**Code No.6PC5204ME**

**METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY**

**(An Autonomous Institution)**

**M.EII-Semester (Supplementary) Examination, November-2023**

**Subject: ADVANCED MATERIALS TECHNOLOGY**

**Time: 3 hours Max.Marks:60**

**Note: Missing data, if any, maybe suitably assumed.**

**PART-A**

**Answer All the questions. (05X2M=10M)**

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| --- | --- | --- | --- | --- |
| **Q.No** | **Questions** | **Marks** | **CO** | **BTL** |
| **1 a** | Define the four 4 basic steps in material selection process? | **2** | **CO1** | **BL1** |
| **b** | What are the different mechanisms of strengthening? | **2** | **CO2** | **BL2** |
| **c** | Explain failure and its causes. | **2** | **CO3** | **BL1** |
| **d** | What are shape memory alloys? | **2** | **CO4** | **BL1** |
| **e** | Define the term polymerization with example? | **2** | **CO5** | **BL1** |

**PART-B**

**Answer Any Five questions. (05X10M=50M)**

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| --- | --- | --- | --- | --- | --- |
| **Q.No.** |  | **Questions** | **Marks** | **CO** | **BTL** |
| **2** | **a** | Construct and Explain the Creep Curve. | **10** | **CO1** | **BL3** |
| **b** | Explain the process of material selection procedure. |  | **CO1** | **BL1** |
| **3** | **a** | What are the differences between crystalline and non-crystalline material? | **10** | **CO2** | **BL1** |
| **b** | Explain super plasticity of materials with examples. |  | **CO2** | **BL2** |
| **4** | **a** | Explain Griffith Theory of Brittle Fracture. | **10** | **CO3** | **BL2** |
| **b** | What are the common failure modes and mechanisms in low cycle and high cycle fatigue scenarios? |  | **CO3** | **BL1** |
|  | **a** | What is Quasi-crystal? Explain their structure, properties and applications? | **10** | **CO4** | **BL1** |
| **b** | What do you mean by biomaterials? What are common types of biomaterials? |  | **CO4** | **BL1** |
| **6** | **a** | Differentiate between thermosetting polymer and thermo plastic polymers. Explain characteristics of Thermosetting Materials. | **10** | **CO5** | **BL2** |
| **b** | Explain advanced engineering ceramics. What are the applications of advanced structural ceramic material? |  | **CO5** | **BL3** |
| **7** | **a** | How do you select materials for Aerospace Systems? Explain. | **10** | **CO1** | **BL3** |
|  | Explain Poly phase mixtures and any one process of their preparation. |  | **CO2** | **BL3** |
| **8** | **a** | What is the ductile to brittle transition fracture? | **10** | **CO3** | **BL1** |
| **b** | What is meant by smart materials? Mention examples and its properties. |  | **CO4** | **BL1** |
| **9** | **a** | How is dual phase steel formed? What are the two phases of dual phase steel? | **10** | **CO4** | **BL1** |
| **b** | How does plastic behavior change with strain rate and temperature? |  | **CO2** | **BL1** |

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