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Total No. of Questions : 08

M.Tech. (Mechanical Engineering) (Sem.–3)

SUSTAINABLE DESIGN AND MANUFACTURING

Subject Code : MTME-219
M.Code : 74995

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

1) i) What do you understand by Sustainable Development? What does it mean and how is it to be achieved?

   ii) What are the main components of Sustainable Development? Discuss the linkages between technology and sustainability.

2) i) Discuss the elements of the Sustainability Matrix and explain various issues addressed in the Sustainability Matrix.

   ii) Why do we need Sustainable Business models? How can you start and maintain a Sustainable Business model?

3) i) Describe environmental Quality Function Deployment for Sustainable Products giving an appropriate example.

   ii) What is the circular economy? Explain the technological elements of the circular economy and the principles of 6R based closed-loop material flow in sustainable manufacturing.

4) Explain the principle concept of a Life Cycle Sustainability Assessment (LCSA). Identify and describe three specific assessment methods that should be included as part of an LCSA study.

5) What is Design for disassembly? Discuss the guidelines for ensuring a successful implementation of DFD techniques. Discuss the opportunities and challenges in adopting Design for disassembly.

6) Explain the importance of Environmental Impact Assessment (EIA). Explain the applications of important EIA methodologies for assessing the impacts of any developmental activity on the environment.

7) What is an eco-friendly design? Explain the Eco-design approach for developing Eco-friendly products. What are examples of Sustainable Design?

8) i) How can we measure Sustainable Development? Describe the key indicators of Sustainable Development and their applications.

   ii) Write a short note on Product Sustainability and Risk/Benefit assessment.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.