Enrolment No. _____

AHMEDABAD UNIVERSITY

AMRUT MODY SCHOOL OF MANAGEMENT

UNDERGRADUATE PROGRAMMES

2023-2024 MONSOON SEMESTER

MID SEMESTER EXAMINATION

ENV210 ENERGY AND CLIMATE CHANGE

Date: 18-09-2023 Total Marks: 50

Time: 05.00 pm – 08.00 pm No. of printed pages: 02

General Instructions: This is an LMS based online exam.

RELEVANT FILES FOR THE MIDSEM HAVE BEEN UPLOADED SEPERATELY. IF YOU NEED ACCESS TO ADDITIONAL FILES, THEY CAN BE ACCESSED FROM THE COURSE MATERIALS.

1. For the country, Indonesia**, using real GDP (2015 constant US dollars), population and CO2 Emissions, Total Primary Energy Supply and Energy Balances for the years 1990 - 2019

   Find the following for all years and relate them to climate variables such as temperature and precipitation changes along with the Köppen-Geiger Climate Classification, 1991-2020, for the different climate zones of your respective country. Explain possible reasons for climatic changes in relation to energy and emission variables. (5 x 6 = 30 marks):

   a. CO2 Emissions across all sectors.

   b. Energy Intensity Ratio (calculated as Final Energy Consumption/GDP)

   c. Emission Intensity Ratio (calculated as CO2 Emissions/GDP)

   d. Carbonization Factor (calculated as CO2 Emissions/ Total Primary Energy Supply)

   e. Per Capita Emissions (calculated as CO2 Emissions/ Population)

   f. Per Capita GDP (calculated as GDP/Population)

   Plot all graphs. Remember to mention the units. Apart from other regular units, please remember that CO2 emissions expressed in Mt CO2/yr implies Million Tonnes of CO2 per year.

   Relevant Links:

   https://unstats.un.org/unsd/energystats/dataPortal/

   https://earthobservatory.nasa.gov/features/GlobalWarming

   https://data.worldbank.org/

   https://climateknowledgeportal.worldbank.org/

** *there was a random selection across 10 versions of the question paper where only the countries were selected randomly from any one of Turkey, Portugal, New Zealand, Myanmar, Malaysia, Japan, Indonesia, Guatemala, Greece, Chile*

2. (a) In the paper by Tiewsoh et al. 2019, outline how generation and electricity demand have a mismatch for the case of India. Mention the rates at which supply, demand and sectoral demand is growing. (10 marks)

   (b) Following the definition from Energy Statistics, from MoSPI/GoI, explain how electricity supply can possibly be increased by reducing electricity's transmission and distribution losses. Can non-utilities play a role here? You can answer using data and concepts from Chapters 5, 6 and Annexure-I. (5 marks)

3. From the paper by Mittal et al. 2018, outline the relevant scenarios for India meeting its Nationally Determined Contribution (NDC) targets and global climate stabilization goals. Provide innovative solutions on how economic and energy losses can be minimized for India. You can also refer to the Appendix. (5 marks)