Mark Scheme (Results)

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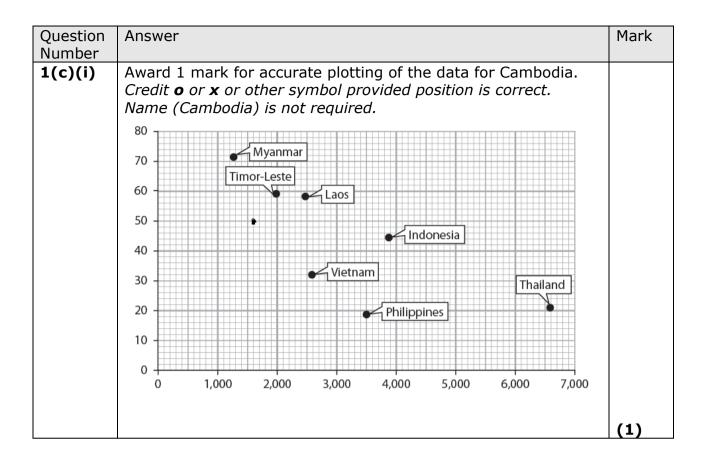
General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
1(a)	Award 1 mark for any of the following up to a maximum of 2 marks. • Idea of trees stopping some water movement / acting as barrier (may refer to interception) (1) • Idea of slower movement of water from canopy to ground/soil (1)movement of water via canopy / leaf surfaces (1) • Evaporation from leaves (1) • Regulates/controls/slows water moving into soil (1) **Accept any other appropriate response, including use of specialist terminology drawn from paper 2, sections 4.7 and 4.8.**	**1 + 1** **(2)**

Question Number	Answer	Mark
1(b)(i)	Award 1 mark for any of the following: • Boreal/Taiga/coniferous forest (1) • Tundra/Arctic/Polar (1) **Accept any other appropriate response.**	 **(1)**

Question Number	Answer	Mark
1(b)(ii)	Award 1 mark for a basic identified way and 1 mark for further explanation, up to a maximum of 2 marks: • Vegetation helps control how much carbon dioxide/carbon is in the atmosphere (1) by using it / taking it in as part of the photosynthesis/respiration process (1) • Vegetation affects oxygen levels (1) by releasing it / taking through photosynthesis/respiration (1) • Water vapour levels are affected (1) by vegetation transipration (1) **Accept any other appropriate climatic factor.**	 **(2)**

Question Number	Answer	Mark
1(c)(i)	Award 1 mark for accurate plotting of the data for Cambodia. *Credit **o** or **x** or other symbol provided position is correct. Name (Cambodia) is not required.*	**(1)**

Question Number	Answer	Mark
1(c)(ii)	Award 1 mark for a suggested relationship based on the data shown and one mark for expansion, up to a maximum of 2 marks. • Lowest GDP corresponds with high forest cover e.g. Timor compared with Thailand (1) suggesting the relationship is one of increased development leading to increased exploitation (1) • Negative correlation (1) e.g. as GDP rises from 1300 to 6600, cover falls from 71 to 21% • As a country develops, deforestation increases (1) e.g. because of use of wood by industry (1) Marking notes Stating the data for one country only does not merit award of the expansion mark (as one country's data alone cannot exemplify a relationship). **Accept any other appropriate response**.	**(2)**

Question Number	Answer	Mark
2(a)(i)	Award 1 mark for a valid adaptation: • Drip-tip leaves • Buttress roots • Very high/tall growth • Broad leaves • Evergreen **Accept any other appropriate response**.	**(1)**

Question Number	Answer	Mark
2(a)(ii)	Award 1 mark for any of the following: • Siamese rosewood smuggling is still rising • Ban doesn't work as it does not apply to private land Do not credit comments about tigers.	**(1)**

Question Number	Answer	Mark
2(a)(iii)	B 700 km Rationale – correctly uses the scale to make a correct estimate of shortest direct distance . The other options are either too high or low.	**(1)**

Question Number	Answer	Mark
2(b)	In each case, award 1 mark for a reason based on Section B of the Resource Booklet, and one mark for further explanation of why this is a cause of biodiversity reduction, up to a maximum of 2 marks. • Illegal logging linked with Chinese demand for rosewood for furniture (1) may lead to habitat loss for other species in the forest (1) • Chinese demand for tiger products may be why there have no sightings since 2007 (1) which could indicate species loss / extinction (1) **Accept any other appropriate response**.	**2 + 2** **(4)**

Question Number	Answer	Mark
2(c)	Award 1 mark for a contribution based on Figure 5, and 1 mark for explanation of how/why this is environmentally, economically or socially sustainable, up to a maximum of 2 marks. • Graph shows that less forest is cut inside Protected Areas/ecotourist resort (1) This is saving forest for the future / future generations (1) • Park ranger jobs are provided for local people (1) this is helping to protect/maintain the community/forest (1) **Accept any other appropriate response**.	**(2)**

Question Number	Answer	Mark
3(a)(i)	Award 1 mark for: • fuel source derived from fossilised remains of plants • carbon-rich rocks/liquids/gases found in the Earth's crust • ancient organic matter turned into a useable fuel • non-renewable energy • formed/developed over long time periods **Accept any other appropriate response**.	**(1)**

Question Number	Answer	Mark
3(a)(ii)	Award 1 mark for any fossil fuel other than conventional oil. • Coal • Gas • Tar sands • Unconventional fossil fuel • Shale gas / oil Marking notes Do not credit wood and charcoal (biofuels) **Accept any other appropriate response**.	**(1)**

Question Number	Answer	Mark
3(a)(iii)	Award 1 mark for the required manipulation of data and 1 mark for correct answer. For example: [(2200-1700) / 1700] x 100 (1 mark) = 29.4 (1 mark) Must have 1 DP only. <u>Further marking notes</u> Award 1 mark only for (2200/1700) x 100 = 129.4	**(2)**

Question Number	Answer	Mark
3(a)(iv)	Award 1 mark for a basic explanation and 1 mark for further development, up to a maximum of 2 marks: • General idea that it can be used again (1) e.g. unused parts of biofuel crop can serve as nutrients to grow more crops (1) **Accept any other appropriate response**.	**(2)**

Question Number	Answer	Mark
3(b)(i)	Award 1 mark for a basic explanation and 1 mark for further development, up to a maximum of 2 marks: • Charcoal because has been processed / dried (1) so burns better / is more efficient/improved source of energy (1) • Charcoal bricks are lighter than wood (1) which means they can be transported more efficiently/cheaply (1) • Charcoal produced carbon-rich fumes (1) suggesting it burns well / produces high amounts of energy (1) <u>Marking notes</u> Do not credit 'charcoal is a cheap fuel' (or similar). **Accept any other appropriate response**.	**(2)**

Question Number	Answer	Mark
3(b)(ii)	D 2017 - 2018 Rationale – correctly indentifies growth from 0.78 to 0.85 (+0.07). All other intervals are much lower (both absolute and relative growth).	**(1)**

Question Number	Answer	Mark
3(b)(iii)	In each case, award 1 mark for a problem based on Figure 7 and /or Figure 8 and one mark for some explanation of why the problem may be worsening over time, up to a maximum of 4 marks. **National parks** • Loggers are already in the National Parks / deforesting the parks (1) and the damage will worsen due to rising demand from a growing population in Phnom Penh (1) • Nearby forests have already been removed (1) which means loggers will now push deeper into national parks to meet the demand (1) **Cities** • Charcoal generates smoke (1) and the problem is worsening now there are 600 factories using biofuels (1) • Atmospheric pollution in cities is caused by people buring charcoal (1) and the population is growing (1) **Accept any other appropriate response**.	**2 + 2** **(4)**

Question	
3 (c)	**AO3 (4 marks)/AO4 (4 marks)** Answers should address the reasons why charcoal is used as a source of energy in Cambodia. The assessment may offer a view on which reason matters most. **A03** • Population pressure means increased energy demand inevitable • In a developing country, many people will opt for whatever is cheapest and may be less concerned with the environment • Cambodia needs to develop and its factories need a cheap energy source • Government could provide alternatives but has not acted • Government inaction may also be linked to corruption and bribery • One view might be that population pressures combined with weak governance are the most important reason(s) why charcoal is still used **A04 (using Figures 8 and 9, as directed)** • Population numbers are increasing, this means more energy is needed (Figure 8) • Over 600 factories in Phnom Penh use charcoal for cheap energy (Figure 8) • Demand in the cities is high because it is a cheap source of energy (Figure 8) • Organised crime gangs control the charcoal trade and no-one can stand up to them e.g. killing of Chut Wutty (Figure 9) • No-one has stopped the loggers from going deeper into the forests to find new sources of charcoal (Figure 9) • Several sources agree corrupt government is at heart of problem (Figure 9)

Level	Mark	Descriptor
	0	No acceptable response
Level 1	1−3	Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4−6	Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7−8	Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question Number	Answer	Mark
3(d)	Award 1 mark for a basic explanation and one mark for an expansion, up to a maximum of 2 marks. • Biofuels can be grown locally instead of importing energy (1) which protects a country from external shocks/prices rises/international tensions (1) • Biofuels are cheap/practical/easy way to increase energy supply (1) which offers future protection against rising energy demand / prevents shortages (1) • The more diverse the energy mix (1), the more secure a population/country can be against possible future events/risks (1) **Accept any other appropriate response.**	**(2)**

Question Number	
3 (e)	**AO3 (4 marks)/AO4 (4 marks)**
Answers should address the work of different local and global players. The assessment may offer a view on which player has done the most good.
A03
• All of the players/actions help save/replace some trees and so have value
• However, in all cases the contributions may be small compared with total forest loss caused by the charcoal industry
• Given the strength organised crime gangs, there may be a limit to how far any strategy/player can succeed
• One view might be that Arbor Day could be a long-term success because children may grow up to value the forest more than previous generations
• One view might be that industries have the greatest impact because they are changing how people cook, not just the fuel they use
• Local actions/players may prove more effective than global actions/players

AO**4**
• The UN REDD project would protect the Cardamom mountains forests but it has not yet been approved (Figure 10)
• The Wildlife Alliance has stopped illegal activities e.g. 7 arrests (Figure 10)
• However, there are not enough rangers and the companies quickly re-equip the logging gangs (Figure 10)
• Local communities are doing their bit and children are involved (Figure 10)
• However, only 1000 ha of forest is replaced by community action (Figure 10)
• Businesses are saving around 1000 trees each year and have impact on the way people cook also, requiring fewer trees (Figure 10) |

Level	Mark	Descriptor
	0	No acceptable response
Level 1	1−3	Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3)
Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4−6	Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3)
Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7−8	Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3)
Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Q	Indicative content
4	**AO2 (4 marks)/AO3 (4 marks)/AO4 (4 marks)** In order to fully justify a choice, the candidate must consider all three options and establish a clear argument. There is no preferred option. All options can be as justified as offering some level of short-term (ten years) government-led envionmental protection. The balance of the case will vary according to the option chosen. - Option 1 – if forest is immediately replanted and charcoal trade is properly managed it may be possible to protect remaining primary forest while providing citizens with the cheap charcoal energy they want. However, does not address the local health problems and GHG emissions linked with charcoal use, and is not truly sustainable. - Option 2 - stricter laws could help reduce or stop deforestation. Local and global players already help with this, and the government could join them in partnership. However, charcoal and rosewood gangs may keep breaking laws unless the governement acts in other ways e.g. develops alternative, cheap energy sources. - Option 3 – developing ecotourism offers an economic model which makes use of forest resources in sustainable ways. But scale of income generated may be insufficient to cater for a large developing population's needs over next 10 years. **A02** - Alternative forms of sustainable energy could be used (wind, solar, hydropower) - Many governments support/promote/subside particular types of energy while taxing/discouraging other types (e.g. carbon taxes) - Sustainability has multiple dimensions – social/economic/environmental - Afforestation policies have been introduced successfully by many governments - Ecotourism projects in other countries contribute to GDP while also providing employment for indigenous people (responsible ecotourism) - CITES and REDD will work in partnership with national governments to manage forests more sustainably **A03** - Measures to stop illegal deforestation may not succeed as rainforest is a difficult environment to police – but rapid short-term changes could be made with funding - As long as there is the high demand for cheap charcoal, deforestation will continue and so the government urgently needs to develop/subsidise alternatives too - Replanting trees to harvest for charcoal will help the environment in some ways (water cycle, biodiversity issues) but not others (air pollution from charcoal burning) - Managing the charcoal industry sustainably would have social and economic benefits for loggers and their families – especially in short-term - Ecotourism would protect forest, the ecosystem services it provides, and local/global biodiversity, so strong arguments in favour - though perhaps more long-term - However, too much forest has been lost already - can biodiversity loss be reverse? **A04** - The vital role of forest in the water and carbon cycles can be safeguarded to a varying extent by each option (Fig 1). - Economic development, forest loss and biodiversity loss are linked issues (Figure 2,3) and each option has some merit in trying to break the links - So long as Chinese demand for rosewood is high, illegal logging is likely whatever actions government takes (Figure 3,4) - Existing ecotourism and hydropower could be developed further (Figure 5, 6). - Environmental and social costs of charcoal use (Figure 7) will only worsen if nothing is done, based on projections and views (Figure 8, 9) - A range of existing local and global players (Figure 10) could potentially work alongside Cambodia's government to protect the forest

Marks for SPGST		
Performance	**Marks**	**Descriptor**
SPaG 0	0	*No marks awarded* • Learners write nothing. • Learner's response does not relate to the question. • Learner's achievement in SPaG does not reach the threshold • performance level, for example errors in spelling,
SPaG 1	1	*Threshold performance:* • Learners spell and punctuate with reasonable accuracy. • Learners use rules of grammar with some control of • meaning and any errors do not significantly hinder meaning • overall. • Learners use a limited range of specialist terms
SPaG 2	2−3	*Intermediate performance* • Learners spell and punctuate with considerable accuracy. • Learners use rules of grammar with general control of • meaning overall. • Learners use a good range of specialist terms as appropriate.
SPaG 3	4	*High performance* • Learners spell and punctuate with consistent accuracy. • Learners use rules of grammar with effective control of • meaning overall. • Learners use a wide range of specialist terms as appropriate.