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The Assam Royal Global University, Guwahati
Royal School of Environmental and Earth Sciences
M.Sc. Environmental Science, 3rd Semester
Semester End Examination, January 2023
Course Title: Climate Change and its Impact
Course Code: ENV164D301

Time: 3 Hours

Maximum Marks: 70

Note: Attempt all questions as per instructions given.
The figures in the right-hand margin indicate marks.

Section – A

1. Attempt all questions. (Maximum word limit 50) 2 x 8
- a. Compare the global warming potential of two major agricultural greenhouse gases.
 - b. What was the (i) pre-industrial concentration of CO₂ and (ii) the current concentration of CO₂? What is the major cause of increase in CO₂ in the atmosphere?
 - c. What is the major difference in gas chromatography for analysis of CH₄ and N₂O?
 - d. Why soil temperature is an important factor associated with GHG production?
 - e. What do you mean by carbon sequestration?
 - f. What is CCS technology? How it is related to climate change?
 - g. Is ozone depletion has something to do with climate change? Justify your answer.
 - h. What is COP? What are its main objectives? When and where was the first COP meeting held?

Section – B

2. Attempt any two of the following: 6 x 2
- a. Describe in detail the static box technique used in the field for measurement of GHG.
 - b. What soil and atmospheric parameters are recorded before the start of the sampling of methane in the field?
 - c. Explain the impact of high temperature on floral biology leading to yield loss in agricultural crops.
3. Attempt any two of the following: 7 x 2
- a. Describe the mechanism of transport of N₂O through a rice plant. Why some varieties of rice emit more N₂O and some emit less with example of varieties?
 - b. Explain in detail the nitrification and denitrification reaction in soil, how are they related to urea application in the field?
 - c. Describe how agricultural management can be used to regulate the emission of GHGs with reference to fertilizer and tillage management.
4. Attempt any two of the following: 7 x 2
- a. Describe the role of agroforestry in mitigation and adaptation of climate change with suitable examples.
 - b. Describe the mechanism of terrestrial carbon sequestration. How photosynthesis is related to this?
 - c. Critically examine the geo-engineering technologies to mitigate global climate change?
5. Attempt any one of the following: 14 x 1
- a. Describe the stratospheric ozone layer depletion and its effect on living organisms.
 - b. How the Paris Agreement is linked with the Sustainable Development Goals?