1.7 Weather Hazards: 30-minute Pack

AQA 8035 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 'Even high-income countries cannot fully prevent the impacts of extreme weather.' Assess the extent to which you agree with this statement.

(Total for Question 1 is 9 marks)

2 This question is about the formation and structure of tropical storms.

(a) State THREE conditions needed for a tropical storm to form. **(3)**

(b) Describe the structure of a mature tropical storm, including the eye and the eyewall. **(3)**

(Total for Question 2 is 6 marks)

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3 For each statement below about tropical storms, state whether it is TRUE or FALSE.

(a) Tropical storms lose strength (weaken) once they move over land. **(1)**

(b) Tropical storms form directly on the Equator, at 0 degrees latitude. **(1)**

(c) Storm surges (a rise in sea level pushed onshore by a storm) are a secondary hazard associated with tropical storms. **(1)**

(Total for Question 3 is 3 marks)

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4 This question is about extreme weather in the UK.

(a) Give THREE types of extreme weather that can affect the UK. **(3)**

(b) Explain why the UK can experience such a wide range of extreme weather types, despite its generally mild, temperate climate. **(3)**

(Total for Question 4 is 6 marks)

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5 Explain TWO ways the UK responded to the flooding caused by Storm Desmond.

(Total for Question 5 is 4 marks)

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Mark scheme · 1.7 Weather Hazards: 30-minute Pack

Question 1

Level 4 A detailed, well-balanced assessment that uses accurate, detailed reference to named examples (e.g. Storm Desmond and/or Hurricane Katrina); weighs the extent to which development level reduces impact against factors that remain outside a country's control, and reaches a clear, justified conclusion. **7-9**

Level 3 A clear assessment that uses accurate reference to at least one named example in some detail; a conclusion is reached, though the balance of the argument may be less developed. **5-6**

Level 2 Some relevant comparison is made, with limited or generalised use of named examples; a simple conclusion is given with little justification. **3-4**

Level 1 One or two isolated relevant points about extreme weather are made, with little or no use of named examples or comparison. **1-2**

Level 0 No relevant content. **0**

Indicative content:

- Storm Desmond (UK, 2015, HIC): a UK 24-hour rainfall record was set at Honister Pass; despite the UK's wealth and flood-warning systems, several thousand homes and businesses were still flooded across Cumbria and Lancashire.
- Hurricane Katrina (USA, 2005, HIC): an estimated 1,800 or more deaths and around 80% of New Orleans flooded after levee failures, despite the USA being a high-income country with significant hazard-management resources.
- Supports the statement: both examples show that even well-resourced, high-income countries cannot fully prevent damage and disruption from an unusually extreme or rare weather event; physical factors (exceptional rainfall totals, a city built below sea level) can overwhelm existing defences.
- Challenges the statement: development level still clearly reduces the SCALE of impact; the UK's death toll from Storm Desmond was far lower than Katrina's, and both events caused far fewer deaths than comparable disasters in lower-income countries, showing prevention/mitigation is far more effective in wealthier countries even if not perfect.
- Katrina in particular showed that poor local decisions (delayed evacuation, under-maintained levees) worsened the impact beyond what wealth alone would predict, suggesting governance and planning matter as much as income.
- A well-supported conclusion should distinguish between fully preventing impacts (which the evidence suggests is not realistic for extreme events even in HICs) and substantially reducing them (which development level and preparedness clearly achieve), reaching a balanced judgement on the statement.

Question 2

(a) sea surface temperature of at least 26-27°C, to a depth of around 50 m, oe **B1**

(a) the location must be at least 5 degrees latitude from the Equator, so the Coriolis effect can make the storm spin, oe **B1**

(a) low wind shear (little change in wind speed/direction with height), so the storm structure is not torn apart, oe **B1**

(a) Answer: Sea temperature of at least 26-27°C to a depth of around 50 m; a location at least 5 degrees of latitude from the Equator, so the Coriolis effect makes the storm spin; and low wind shear, so the developing storm is not torn apart.

(b) the eye is a calm, roughly circular area at the centre, with light winds, little cloud and no rain, oe **B1**

(b) the eyewall surrounds the eye and is a ring of very tall cumulonimbus cloud with the storm's strongest winds and heaviest rainfall, oe **B1**

(b) spiral rainbands of cloud and heavy rain extend outward from the eyewall, oe **B1**

(b) Answer: The eye is a calm central area with light winds and little rain; it is surrounded by the eyewall, a ring of tall cumulonimbus cloud with the storm's strongest winds and heaviest rain; spiral rainbands of cloud and rain extend outward from the eyewall.

Question 3

(a) true **B1**

(a) Answer: True.

(b) false **B1**

(b) Answer: False.

(c) true **B1**

(c) Answer: True.

Question 4

(a) any valid type, e.g. heavy rainfall/flooding, oe **B1**

(a) any second valid type, e.g. drought, oe **B1**

(a) any third valid type, e.g. strong winds/storms, extreme cold/snow, or heatwaves, oe **B1**

(a) Answer: For example: heavy rainfall/flooding, drought, and strong winds/storms.

(b) the UK sits at the boundary of several different air masses (e.g. warm tropical maritime air, cold polar maritime/continental air), oe **B1**

(b) which air mass is dominant can change over just a few days, bringing rapidly changing conditions, oe **B1**

(b) the UK is also affected by the jet stream, whose position influences whether low-pressure systems (bringing wind and rain) or high-pressure systems (bringing settled weather) dominate, oe **B1**

(b) Answer: The UK sits at the boundary of several different air masses, and which one dominates can change within days, bringing rapidly changing conditions; the position of the jet stream also influences whether low-pressure systems (wind and rain) or high-pressure systems (settled weather) affect the UK at any given time.

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Question 5

response 1, e.g. the emergency services and Environment Agency issued flood warnings and helped evacuate and rescue residents from flooded homes, oe **B1**

linked detail, e.g. reducing the risk to life during the immediate flooding, oe **B1**

response 2, e.g. the army was deployed to help with flood defences and clean-up, and emergency funding was made available to affected households and businesses, oe **B1**

linked detail, e.g. speeding up recovery and repair after the flood, oe **B1**

Answer: For example: emergency services and the Environment Agency issued flood warnings and helped evacuate and rescue residents, reducing the risk to life; and the army was deployed to help with flood defences and clean-up, while emergency funding was made available to affected households and businesses, speeding up recovery.

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