additive manufacturing | **10 Marks** | **L2** | **CO3** |
| **Or** | | | | | |
| **18** | **18a** | Explain the aerospace application by taking an examples of components manufactured by AM techniques and its advantages | **10 Marks** | **L2** | **CO3** |
| **18b** | Explain the concept of Direct Digital Manufacturing System (DDMS) operation used in Additive manufacturing . | **10 Marks** | **L2** | **CO3** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***