

a-level exam questions & answers:

hazards (section c) >

mark scheme | 20-mark question #1



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| Q.: | Sp. Ref.: | Information For Markers: | B'down: | Marks: |
|-----|-------------------------|--|------------------|--------|
| 5) | 3.1.5.5 & 3.1.5.6 | <p>With reference to a multi-hazardous environment that you have studied, assess the view that the underlying cause(s) leading to the hazards is human activity rather than physical factors.</p> <p>AO1 – Knowledge and understanding of the cause of storms and wildfires. Knowledge and understanding of the similarities, differences and links between storm and wildfire events in the context of impacts to human activity and nature.</p> <p>AO2 – Application of knowledge and understanding to assess the changing threat of wildfire and storms on people and place with reference to case studies or examples.</p> <p>Notes for answers</p> <p>AO1</p> <ul style="list-style-type: none">• The nature of tropical storms and their underlying causes. Forms of storm hazard: high winds, storm surges, coastal flooding, river flooding and landslides.• Spatial distribution, magnitude, frequency, regularity, predictability of hazard events.• Impacts: primary/secondary, environmental, social, economic, political. Short- and long-term responses: risk management designed to reduce the impacts of the hazard through preparedness, mitigation, prevention and adaptation.• Impacts and human responses as evidenced by two recent tropical storms in contrasting areas of the world.• Nature of wildfires. Conditions favouring intense wild fires: vegetation type, fuel characteristics, climate and recent weather and fire behaviour.• Causes of fires: natural and human agency.• Impacts: primary/secondary, environmental, social, economic, political. Short- and long-term responses; risk management designed to reduce the impacts of the hazard through preparedness, mitigation, prevention and adaptation.• Impact and human responses as evidenced by a recent wild fire event.• Characteristic human responses – fatalism, prediction, adjustment/adaptation, mitigation, management, risk sharing – and their relationship to hazard incidence. <p>AO2</p> <ul style="list-style-type: none">• Response should acknowledge that wildfire is a natural phenomenon which is often exacerbated by human activity. It is the direct and indirect human activities, which | AO1=10 AO2=10 | 20 |

may have contributed to create favourable conditions for the spread of wildfire. The question is whether these activities are contributing to an increase in the phenomena.

- Some may reference data to support argument e.g. research suggests that large wildfires in the United States burn more than twice the area they did in 1970, and the average wildfire season is 78 days longer. Responses which argue in favour of the question may suggest that either human activity has contributed to this or that changes in local / global climate may have exacerbated the issues.
- Research shows that climatic factors, especially earlier snowmelt due to warming in the spring and summer, have led to hot, dry conditions that boost this increase in fire activity in some areas. For much of the US West for example, projections show that an average annual 1 degree Celsius temperature increase would increase the median burned area per year as much as 600 percent in some types of forests.
- Land use and firefighting tactics can play a role in lowering or raising risks and this human activity may feature in some responses.
- Wildfire risk depends on a number of factors, including temperature, soil moisture, and the presence of trees, shrubs, and other potential fuel. All these factors have strong direct or indirect ties to wildfire.
- Once a fire starts (data suggests that more than 80 percent of US wildfires are caused by people) temperatures and dry conditions can help them spread and make them harder to put out. Warmer, drier conditions also contribute to the spread of the mountain pine beetle and other insects that can weaken or kill trees, building up the fuels in a forest.
- Others may consider changes in agriculture practice as causal factors. The recent wildfires in Amazonia have a direct causal link to slash burn techniques combined with a drier summer period.
- With hurricanes, there is similar evidence in support of the question. Sea temperature is generally accepted as being a major contributor to the increasing intensity and arguably frequency of events.
- Although scientists are uncertain whether climatic factors will lead to an increase in the number of hurricanes, candidates can reasonably argue that warmer ocean temperatures and higher sea levels are expected to intensify their impacts.
- Recent analyses suggests that the strongest hurricanes occurring in the North Atlantic have increased in intensity over the past two to three decades. For the United States for example, models project up to a 90% increase in the frequency of Category 4 and 5 hurricanes.
- Hurricanes are subject to two main climate influences: warmer sea surface temperatures could intensify tropical storm wind speeds, potentially delivering more damage if they make landfall. Scientists expect up to an 11% increase in average maximum wind speed, with more occurrences of the most intense storms. Warmer seas also mean more precipitation. Rainfall rates during these storms are projected to increase by about 20 percent and,

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| | | <p>as Hurricane Harvey showed in 2017, this can sometimes be the more destructive impact.</p> <ul style="list-style-type: none"> • Some may consider local factors such as coastal geology as well as spring high tides, which when combined with low pressure systems, can exacerbate impacts. There is some evidence that heightened sea levels intensified the impact of Hurricane Sandy, which caused an estimated \$65 billion in damages in New York, New Jersey, and Connecticut in 2012. Much of this damage was related to coastal flooding. • The notion of increased hurricane frequency is debatable. • Globally, about 70 to 110 tropical storms form each year, with about 40 to 60 reaching hurricane strength. But records show large year-to-year changes in the number and intensity of these storms. • Frequency and intensity vary from basin to basin. In the North Atlantic Basin, the long-term (1966–2009) average number of tropical storms is about 11 annually, with about six becoming hurricanes. More recently (2000–2013), the average is about 16 tropical storms per year, including about eight hurricanes. <p>Whatever the approach, there should be more than one hazard considered and a clear overarching response to the question.</p> | | |
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Marking Level Criteria:

| Level/Mark Range | Criteria/Descriptor |
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| TOP LEVEL 4 (16-20 marks – 80+% - typically an A* answer) | <ul style="list-style-type: none"> • Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question. Interpretations are comprehensive, sound and coherent (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts, processes and interactions and change throughout (AO1). |
| HIGH LEVEL 3 (11-15 marks – 55-75% - B to A grade answer) | <ul style="list-style-type: none"> • Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question. Interpretations are generally clear and support the response in most aspects (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts, processes and interactions and change (AO1) |
| LOWER LEVEL 2 | <ul style="list-style-type: none"> • Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). Interpretations are partial but do support the response in places. |

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| <p>(6-10 marks – 30-50% - D-C grade answer)</p> | <ul style="list-style-type: none"> • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change. There may be a few inaccuracies (AO1). |
| <p>LOW LEVEL 1 (1-5 marks) - <25% - E or below answer</p> | <ul style="list-style-type: none"> • Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). Interpretation is basic. • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts, processes and interactions and change. There may be a number of inaccuracies (AO1) |
| <p>LEVEL 0 (0 marks) – no answer provided</p> | <ul style="list-style-type: none"> • Nothing worthy of credit (something has gone ridiculously wrong if you're here!) |