Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 19 – 12- 2025 **Time:** 09:30am – 12:30pm

School: SOCSE/ SOE	**Program:** B. Tech. (CSE/ CIV/ ECE/ EEE/ MEC/ PET/ VLSI)	
Course Code: CIV1200	**Course Name:** Foundations of Integrated Engineering	
Semester: I	**Max Marks**:100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**14**	**8**	**42**	**24**	**12**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. 10Q x 2M=20M

1.	List the purpose of Engineering Code of Ethics	**2 Marks**	**L1**	**CO1**
2.	Define Planned Value and Earned value in the context of Earned Value Management	**2 Marks**	**L1**	**CO1**
3.	Define: i) Energy sustainability and ii) Material sustainability	**2 Marks**	**L1**	**CO2**
4.	List any two objectives of Environmental Sustainability	**2 Marks**	**L1**	**CO2**
5.	Write any two Key Features of System Thinking	**2 Marks**	**L1**	**CO2**
6.	Mention any two Role of Engineers in driving Sustainable Development	**2 Marks**	**L1**	**CO2**
7.	Define: a) Life cycle assessment b) Carbon footprint	**2 Marks**	**L1**	**CO3**
8.	Define automation and list any two disadvantages of automation	**2 Marks**	**L1**	**CO4**
9.	Define smart technologies and list any two key smart technologies	**2 Marks**	**L1**	**CO4**
10.	List any two advantages of using AutoCAD as a drafting tool	**2 Marks**	**L1**	**CO5**

Part B

Answer the Questions. **Total Marks 80M**

11.	A company is installing a new automation control system in a manufacturing plant. The total project budget is ₹6,00,000, and the planned duration is 12 weeks. After 6 weeks, it is observed that only 45% of the work is completed and the actual expenses till week 6 is ₹2,80,000. Compute: PV, EV, AC, SV, CV, SPI, CPI and comment	**10 Marks**	**L2**	**CO1**
	Or			
12.	Compute the Performance metrics as per Earned Value Management for the following project scenario. A software company is working on a project to develop a mobile app for a client. The total project budget is ₹3,00,000 and scheduled duration is 12 weeks. At the end of week 6, the project manager wants to evaluate progress and observe the following: i) Actual completed work = 40% of total project ii) Real expenses incurred by week 6 = ₹1,80,000.	**10 Marks**	**L2**	**CO1**

13.	Explain in detail the Life Cycle Assessment (LCA) framework and discuss its benefits in engineering.	**10 Marks**	**L2**	**CO3**
	Or			
14.	Explain the following types of Life Cycle Assessment (LCA): a) Cradle to Gate b) Gate to Gate	**10 Marks**	**L2**	**CO3**

15.	Explain in detail below concepts related to energy audit a) Purpose of energy audit b) Types of energy audit	**10 Marks**	**L2**	**CO3**
	Or			
16.	Explain in detail below mentioned key concepts of Energy Sustainability in Engineering a) Decarbonization b) Energy Recovery	**10 Marks**	**L2**	**CO3**

17.	A student uses a laptop for 3 hours a day. The laptop consumes 45 watts per hour. The emission factor for electricity is 0.85 kg CO_2/kWh. Calculate the student's weekly carbon footprint from laptop usage in kg CO_2.	**10 Marks**	**L3**	**CO3**
	Or			
18.	A Computer lab uses five air conditioners, each rated 1.8 kW, for 10 hours a day, 25 days a month. The emission factor for electricity is 0.9 kg CO_2/kWh. Calculate the monthly carbon footprint from these AC units.	**10 Marks**	**L3**	**CO3**

19.	A Reinforced concrete (RCC) beam has a total volume = 5.0 m^3. The design uses steel reinforcement equal to 1.2% of the beam volume. Given: Density of steel = 7850 kg/m^3 Density of concrete = 2400 kg/m^3 Embodied energy of steel = 25 MJ/kg Embodied energy of concrete = 1.2 MJ/kg Calculate the total embodied energy of the RCC beam	**10 Marks**	**L3**	**CO3**
	Or			
20.	A Reinforced concrete (RCC) beam has a total volume = 7.0 m^3. The design uses steel reinforcement equal to 1.1% of the beam volume. Calculate the total embodied energy of the RCC beam, given: Density of steel = 7850 kg/m^3 Density of concrete = 2400 kg/m^3 Embodied energy of steel = 35 MJ/kg Embodied energy of concrete = 0.8 MJ/kg	**10 Marks**	**L3**	**CO3**

21.	Explain the following type of automation a) Programmable Automation b)Flexible Automation Also, describe the merits and demerits of each.	**10 Marks**	**L2**	**CO4**
	Or			
22.	Using a production variety–production quantity graph, differentiate among the three types of automation. Also list any two benefits and two limitations of each type of automation.	**10 Marks**	**L2**	**CO4**

23.	Illustrate the core building blocks of smart technologies with a neat diagram and list any four application areas where smart technologies are commonly used.	**10 Marks**	**L2**	**CO4**
	Or			
24.	List and explain any five fundamental characteristics of the Internet of Things (IoT).	**10 Marks**	**L2**	**CO4**

25.	Explain the key features of AutoCAD and highlight the applications of AutoCAD in various engineering domains.	**10 Marks**	**L2**	**CO5**
	Or			
26.	Write short notes on Building Information Modelling (BIM) and list all the dimensions of BIM.	**10 Marks**	**L2**	**CO5**