

**Geography A**

General Certificate of Secondary Education

Unit **A674/02**: Issues in our Fast Changing World (Higher Tier)

**Mark Scheme for June 2013**

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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## Annotations

Annotation	Meaning
	Correct Response (use only to credit in point marked questions).
	Incorrect Response (use only to indicate incorrect in point marked questions).
	Information omitted.
	Unclear.
	Irrelevant.
	Development.
	Two statements are linked.
	To indicate the full extent of a statement which is credited.
	Level one.
	Level two.
	Level three.
	Point has been seen and noted.
	Benefit of doubt given.

All answers and pages with a response must have at least one annotation to show that they have been seen.

Question			Answer	Marks	Guidance	
					Content	Levels of response
1	(a)	(i)	<p>2001 – 2010 was the warmest decade on record ✓.</p> <p>The amount of polar ice is decreasing ✓.</p> <p>Glaciers are melting ✓.</p> <p>This shows the Earth's climate is getting warmer <b>DEV</b>.</p>	2	<p>Annotate the evidence used with a ✓ and the change in climate with a <b>DEV</b>.</p> <p>The <b>DEV</b> might be before the ✓.</p> <p>For two marks candidates need to identify a change in the Earth's climate and give one piece of evidence to support this.</p> <p>Reference to change needs to be qualified. How is it changing?</p> <p>If candidates use relevant examples that are not in the booklet they can still gain credit for their answer.</p>	
		(ii)	<p>Ideas such as:</p> <p>An increase in the number of cars ✓ will lead to an increase in the amount of greenhouse gases released in the atmosphere <b>DEV</b>.</p> <p>Countries such as China and India will grow their economies ✓ leading to the addition of more greenhouse gases <b>DEV</b>.</p> <p>More factories in the world ✓.</p> <p>An increase in the amount of deforestation ✓.</p> <p>More CO<sub>2</sub> is being released ✓.</p>	2	<p>Credit each reason with a ✓.</p> <p>Credit a developed point with a <b>DEV</b>.</p> <p>Credit ideas that express the idea of an increase or continuation of factors contributing to global warming rather than a list of causes.</p>	

Question		Answer	Marks	Guidance	
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(b)	(i)	<p>Greenhouse gases naturally exist/ are already in the atmosphere ✓.</p> <p>Most of the Sun's rays are absorbed by the Earth ✓.</p> <p>Some of the Sun's rays are reflected ✓.</p> <p>However the greenhouse gases in the atmosphere trap/absorb some of this heat ✓.</p> <p>The gases involved include carbon dioxide or methane ✓.</p> <p>Short wave radiation enters the atmosphere ✓.</p> <p>The Earth re-radiates/ reflects long wave radiation ✓.</p>	4	<p>Annotate each correct point with a ✓</p> <p>Credit additional relevant information from own knowledge.</p> <p>Give candidates the benefit of the doubt if it is not clear whether the answer refers to incoming or reflecting radiation being trapped by the atmosphere but do not credit the idea that incoming radiation is being trapped by greenhouse gases where it is explicitly stated.</p> <p>No credit should be given for reference to the ozone layer.</p>	
	(ii)	<p>The increasing amount of greenhouse gases from burning fossil fuels ✓.</p> <p>More heat is trapped within the Earth's atmosphere ✓.</p> <p>This leads to an increase in temperatures ✓.</p>	3	<p>Annotate each correct point with a ✓</p> <p>Credit any other relevant source of greenhouse gases.</p>	

Question		Answer	Marks	Guidance	
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2	(a)	<p>The warmest year to date was recorded ✓.</p> <p>1987 was recorded as the warmest year ✓.</p> <p>1987 and 1995 were recorded as the warmest years on record to date ✓✓.</p> <p>The Stern Report confirms the findings of the IPCC ✓.</p> <p>2010 was the wettest year on record ✓</p> <p>The fact that the years keep getting warmer provides evidence that the IPCC were correct ✓.</p>	3	<p>Annotate each correct point with a ✓</p> <p>Maximum of two marks for simply stating when the warmest years occurred.</p> <p>Do not credit the idea it is getting hotter every year as the evidence does not support this.</p>	
	(b)	<p>Solar flares lead to more heat radiating from the sun ✓ and can increase temperatures ✓.</p> <p>Carbon dioxide ejected from volcanoes adds to the greenhouse gases in the atmosphere ✓ trapping more heat in the Earth's atmosphere ✓ causing the temperature to rise ✓.</p> <p>Volcanic ash when ejected from volcanoes can block heat from the sun ✓ causing a cooling of the Earth ✓.</p> <p>When the angle of the tilt of the Earth increases ✓ there are greater differences between summer and winter ✓.</p> <p>When the Earth's orbit or angle of tilt changes ✓ periods of warming or cooling can occur ✓.</p>	4	<p>Annotate each correct point with a ✓</p> <p>Award 1 mark for describing each cause and additional marks for explaining how the Earth's climate is changed.</p> <p>No marks should be awarded for direct lifts from the resource booklet.</p> <p>Allow credit to a maximum of two for descriptions of the natural causes of climate change.</p>	

Question		Answer	Marks	Guidance	
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	(c)	<p>China is top of the ranking for carbon dioxide emissions (23%) whilst second lowest ✓ in carbon dioxide emissions per person (5 tonnes) ✓.</p> <p>China is top of the ranking for carbon dioxide emissions (23%) whilst the USA is second ✓ (18%) ✓.</p> <p>China is top of the ranking for carbon dioxide emissions (23%) whilst the USA is second ✓ (18%) ✓. This contrasts with the carbon dioxide emissions per person where the USA is 18 tonnes but China is only 5 tonnes ✓.</p> <p>China is top of the ranking for carbon dioxide emissions (23%) whilst the USA is second ✓ (18%) ✓. This contrasts with the carbon dioxide emissions per person where the USA is 18 tonnes but China is only 5 tonnes ✓. This is due to the USA using more cars ✓.</p> <p>This is due to China having a higher population ✓ with 1325 million people compared to the population of the USA (305 million) ✓.</p>	4	<p>Annotate each correct point with a ✓</p> <p>For full marks candidate needs to:</p> <ol style="list-style-type: none"> <li>1. Describe the difference between countries, highlighting where they are in the tables (first, largest, smallest, in the middle).</li> <li>2. Use a minimum of one country's position in both tables OR one country's position in one table and another country's position in the same table.</li> <li>3. Suggest a reason for the differences.</li> <li>4. Use data from the resources to illustrate the description or explanation that has been made.</li> </ol> <p>Population data can be used to illustrate the explanation provided.</p> <p>Do not credit countries that are not in Resource 5 or 6.</p> <p>Data that is not supported by a description or explanation is limited to 1 mark.</p>	

Question		Answer	Marks	Guidance	
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	(d)	<p><b>Indicative content</b></p> <p>Effects on <b>people</b> include those linked to coastal erosion, storm surges and river flooding such as damage to houses and crops; loss of life in extreme weather events such as hurricanes or heatwaves; changes in farming as yields are negatively affected by drought, pests and diseases, though in other places crop yields may increase; coastal erosion caused by rising sea levels and threats to some cities as a result of sea level rise.</p> <p>Effects on the <b>natural environment</b> include damage to ecosystems such as coral reefs; loss of species such as the polar bear as their habitat is lost due to ice melt; increase in other species which adapt to the changing climate, such as starfish and jellyfish.</p> <p>Remember to only mark the first answer relating to human impacts and the first answer relating to physical impacts.</p> <p>Use the resource booklet to help you decide what counts as one impact such as, “Food”, “Water” or “Ecosystems” from Resource 8 or “Longer, more severe droughts and outbreaks of pests and diseases” from Resource 7.</p>	8	<p>Use <b>DEY</b> in the text of the answer to show where a developed statement has been made. Place a <b>11</b>, <b>12</b> or <b>13</b> symbol at the end of the answer. Do not use a  in this style of question.</p> <p>Use <b>1111</b> if candidates include more than one human or more than one physical impact.</p> <p>Focus of the question is on how specific impacts of climate change affect people and the natural environment – expect better candidates to add structure by looking at positive and negative <b>or</b> fully developing their answers. Top band answers must also include detailed support from the Resource Booklet for both the description and the explanation.</p>	<p><b>Level 3 (7–8 marks)</b> A thorough, clearly structured answer which both describes and explains in detail how the chosen impacts of climate change affect people <b>and</b> the natural environment with support from the resources. Written work is legible and spelling, grammar and punctuation are accurate. Meaning is communicated very clearly.</p> <p><b>Level 2 (4–6 marks)</b> An answer containing some developed points which describes and explains how the chosen impacts of climate change affect people <b>and/or</b> the natural environment. Includes some support from the resources. Written work is legible and spelling, grammar and punctuation are mostly accurate. Meaning is communicated clearly.</p>

Question			Answer	Marks	Guidance	
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						<p><b>Level 1 (1–3 marks)</b>                      Outlines some points which describe how the chosen impact of climate change affect people <b>and/or</b> the natural environment. May attempt to explain these. Limited support from resources. Written work contains mistakes in spelling, grammar and punctuation, which sometimes hinders communication.</p> <p><b>0 marks</b>                      No evidence submitted or response does not address the question.</p>

Question			Answer	Marks	Guidance	
					Content	Levels of response
3	(a)	(i)	<p><b>Adapt:</b></p> <p><b>Insulating buildings</b> will be relevant if a place is cooler due to climate change ✓ and more heating is needed to warm the building ✓.</p> <p><b>Storing grain</b> means if there are periods of drought and crops fail or outbreaks of pests and diseases ruin crops ✓ people will not starve ✓.</p> <p><b>Farmers can plant different crops</b> which are more suited to the changing climate so food supplies are maintained ✓ and people do not starve ✓.</p> <p>Building <b>flood defences</b> prevents homes and businesses flooding ✓ if sea level ✓ or increased storms bring heavy rains.</p> <p><b>Weather advice</b> services can warn people about severe storms or heatwaves ✓ so they can make preparations to stay safe ✓.</p> <p><b>Afforestation</b> means that trees are planted to stop flooding ✓ and soil erosion occurring ✓.</p>	2	<p>Annotate each correct point with a ✓</p> <p>Marks are for the explanation and not the choice of response, but the response selected must be correct.</p> <p>2 marks for full explanation of <b>how</b> the selected response to climate change helps people live with the impacts of climate change.</p>	

Question			Answer	Marks	Guidance	
					Content	Levels of response
		(ii)	<p><b>Mitigate:</b></p> <p><b>Insulating buildings</b> means less energy is used for heating ✓ which reduces emissions from power stations ✓.</p> <p><b>Afforestation</b> increases the number of trees which absorb carbon dioxide ✓. This reduces the amount of greenhouse gases in the atmosphere ✓.</p> <p>The <b>increased use of public transport</b> means less fuel is used and fewer emissions are produced which cuts down ✓ the amount of greenhouse gases collecting in the atmosphere ✓.</p> <p><b>Greater use of solar panels</b> on homes reduces the amount of fossil fuels ✓ which are burnt in power stations and cuts greenhouse gas emissions ✓.</p>	2	<p>Annotate each correct point with a ✓</p> <p>Marks are for the explanation and not the choice of response, but the response selected must be correct.</p> <p>2 marks for full explanation of <b>how</b> the selected response to climate change helps reduce the rate of climate change.</p>	

Question		Answer	Marks	Guidance	
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	(iii)	<p>Adaptation strategies require money ✓</p> <p>In MEDCs people and governments are aware of the need for adaptation and mitigation and have the technology and money ✓ to build sea defences or provide weather advice services [D-FV]. In LEDCs, people do not have the money to afford sea defences and are less prepared to deal with the consequences [D-FV].</p> <p>LEDC has greater challenges to face than climate change ✓ such as poverty [D-FV].</p> <p>People in LEDCs may not be fully educated about the consequences of climate change ✓ [D-FV].</p> <p>Governments in some LEDCs may be corrupt/ lack law and order ✓ [D-FV].</p>	4	<p>Annotate each correct point with a ✓</p> <p>Credit a developed point with a [D-FV]</p> <p>Point mark 4 x 1 and allow development marks.</p> <p>Avoid double credit, especially the idea that MEDCs have more money whilst LEDCs have less, but allow the development of converse ideas if developed in different ways.</p> <p>No credit should be given for terms such as resources or facilities without exemplification.</p>	

Question		Answer	Marks	Guidance	
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	(b)	<p><b>Indicative content</b></p> <p>Problems have been created for the fishermen as climate change combined with pollution has exacerbated the growth of the water hyacinth on Lake Victoria. This free floating plant which grows very quickly and forms mats on the surface of the water depletes the oxygen, killing off fish. This means the fishermen can no longer make a living. In contrast local women have found an opportunity to make an income from the water hyacinth. With the help of a UK based charity, Team Kenya, they are using the plant to make furniture such as chairs and coffee tables as well as smaller items such as magazine racks and mats. These are sold locally and also used in the local eco-cottages. This means that the women are able to make a living.</p>	6	<p>Use  in the text of the answer to show where a developed statement has been made. Place a ,  or  symbol at the end of the answer. Do not use a  in this style of question.</p>	<p><b>Level 3 (5–6 marks)</b> Clear understanding of both the problems and opportunities created by the growth of the water hyacinth. Well supported by information from the resource booklet. Written work is legible and spelling, grammar and punctuation are accurate. Meaning is communicated very clearly.</p> <p><b>Level 2 (3–4 marks)</b> Some understanding of both the problems and/or opportunities created by the growth of the water hyacinth. Some supporting information from the resource booklet. Answer may lack balance. Written work is legible and spelling, grammar and punctuation are mostly accurate. Meaning is communicated clearly.</p>

Question			Answer	Marks	Guidance	
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						<p><b>Level 1 (1–2 marks)</b> A limited understanding of the problems and/or opportunities with little or no support from the resources. Written work contains mistakes in spelling, grammar and punctuation, which sometimes hinders communication.</p> <p><b>0 marks</b> No evidence submitted or response does not address the question.</p>

Question		Answer	Marks	Guidance	
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	(c)	<p><b>Indicative content</b></p> <p>Expect a wide range of answers to this question. Approaches might include:</p> <p>The global scale of the problem and the difficulties of getting everyone to agree global treaties such as the Kyoto Protocol.</p> <p>The continuing debate about the causes of global warming or the impact of natural sources of carbon dioxide on the atmosphere.</p> <p>The need for some countries to develop, continuing the emission of greenhouse gases or the unwillingness of other countries to alter their lifestyle such as the use of cars burning fossil fuels.</p> <p>The cost of strategies to adapt to climate change or of trying to reduce emissions by alternative energy sources and that the impacts are felt more in LEDCs than MEDCs.</p> <p>The historical legacy of carbon emissions in the atmosphere means that it is difficult to deal with because it may take a long time for carbon levels to return to a normal level.</p>	6	<p>Use  in the text of the answer to show where a developed statement has been made. Place a ,  or  symbol at the end of the answer. Do not use a  in this style of question.</p>	<p><b>Level 3 (5–6 marks)</b> A clear, well structured response which demonstrated sound understanding of the issue of climate change and an awareness of why it is a difficult problem to deal with. Answer is based on a range of resources. Written work is legible and spelling, grammar and punctuation are accurate. Meaning is communicated very clearly.</p> <p><b>Level 2 (3–4 marks)</b> Answer demonstrates some understanding of the issue of climate change and an awareness of why it is a difficult problem to deal with. Some resources are used and some evidence is clear. Written work is legible and spelling, grammar and punctuation are mostly accurate. Meaning is communicated clearly.</p>

Question			Answer	Marks	Guidance	
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						<p><b>Level 1 (1–2 marks)</b> Generalised statements about the climate change issue. Lacks reference to resources and has no specific ideas about why climate change is a difficult problem to deal with. Written work contains mistakes in spelling, grammar and punctuation, which sometimes hinders communication.</p> <p><b>0 marks</b> No evidence submitted or response does not address the question.</p>

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