

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- VI EXAMINATION – SUMMER 2026

Subject Code:3161312

Date:26-05-2026

Subject Name:Global Warming and Climate Change

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Define the terms: 1. Trade winds 2. Westerlies 3. ITCS **03**
(b) Differentiate between Natural and Enhanced Green House Effect. **04**
(c) Justify the statement: “The Sun : A Weather Engine”. **07**
- Q.2** (a) Define the term Weather and Climate. **03**
(b) Describe the sources of Methane in details. **04**
(c) Explain the mechanisms of sunlight interacts with GHGs. **07**
- OR**
- (c) Compare CO₂ and CH₄ as Green House Gases. **07**
- Q.3** (a) Explain the concept Global Warming. **03**
(b) Enlist and describe any TWO climate element. **04**
(c) Describe the Global Winds Circulation with diagram. **07**
- OR**
- Q.3** (a) Explain the Climate Impacts with example. **03**
(b) Differentiate between Global Warming and Climate Change. **04**
(c) Discuss the Global Carbon cycle in detail **07**
- Q.4** (a) Describe Temperature and Salinity Variability of the Ocean. **03**
(b) Explain the El-Nino Southern Oscillation (ENSO) in detail. **04**
(c) Discuss the role of Oceans in Climate Change. **07**
- OR**
- Q.4** (a) Explain Global Circulation Model. **03**
(b) Differentiate between Climate model and Weather model. **04**
(c) Discuss the applications of Climate Modelling. **07**
- Q.5** (a) Explain the role of IPCC and UNFCCC. **03**
(b) Describe the Kyoto Protocol. **04**
(c) Discuss the concept of Carbon Capture and Sequestration (CCS). **07**
- OR**
- Q.5** (a) Explain the applications of Carbon Capture and Sequestration (CCS). **03**
(b) Discuss Enhanced Oil Recovery system. **04**
(c) Explain any one technologies used to capture CO₂ from the industrial source. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI EXAMINATION – SUMMER 2025

Subject Code: 3161312

Date: 26-05-2025

Subject Name: Global Warming and Climate Change

Time: 10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Define the term Green House Gas (GHG). Discuss the role of GHGs in Global warming and Climate change. **03**
- (b) 'Carbon Dioxide and Water Vapor are the most significant GHGs.' – Justify the statement. **04**
- (c) Describe the concept of enhanced greenhouse gas effect. **07**
- Q.2** (a) Define the following terms: **03**
1. Global Warming Potential 2. Jet Stream 3. Gulf Stream
- (b) Difference between Weather and Climate. **04**
- (c) Describe the latitudinal atmospheric circulation with figure. **07**
- OR**
- (c) Describe the longitudinal atmospheric circulation with figure. **07**
- Q.3** (a) State the Stephan-boltzman principle. **03**
- (b) Enlist and explain any TWO Carbon Fluxes in detail. **04**
- (c) Describe the Thermohaline Circulation in detail. **07**
- OR**
- Q.3** (a) Enlist the GHG and mention respective Global Warming Potential (GWP). **03**
- (b) Discuss the significance of ITCZ in atmospheric circulation. **04**
- (c) Discuss the role of Oceans with respect to Global Warming. **07**
- Q.4** (a) Define the term Carbon Capture and Utilization (CCU). **03**
- (b) Enlist and explain any ONE CO₂ capture technologies in detail with schematic block diagram. **04**
- (c) Enlist and explain options to mitigate the Climate Change in detail. **07**
- OR**
- Q.4** (a) Define the term Enhance Oil Recovery (EOR). **03**
- (b) Discuss the Oxy-fuel combustion capture systems in detail. **04**
- (c) Differentiate between Carbon Capture and Storage (CCS) and Carbon Capture and Utilization (CCU). **07**
- Q.5** (a) Explain the role of IPCC. **03**
- (b) Describe the Joint Implementation (JI) mechanism in detail. **04**
- (c) Discuss the National legislative frameworks for Climate Change in detail. **07**
- OR**
- Q.5** (a) Explain the significance of Kyoto protocol. **03**
- (b) Explain the concept of Circular Economy. **04**
- (c) Discuss the application of Climate Modelling. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:3161312****Date:20-05-2024****Subject Name:Global Warming and Climate Change****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Explain the term Carbon Dioxide Equivalent Emission with example. **03**
 (b) Explain the sources of Methane emission. **04**
 (c) Describe the Natural and Enhanced Green House Effect in detail. **07**

- Q.2** (a) Define the following terms: **03**
 Climate Change, Climate Adaptation and Climate Resilience.
 (b) Differentiate between Global Warming and Climate Change. **04**
 (c) Enlist and explain sources and impacts of any THREE Green House Gases. **07**

OR

- (c) Explain the Global Carbon Cycle in detail. **07**
- Q.3** (a) Enlist the ways to stabilize Atmospheric Carbon Dioxide Concentration. **03**
 (b) Explain the concept of Carbon Capture and Storage (CCS). **04**
 (c) Explain the types of CO₂ Capture technologies in detail with schematic block diagram. **07**

OR

- Q.3** (a) Explain the concept of Enhanced Oil Recovery (EOR). **03**
 (b) Explain the concept of Carbon Capture and Utilization (CCU). **04**
 (c) Enlist and explain options to mitigate the Climate Change in detail. **07**

- Q.4** (a) Define the term Environmental Economics. **03**
 (b) Discuss the role of IPCC. **04**
 (c) Describe the Global Wind Circulation in detail. **07**

OR

- Q.4** (a) Discuss the role of UNFCCC. **03**
 (b) Describe the Joint Implementation (JI) mechanism. **04**
 (c) Describe the role of Ocean in Climate Change. **07**

- Q.5** (a) Explain the Global Circulation Model. **03**
 (b) Describe the elements of Weather and Climate Modelling. **04**
 (c) Discuss the applications of Climate Modelling. **07**

OR

- Q.5** (a) Explain the term Representative Concentration Pathway (RCP) Scenario. **03**

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|------------|---|-----------|
| (b) | Discuss the Global Climate Impacts on the Human Health. | 04 |
| (c) | Describe the elements of Weather and Climate Modelling. | 07 |

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3161312****Date:10-07-2023****Subject Name:Global Warming and Climate Change****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Give the statistical contribution of greenhouse gases in the atmosphere.	03
	(b) Differentiate between Weather and Climate. Explain any one element of weather.	04
	(c) Explain the significance of Global warming and Climate change in Environmental Engineering field.	07
Q.2	(a) Explain natural and enhanced green house effect?	03
	(b) What are the 5 greenhouse gases that contributes to climate change? How greenhouse gases affect the climate?	04
	(c) What are Climate Change and Climate Variability? Explain with examples.	07
	OR	
	(c) How does Methane can contribute in climate change? What are the sources and impacts?	07
Q.3	(a) State the objectives of IPCC.	03
	(b) How does CFCs can contribute in climate change? What are the sources and impacts?	04
	(c) What is meant by carbon capture and sequestration? What processes are involved in carbon capture and sequestration CCS? Explain one process of Carbon Capture adopted by Cement manufacture.	07
	OR	
Q.3	(a) What are the benefits of climate change models?	03
	(b) What is EOR and how does it work? Why is EOR important?	04
	(c) Define and discuss the pathways for Carbon Dioxide Removal (CDR) and Negative Emissions.	07
Q.4	(a) What are the geological storage options for CO ₂ ?	03
	(b) What are the advantages of storing carbon dioxide in geological reservoirs?	04
	(c) Discuss Global Latitudinal Wind Pattern in detail.	07
	OR	
Q.4	(a) What is CDM of Kyoto Protocol? How does CDM work?	03
	(b) What is the Kyoto Protocol? On which mechanism it works?	04
	(c) What is the UNFCCC and what does it do? What does IPCC stand for? What does the IPCC say about climate change?	07
Q.5	(a) What is COP and MOP? What is the purpose of the COP Conference?	03
	(b) What is the difference between joint implementation and Clean Development Mechanism?	04
	(c) Explain in detail How does economic system help to solve economic issues and problems in an economy?	07
	OR	
Q.5	(a) How is economics related to environmental policy?	03
	(b) What is environmental economics how it is beneficial in environmental management?	04
	(c) Explain how environmental policies to deal with air and water pollution.	07

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3161312****Date:06/06/2022****Subject Name:Global Warming and Climate Change****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- | | | |
|------------|---|-----------|
| Q.1 | (a) Differentiate between Weather and Climate. | 03 |
| | (b) Enlist and explain any one element of weather. | 04 |
| | (c) Discuss the sources of methane and its climatic effects in detail. | 07 |
| Q.2 | (a) Define the following terms: | 03 |
| | 1. Short-lived climate forcers (SLCF) | |
| | 2. Emission trading | |
| | 3. Climate Projection | |
| | (b) Discuss the role of IPCC and UNFCCC. | 04 |
| | (c) Explain earth's energy budget in detail. | 07 |
| | OR | |
| | (c) Discuss the pathways to achieve the Kyoto target. | 07 |
| Q.3 | (a) How anthropogenic activities exert cooling influence on earth's climate ? | 03 |
| | (b) Classify the climate models. | 04 |
| | (c) Discuss Global Longitudinal Wind Pattern in detail. | 07 |
| | OR | |
| Q.3 | (a) Define the following terms : | 03 |
| | 1. Radiative Forcing | |
| | 2. ITCZ | |
| | 3. Carbon Capture and Sequestration (CCS) | |
| | (b) Differentiate between weather model and climate model. | 04 |
| | (c) Discuss Global Latitudinal Wind Pattern in detail. | 07 |
| Q.4 | (a) Define the following terms : | 03 |
| | 1. Climate Sensitivity | |
| | 2. Climate feedback | |
| | 3. Representative Concentration Pathway (RCP) Scenario | |
| | (b) Discuss global ocean conveyor belt in detail. | 04 |
| | (c) Discuss the Global Carbon Cycle in detail. | 07 |
| | OR | |
| Q.4 | (a) Discuss effect of climate change on Precipitation. | 03 |
| | (b) Discuss the indications of global warming. | 04 |
| | (c) Discuss the GHG emission mitigation action. | 07 |

- Q.5** (a) How do greenhouse gases such as carbon dioxide cause global warming? **03**
- (b) Discuss effect of climate change on agriculture and food production. **04**
- (c) Discuss the Impacts of 1.5°C and 2°C of Warming. **07**

OR

- Q.5** (a) Define the following terms : **03**
1. Thermohaline circulation
 2. Gulf stream
 3. Ocean current
- (b) Enlist and explain any one components of a climate model. **04**
- (c) Define and discuss the pathways for Carbon Dioxide Removal (CDR) and Negative Emissions. **07**
