

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

CLASS: M.Sc.
BRANCH: Environmental Science and Management

SEMESTER : 3RD
SESSION : MO/2025

SUBJECT: ES516 CLIMATE CHANGE AND ADAPTATION

TIME: 3 Hours

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)	Classify the types of clouds and critically discuss its role in climatic feedback.	[5] 1	2
Q.1(b)	Draw the diagram of earth's energy balance and explain.	[5] 1	3
Q.2(a)	Explain the general circulation of global wind pattern.	[5] 2	2
Q.2(b)	Correlate climate change with droughts and floods?	[5] 2	2
Q.3(a)	Discuss the concept of radiative forcing and feedback mechanism related to climate change.	[5] 3	3
Q.3(b)	Suppose global fossil fuel combustion emits 9.8 GtC/yr and cement production emits another 1.0 GtC/yr. Assuming the airborne fraction of 0.38 and landuse emissions 3.2 GtC/yr, what rate of change of CO ₂ concentration do you expect?	[5] 3	4
Q.4(a)	Discuss the climate sensitivity parameters and write the mathematical expressions of them.	[5] 4	2
Q.4(b)	Discuss the effects of global warming on the oceans.	[5] 4	3
Q.5(a)	Differentiate between adaptation, resilience and vulnerability of climate change.	[5] 5	4
Q.5(b)	According to Kyoto Protocol which mechanisms are suggested for carbon trading? Explain them.	[5] 5	2

:21/11/2025: