Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UPES

End Semester Examination, May 2025

Course: Sustainability Engineering — **Semester:** IV

Program: B.Tech. (Fire and Safety Engineering) — **Time:** 03 hrs.

Course Code: SUEN2009P — **Max. Marks:** 100

Instructions: *1. Read all questions carefully before attempting.*
2. Write legibly and neatly. Illegible answers may result in less marks.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	What are the key principles of sustainable engineering?	**4**	**CO2**
Q 2	What are the key environmental impacts considered in LCA?	**4**	**CO2**
Q 3	What are the most promising renewable energy sources for large-scale power generation?	**4**	**CO2**
Q 4	What are the most effective strategies for reducing water consumption in urban areas?	**4**	**CO2**
Q 5	What are the key characteristics of sustainable materials?	**4**	**CO2**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Write down the benefits of using a system thinking approach in sustainable engineering.	**10**	**CO2**
Q 7	Show the scope of an LCA study in detail with the use of graphics.	**10**	**CO2**
Q 8	Relate the economic benefits of investing in green buildings for developers and occupants.	**10**	**CO3**
Q 9	Identify how can waste-to-energy technologies be integrated into waste management systems. **OR** Identify how do environmental regulations influence the design and development of new products.	**10**	**CO4**
	SECTION-C **(2Qx20M=40 Marks)**		
Q 10	Design a comprehensive strategy that integrates engineering principles to achieve all 17 Sustainable Development Goals (SDGs), detailing innovative solutions and their potential impacts.	**20**	**CO4**
Q 11	Analyze the key principles of green building design, and how do they contribute to sustainability? Also, explain green building certification. **OR** Analyze how can energy storage solutions, such as batteries, support the integration of renewable energy sources? Also, explain the challenges associated with deploying smart grid technologies in rural areas.	**20**	**CO4**