

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)

CLASS: PRE-PHD  
BRANCH: ENV. SC. & ENGG.

SEMESTER : NA  
SESSION : MO/18

SUBJECT: CE563 CLIMATE CHANGE ADAPTATION

TIME: 3 HRS.

FULL MARKS: 50

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) Explain effect of wind circulation system on climate? [5]  
Q.1(b) Suppose glacial melting causes the earth's albedo to change from 0.31 to 0.30. estimate the resulting radiative forcing. If the climate sensitivity factor is somewhere between 0.34 and 1.03 °C per W/m<sup>2</sup>, estimate the change in surface temperature. [5]

- Q.2(a) Examine the role of aerosols in climate change? [5]  
Q.2(b) Using the following radiative forcing data, derive appropriate forcing functions for each of the gases. Assume they have been in the linear, square root, or logarithmic regions from preindustrial times to the current time. [5]

Gas	Concentration in 1850 (ppb)	Concentration in 1992 (ppb)	$\Delta F$ (W/m <sup>2</sup> )	2100 (ppb)
CO <sub>2</sub>	278,000	356,000	1.56	710,000
CH <sub>4</sub>	700	1,714	0.47	3,616

Suppose an emission scenario estimates the following concentrations for CO<sub>2</sub> and CH<sub>4</sub> in the year 2100. Using a climate sensitivity factor  $\lambda$  equal to 0.57 °C per W/m<sup>2</sup>, estimate the equilibrium global temperature change caused by the forcing of these two gases.

- Q.3(a) Assess the impact of climate change on key sectors and system with special reference to any one component. [5]  
Q.3(b) Explain how climatic models can be used in climatic projections and explore the uncertainties associated with climatic models? [5]
- Q.4(a) Assess the impact of climate change on developing countries on the basis of adaptive capacity of a system. [5]  
Q.4(b) Determine the method by which parameter of a system is chosen to evaluate the vulnerability of people against impact of climate change? [5]
- Q.5(a) In today's scenario developed countries sees all commodities as trade. Investigate environmental businesses which could mutually benefit both developing and developed countries? [5]  
Q.5(b) Describe the role of UNFCCC in climate change? Depict on the basis of assessment reports published by UNFCCC. [5]