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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

April 2025 Semester End Make-Up Examinations

Programme: B.E.

Semester: I

Branch: Common to all Branches

Duration: 3 hrs.

Course Code: 22ME1ETISE

Max Marks: 100

Course: Introduction to Sustainable Engineering

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

| | | | UNIT - I | | | CO | PO | Marks |
|---|------------------|----|--|--|--|------------|------------|--------------|
| Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice. | 1 | a) | List and briefly explain the 17 Sustainable Goals as per the 70th UN general assembly held on 25th September 2015 under the official agenda “transforming our word: 2030 towards sustainable development”. | | | CO1 | PO1 PO7 | 10 |
| | | b) | What are the key attributes of the graduate engineers towards sustainable development? | | | CO1 | PO1 PO7 | 10 |
| | OR | | | | | | | |
| | 2 | a) | Explain the concept of system and life cycle thinking towards sustainable development. | | | CO1 CO2 | PO1 PO7 | 10 |
| | | b) | Explain the concept of circular economy with a neat diagram. | | | CO1 CO2 | PO1 PO7 | 10 |
| | UNIT - II | | | | | | | |
| | 3 | a) | What are the ten sustainable engineering principles that guide engineering practice. | | | CO1 CO2 | PO1 PO7 | 10 |
| | | b) | Explain green and low carbon economy. | | | CO1 CO2 | PO1 PO7 | 10 |
| | OR | | | | | | | |
| | 4 | a) | Explain the basic elements of an Environmental Management System (EMS) with PDCA cycle. | | | CO1 CO2 | PO1 PO7 | 10 |
| | | b) | Enumerate the EIA process with its key elements and process flowchart | | | CO1 CO2 | PO1 PO7 | 10 |

| UNIT - III | | | | | |
|-------------------|----|---|-----|------------|-----------|
| 5 | a) | What are the methodologies used to determine the outcomes of LCA? | CO2 | PO1 PO7 | 10 |
| | b) | Explain the Life cycle costing and social life cycle assessment. | CO2 | PO1 PO7 | 10 |
| OR | | | | | |
| 6 | a) | What are the components of LCA, Explain the same? | CO2 | PO1 PO7 | 08 |
| | b) | What are the strength and limitations of LCA. | CO2 | PO1 PO7 | 08 |
| | c) | List any four LCA and LCA software's are used for assessment? | CO2 | PO1 PO7 | 04 |
| UNIT - IV | | | | | |
| 7 | a) | What is carbon foot printing and list out the direct and indirect greenhouse gas emissions (GHG)? And what steps are taken to reduce GHG gases. | CO3 | PO7 PO9 | 10 |
| | b) | Explain the following: i) Environmental product declaration. ii) Energy system. | CO3 | PO7 PO9 | 10 |
| OR | | | | | |
| 8 | a) | Explain environmental economics with suitable examples? | CO3 | PO7 PO9 | 10 |
| | b) | Explain the market-based incentives or economic instruments for sustainability. | CO3 | PO7 PO9 | 10 |
| UNIT - V | | | | | |
| 9 | a) | Explain the general conventional design process with neat flow chart. | CO4 | PO7 PO9 | 10 |
| | b) | What are the two types of engineering problem solving methods? | CO4 | PO7 PO9 | 10 |
| OR | | | | | |
| 10 | a) | What is conventional engineering design process and what are the 4 Cs of design. | CO4 | PO7 PO9 | 10 |
| | b) | Explain the different methods used to measure sustainability. | CO4 | PO7 PO9 | 10 |
