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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| **Date:** 11-01-2025 **Time:** 01:00 pm – 4:00 pm |

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| --- | --- | --- |
| **School:** SOE | **Program:** B. Tech – MEC/MCM | |
| **Course Code**: MEC3009 | **Course Name:** Nanotechnology | |
| **Semester**: III | **Max Marks**: 100 | **Weightage**:50% |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** |
| **Marks** | **24** | **26** | **26** | **24** |

**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** | Define the term nanoscience | **2 Marks** | **L1** | **CO1** |
| **2** | Outline the different methods of preparation of Nano fluids | **2 Marks** | **L1** | **CO1** |
| **3** | State some of the applications of quantum dots | **2 Marks** | **L1** | **CO2** |
| **4** | State some of the properties of fullerene | **2 Marks** | **L1** | **CO2** |
| **5** | State the different classifications of Nano materials based on dimensions | **2 Marks** | **L1** | **CO3** |
| **6** | Outline any two advantages of using High energy ball milling in synthesizing nano materials | **2 Marks** | **L1** | **CO3** |
| **7** | Name few techniques used for characterizing nanomaterials | **2 Marks** | **L1** | **CO4** |
| **8** | State any 2 benefits of using Energy dispersive spectroscopy in the field of nanotechnology | **2 Marks** | **L1** | **CO4** |
| **9** | Outline 2 advantages of using graphene | **2 Marks** | **L1** | **CO2** |
| **10** | State two key applications of CVD in nanotechnology | **2 Marks** | **L1** | **CO3** |

**Part B**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Answer ALL Questions. Each question carries 20 marks. 4QX20M=80M** | | | | | |
| **11** | **11a** | Describe briefly about the history of nanomaterials | **10Marks** | **L1** | **CO1** |
| **11b** | Explain briefly the benefits of nanotechnology in engineering field | **10Marks** | **L1** | **CO1** |
| **or** | | | | | |
| **12** | **12a** | Describe briefly about man made nano materials | **10Marks** | **L1** | **CO1** |
| **12b** | Explain briefly about the applications of nanotechnology in the field of medicine | **10Marks** | **L1** | **CO1** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **13** | **13a** | Explain the benefits of using metallic and ceramic nanomaterials in industries | **10Marks** | **L2** | **CO2** |
| **13b** | Explain the structure of fullerene | **10Marks** | **L2** | **CO2** |
| **or** | | | | | |
| **14** | **14a** | Describe briefly the working of quantum dots | **10Marks** | **L2** | **CO2** |
| **14b** | Explain some of the properties of graphene | **10Marks** | **L2** | **CO2** |
|  |  |  |  |  |  |
| **15** | **15a** | Describe the working principle of electrodeposition technique used for synthesizing nanomaterials | **10Marks** | **L2** | **CO3** |
| **15b** | Explain the sol gel method of preparing nanomaterials | **10Marks** | **L2** | **CO3** |
| **Or** | | | | | |
| **16** | **16a** | Explain the PVD method of manufacturing nano materials | **10Marks** | **L2** | **CO3** |
| **16b** | Summarize some of the applications of using nanofluids in the field of engineering | **10Marks** | **L2** | **CO3** |
|  |  |  |  |  |  |
| **17** | **17a** | Describe the working principle of TEM in the field of nanotechnology | **10Marks** | **L2** | **CO4** |
| **17b** | Explain the working principle of SEM used in analyzing nanomaterials | **10Marks** | **L2** | **CO4** |
| **or** | | | | | |
| **18** | **18a** | Contrast between atomic force spectroscopy and scanning electron microscopy techniques used for analyzing nanomaterials | **10Marks** | **L2** | **CO4** |
| **18b** | Describe the benefits of using Energy Dispersive Spectroscopy in nanotechnology | **10Marks** | **L2** | **CO4** |