# ETC143

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RAMAIAH Institute of Technology

(Autonomous Institute, Affiliated to VTU)
(Approved by AICTE, New Delhi & Govt. of Karnataka)
Accredited by NBA & NAAC with 'A+' Grade



## SEMESTER END EXAMINATIONS – MAY 2023

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| **Program** | : | **B.E. – Common to ECE / EEE / EIE /ETE / MLE / ME / IEM / CH** | **Semester** | : | **I** |
| **Course Name** | : | **Introduction to Sustainable Engineering** | **Max. Marks** | : | **100** |
| **Course Code** | : | **ETC143** | **Duration** | : | **3 Hrs** |

**Instructions to the Candidates:**

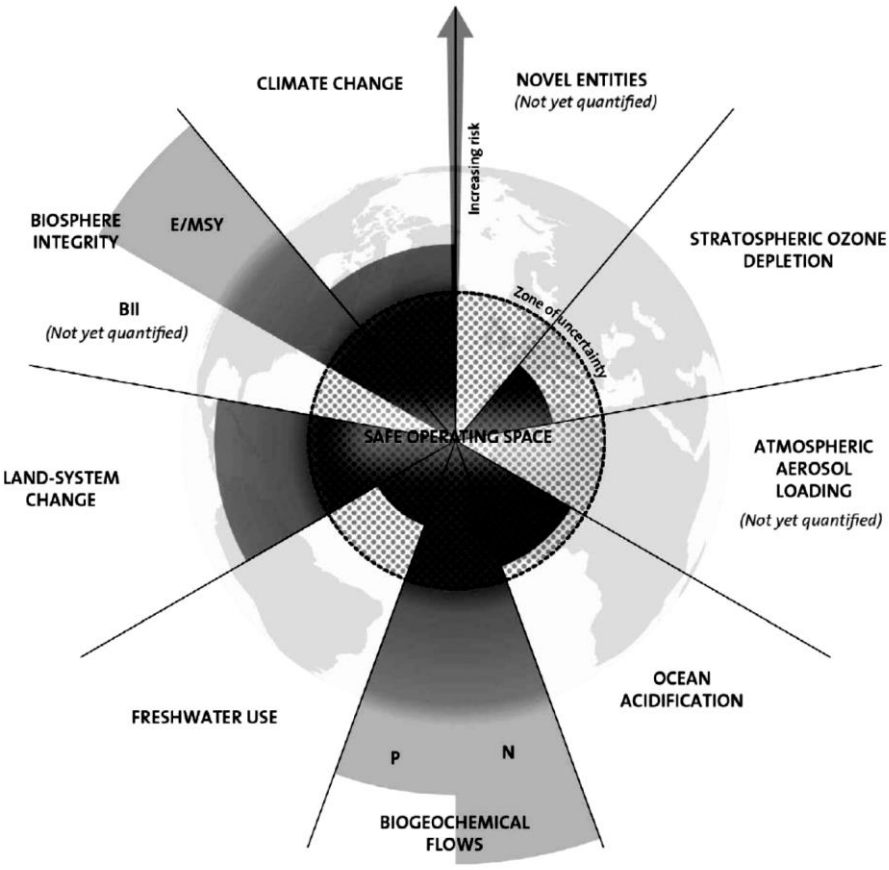
- Answer one full question from each unit.
- Assume missing data suitably.

### UNIT - I

1. a) Define Sustainable Development and explain the role of engineering in sustainable development. CO1 (10)

   b) Explain circular economy with neat diagram. CO1 (10)

2. a) Explain the below diagram with examples: CO1 (15)




   b) Describe Sustainable Development Goals (SDGs). CO1 (05)

### UNIT - II

3. a) Explain the set of 10 principles that guide engineering practice for sustainable engineering. CO2 (10)

   b) Write short notes on: CO2 (10)
   (i) Green Economy (ii) Triple bottom Line.

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| 4. | a) | Explain Environmental Management Systems. List the basic elements of an EMS. | CO2 | (10) |
| | b) | Discuss the Sandestin Sustainable Engineering principles. | CO2 | (10) |

**UNIT - III**

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| 5. | a) | What is Life cycle assessment? Explain the characteristics of LCA tool. | CO3 | (10) |
| | b) | What are the strengths and limitations of LCA? Discuss. | CO3 | (10) |
| 6. | | Briefly explain the steps involved in Life cycle assessments methodology. | CO3 | (20) |

**UNIT- IV**

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| 7. | a) | What is social life cycle assessment? Explain. | CO4 | (10) |
| | b) | Explain drinking water supply and waste water treatment methods used in LCA. | CO4 | (10) |
| 8. | a) | Describe Carbon foot printing with framework for direct and indirect emissions. | CO4 | (10) |
| | b) | Illustrate the linkage between environment and economic activities. | CO4 | (10) |

**UNIT - V**

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| 9. | a) | Distinguish between two types of engineering problems. How are these complex problem solved? | CO5 | (10) |
| | b) | Explain the generic conventional design process tasks. | CO5 | (10) |
| 10. | a) | Describe strategy wheel for design of sustainability. | CO5 | (10) |
| | b) | With a case study explain sustainable process design. | CO5 | (10) |

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