6.3 Climate change: mitigation and adaptation

Name: _____ Class: _____ Date: _____ **Total: 19 marks**

KEY WORDS mitigation • adaptation • carbon tax • cap and trade • carbon capture and storage • climate justice

Objective

Build the skills to answer exam questions on responses to climate change: **mitigation**, **adaptation**, policy tools such as a **carbon tax**, and international agreements.

You must be able to:

- distinguish between mitigation and adaptation, with examples
- explain how carbon pricing and other policies reduce emissions
- evaluate adaptation strategies for a named place
- discuss the strengths and limits of international climate agreements

1 Key knowledge and worked examples

■ Responding to climate change

	mitigation	**adaptation**
aim	reduce the **cause**: cut emissions or remove greenhouse gases	reduce the **harm** of changes that happen anyway
examples	renewable energy, energy efficiency, electric transport, reforestation, carbon capture and storage (CCS), less meat	sea walls, drought-resistant crops, flood warnings, houses on stilts, water storage, moving away from coasts

Policy tools

- **Carbon tax:** a price per tonne of CO_2 emitted. Polluting becomes more expensive, so firms and people switch to cleaner options.
- **Cap and trade:** the government sets a total limit (cap) and sells or gives permits;

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firms that cut emissions can sell spare permits (e.g. the EU Emissions Trading System).

- **Regulation and subsidies:** efficiency standards, bans on new coal plants, grants for solar panels.
- **Geoengineering:** large-scale methods such as reflecting sunlight; untested and risky.

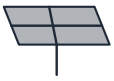
Agreements: the **Paris Agreement** (2015): keep warming **well below** 2 °**C** and try for 1.5 °C. Each country sets its own targets (**nationally determined contributions**) and should raise them every five years. Targets are not legally enforced. Current pledges lead to roughly 2.5–3 °C by 2100.

Climate justice: rich countries emitted most of the CO_2 so far; poor countries often suffer most and have least money to adapt.

Answer shapes: say whether a strategy is mitigation or adaptation, then give one strength and one limitation.

2 Practice

2.1 Distinguish between climate change mitigation and adaptation, giving **one** example of each. [2]



solar panels



sea wall

2.2 Classify each action as mitigation (M) or adaptation (A): sea wall; solar farm; drought-resistant maize; carbon tax; planting forests; flood early-warning system. [3]

sea wall | solar farm | drought maize | carbon tax | planting forests | flood warning

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3 Exam-style questions

3.1 A government introduces a carbon tax of \$50 per tonne of CO_2.

(a) Explain how a carbon tax reduces emissions. [2]

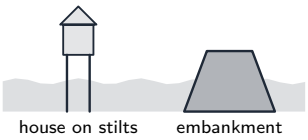


(b) Outline **two** reasons why some people oppose a carbon tax. [2]

3.2 Bangladesh has a large, low-lying delta with many people living near the coast.

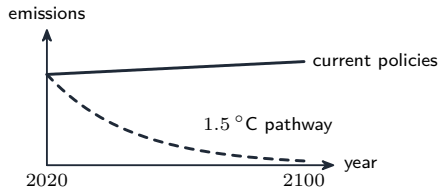
(a) Suggest **two** adaptation strategies for people in the delta. [2]

(b) Explain why adaptation alone is not enough to deal with climate change. [3]



3.3 In 2015 almost every country signed the Paris Agreement.

Discuss the effectiveness of the Paris Agreement. [5]



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Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

mitigation: reducing greenhouse gas emissions or removing them from the air, e.g. solar power, reforestation; adaptation: changing how we live to reduce harm from climate change, e.g. sea walls, drought-resistant crops

2.2

award [1] for every two correct: M: solar farm, carbon tax, planting forests; A: sea wall, drought-resistant maize, flood early-warning system

3.1

(a) burning fossil fuels becomes more expensive; so firms and consumers switch to low-carbon energy, use less energy and invest in efficiency

(b) any two: raises prices of fuel and goods, hitting poorer households hardest; firms may move to countries without the tax (carbon leakage); job losses in coal and heavy industry

3.2

(a) any two: raised houses or homes on stilts; embankments and cyclone shelters; flood and cyclone warning systems; salt-tolerant rice; floating gardens

(b) adaptation does not reduce the cause, so warming and its impacts keep growing; there are limits, e.g. walls cannot hold back very high sea levels and some land will be lost; adaptation is costly and poorer countries cannot afford enough of it, so emissions must also be cut (mitigation)

3.3

award up to [5]: strengths: nearly every country takes part, rich and poor; clear goal of well below 2 °C, aiming for 1.5 °C; targets reviewed and raised every five years; weaknesses: targets are set by each country and not legally enforced; current pledges still lead to about 2.5–3 °C; the USA has left it twice; conclusion: a useful framework that depends on countries raising and meeting their targets