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Bengaluru

Mid Term Examinations - October 2026

Date: 06/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: PET1010 **Course Name:** Carbon Capture and Utilization for Sustainability

Semester: Seventh Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2
Marks	46	44

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	Identify two industrial point sources of CO_2 suitable for CCUS.	2	CO1	BT1
2	Identify the critical temperature and pressure of CO_2	2	CO1	BT1
3	Name the two negative-emission pathways discussed in CCUS	2	CO1	BT1
4	**Select the right option** **Which capture method separates CO_2 from flue gas:** **A)** A. Pre-combustion **B)** B. Post-combustion **C)** C. Oxyfuel **D)** D. DACCS	2	CO2	BT1
5	Name the three major post-combustion CO_2 capture routes	2	CO2	BT1

PARTB: Answer Any 1 Following Questions. 20 M

Q.N.	Questions	M	CO	BT
06.A	Explain the role of carbon capture and utilization in sustainability, highlighting both environmental and economic benefits	10	CO1	BT2
06.B	Predict the different industrial applications of CO_2 in its supercritical, solid (dry ice), and liquid forms, and explain how these uses contribute to industries like refrigeration, food processing, and separation technologies	10	CO1	BT2
07.A	Explain how BECCS and DACCS technologies contribute to achieving net negative carbon emissions.	10	CO1	BT2

07.B	Using the data provided below, calculate and compare the CO_2 capture potential of the selected industrial sources. Explain the relationship between CO_2 emissions, capture rate, and capturable CO_2. [10 Marks] **Source** / **Global CO_2 Emissions (Mt/year)** / **Capture Rate (%)** Coal-to-power 9,031 85 Cement production 2,000 85 Iron and steel production 1,000 50 Ammonia production 150 85 Fermentation of biomass 18 100 a) Estimate the capturable CO_2 for each source using the given formula. b) Estimate your calculated CO_2 values. c) Differentiate between the source having the highest capture rate and the source having the largest capturable quantity.	10	CO1	BT2

PARTC: Answer Any 1 Following Questions. 20 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
08.A	Explain the oxy-fuel combustion method of carbon capture and contrast its benefits and limitations with either pre-combustion or post-combustion capture.	10	CO2	BT2
08.B	Interpret how India’s current CCUS initiatives align with global climate action goals and the nation’s industrial decarbonization roadmap.	10	CO2	BT3
09.A	Explain the technologies used in post-combustion CO_2 capture with flow charts and their contribution to achieving low-carbon energy goals.	10	CO2	BT2
09.B	Demonstrate the pre-combustion carbon capture process using suitable flow diagrams, including its efficiency, advantages, and limitations.	10	CO2	BT3