

U.S.N.

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

Autonomous Institute Affiliated to VTU

**February / March 2024 Semester End Main Examinations****Programme: B.E.****Branch: Common to all Branches****Course Code: 22ME1ETISE / 22ME2ETISE****Course: Introduction to Sustainable Engineering****Semester: I / II****Duration: 3 hrs.****Max Marks: 100**

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

<b>Important Note:</b> Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.			<b>UNIT - I</b>	<b>CO</b>	<b>PO</b>	<b>Marks</b>
	1	a)	Discuss the nine planetary scientific framework models that considers the global environmental limits for human development.	CO1	PO7 PO9	<b>10</b>
		b)	What do you understand by the term sustainable development? Discuss the major outcomes of Paris agreement – 2015 (COP21).	CO1	PO7 PO9	<b>05</b>
		c)	How do you analyze the circular economy concept for the achievement of sustainable development goals (SDG) and explain with the help of diagram?	CO2	PO7 PO9	<b>05</b>
			<b>OR</b>			
	2	a)	How the different fields of engineering contribute to meet the targets of Sustainable Development Goals? Discuss briefly any 12 Sustainable Development Goals.	CO1 CO2	PO7 PO9	<b>12</b>
		b)	Interpret Factor-4 and Factor-10 key concepts towards sustainable development.	CO2	PO7 PO9	<b>08</b>
			<b>UNIT - II</b>			
	3	a)	What do you think of Environmental Impact Assessment, a site-specific tool used to measure the sustainability? Discuss its key elements involved with the help of a flow diagram.	CO3	PO7 PO9 PO10	<b>10</b>
		b)	How do engineers contribute to Sustainable Consumption Production (SCP) framework, explain in detail with a neat sketch.	CO3	PO7 PO9 PO10	<b>10</b>
			<b>UNIT - III</b>			
	4	a)	Why do you think “Goal and Scope definition” of Life Cycle Assessment is important for sustainable development? Explain with examples.	CO3	PO7 PO9 PO10	<b>10</b>

	b)	Compare and interpret the LCIA (Life Cycle Impact Assessment) of Incandescent and Compact Fluorescent lamps.	CO3	PO7 PO9 PO10	<b>06</b>
	c)	List the four stages of Life Cycle Assessment.	CO3	PO7 PO9 PO10	<b>04</b>
		<b>UNIT - IV</b>			
5	a)	What is environmental economics? How do you estimate the total economic value of the ecosystem and explicate the different methodologies?	CO1 CO2	PO7 PO9	<b>10</b>
	b)	What do you understand by the term carbon footprint? Explain?	CO1 CO2	PO7 PO9	<b>05</b>
	c)	List the five market based incentives or economic instruments for sustainability in order to internalize the external costs?	CO1 CO2	PO7 PO9	<b>05</b>
		<b>UNIT - V</b>			
6	a)	What are the key tasks in the sustainable engineering design process that differentiates it from the conventional one?	CO4	PO7 PO9 PO10	<b>10</b>
	b)	Discuss the Design for Sustainability (D4S) strategic wheel with the help of diagram?	CO4	PO7 PO9 PO10	<b>10</b>
		<b>OR</b>			
7	a)	How do you integrate the sustainable process design in the production of polyvinylchloride plastic? Explain.	CO4	PO7 PO9 PO10	<b>10</b>
	b)	Explain the role of engineers across the stages of project delivery.	CO4	PO7 PO9 PO10	<b>10</b>

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