Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

THINKING SKILLS	**9694/43**
Paper 4 Applied Reasoning	**October/November 2018**
MARK SCHEME	
Maximum Mark: 50	

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

Cambridge Assessment
International Education

[Turn over

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

<table>
<tr><td>
GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

    the specific content of the mark scheme or the generic level descriptors for the question
    the specific skills defined in the mark scheme or in the generic level descriptors for the question
    the standard of response required by a candidate as exemplified by the standardisation scripts.
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GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).
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GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

    marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
    marks are awarded when candidates clearly demonstrate what they know and can do
    marks are not deducted for errors
    marks are not deducted for omissions
    answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.
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GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.
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GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
1	*1 mark for any of the following:* The wards on which the hand-sanitisers were installed might have had death rates that were significantly different from the hospital's total. *(Just 'not representative' not good enough)* The introduction of hand-sanitisers on half of the wards seems to provide the opportunity for comparison but the quoted outcome makes no mention of the death rates on wards with or without hand sanitisers. The year of the study might have been atypical. Capital City Hospital might not be typical of other hospitals. Particularly since they are a 'centre of excellence for major surgery' they might attract a more 'likely to die' patient demographic than others in the country. The use of hand-sanitisers might have a disproportionately large effect on patients undergoing major surgery and hence the change cannot be extrapolated to hospitals in general. Only 'advice' was issued – we don't know if it was followed or not. Other hospitals might already have hand sanitisers, so the extrapolation might not apply to them. Such a study is not likely to have occurred in isolation from other interventions. The announcement of a new measure is likely to induce a degree of 'Hawthorne' effect within patients and staff, hence an improvement in outcomes. Any one item selected from a population is unlikely to conform to the mean. 8% might be within normal annual fluctuations. 8% is rounded up from 7.6% but the former is used to calculate the headline figure. The projection should have been 20 000, as only half the wards in the hospital were measured.	**5**

Question	Answer	Marks
2	*1 mark for each element (maximum 4 if MC not identified).* **CA** Legends of dragons and other creatures … stretch back millennia. **MC** Such legendary creatures neither exist now, nor have they existed in living memory. **CA** Science is constantly discovering new species of animal, **IC** If it existed, we would have found it by now. **IC** (So) there cannot be enough fish in Loch Ness for them to eat. **IC** There is a distinct lack of hard evidence for the monster. **IC** (Aliens do not exist and) neither does the Loch Ness Monster [exist]. **IC** The real reason all these mythical beast stories persist is money.	**6**

Question	Answer	Marks

3	*2 marks for a developed version of any of the following points.*
	1 mark for a weak or incomplete version of any of the following points.
	
	Paragraph 1
	
	    Generalisation – from the Loch Ness Monster to all legendary creatures / Weakly supported MC – the argument focuses almost entirely on the Loch Ness Monster and so does not support a conclusion about legendary beasts in general.
	    The use of 'so-called' is an attempt to prejudice the reader against the idea that monsters might exist (*ad hominem*).
	
	Paragraph 2
	
	    Assumption – that the Loch Ness monster is as large as a bus.
	    Assumption – that the shore of Loch Ness has beaches upon which things can wash.
	    Contradiction – having stated that newly discovered species are all small, the author now gives an example of a large newly-discovered species, the colossal squid.
	    The example of a large newly-discovered species supports the counter-position to that of the author.
	
	Paragraph 3
	
	    Assumption – that 'monster' occupancy is more likely in larger bodies of water.
	    Assumption – that the Loch Ness Monster eats fish.
	    Assumption – that the Monster is confined to the waters of Loch Ness.
	    Assumption – that the Loch Ness Monster is a reproductive species, rather than a long-lived individual.
	    Overdrawn IC – without further information about the number of fish that can live in 7.5 km^3 of water, or the productivity of Loch Ness, we cannot be sure that a sufficient population of fish could not supported in this volume of water.
	
	Paragraph 4
	
	    The absence of evidence is not evidence of absence (confuses a sufficient condition with a necessary condition).
	    There is an element of straw man/generalisation, in that the author chooses weaker aspects of the eyewitness testimony in order to dismiss all of it.
		9

Question	Answer	Marks
3	*Paragraph 5* *ad hominem* – the author is drawing attention to the weakened credibility of some eyewitnesses. (However, the fact that they live near Loch Ness might fuel a vested interest but it also supports a strengthened credibility based on ability to see. It is not surprising that most witnesses live in the area in question.) Causal flaw – citing exposure to tourism money as the reason for frequent sightings when proximity to Loch Ness is an equally logical reason.	

Question	Answer	Marks
4	**'The Yeti is nothing more than a myth.'**	**30**
	Specimen Level 4 Answers	
	Support (760 words)	
	Humans love to tell stories. The various yeti legends are just human story-telling. Doc 1 is argues that one famous monster myth – the Loch Ness Monster, is false. It is true that Doc 1 contains many flaws and its main conclusion – that mythical beasts do not exist is generalised from a single example. However, the example of the Loch Ness Monster does illustrate how human imagination can create myths and, one could, given space, argue a similar case against the Yeti. The existence of the Yeti is nothing more than a myth.	
	We should be sceptical about the existence of a large mammal unknown to science. Docs 1 and 5 state, and Doc 3 implies, that new species are regularly discovered by scientists. Doc 1 states that most of these are small, which could be consistent with the title of Doc 5, but Doc 1 does appear to contradict itself with mention of the colossal squid. However, oceans are much bigger and less well-explored than the Himalayas so the counter-example is less damaging to Doc 1's case than might appear at first glance. Doc 5 lists many 'recently'-discovered large animals, which does support the possibility of the Yeti being real. However, it is noteworthy that none of those believed to be mythical have been discovered in the last 50 years. This, during a period in which technological advances have greatly increased our ability to find things. Hence the squid and the panda are less relevant to the 21st century Himalayas than some might think.	
	Doc 1 states that money is a main reason why mythical creature stories persist. It is easy to see how this would apply to the Loch Ness Monster but might have less relevance for the Yeti, where stories are much older and there is no single point at which all sightings cluster for tourists to congregate and part with their money. The reasons for the existence of the Yeti myth are likely to pre-date money.	
	Stories are used for entertainment and to scare children. One can imagine a Himalayan family gathering at night round the fire to tell stories of a frightening 'beast'. The idea of such a creature could have been used to discourage children from wandering off on their own at night. The memory of the 9-year-old girl in Doc 4 illustrates why this might be a useful strategy. Interestingly, it seems that the Yeti is known by other names in other languages, as evidenced in the use of the word 'migoi' in Doc 4. This is exactly what one would expect with an unfounded myth – humans create stories and the words to embellish them.	

Question	Answer	Marks
4	When there is any debate about a particular issue it is always best to go with the scientific evidence. Some of the evidence in the Docs sounds 'sciencey', particularly all of Doc 3 and the reports about faecal and hair analysis in Doc 2. Most of the samples in Doc 3 were from modern species. The only non-mundane pieces of evidence are the unknown parasite in Doc 2 and the sample apparently from a prehistoric bear in Doc 3. These samples are unremarkable. Faecal parasites are, almost by definition, very small and, if Doc 5 represents large unknown animals, there must be a vastly larger list of unknown small ones. Unknown parasites (and their hosts) exist and prehistoric bears existed but there is no suggestion that these samples were the start of the Yeti myth any more than the horses, cows and dogs also mentioned in Doc 3 or the antelope in Doc 2. So these two apparently interesting samples do not represent proof that the Yeti exists. Doc 3's publication in the Proceedings of the Royal Society makes its methods credible, but it should not be used to claim anything beyond what the scientists have stated in Doc 3. In the same way that some scientists disagree about the extent of climate change, none disagree that it is happening. So, one should not dismiss the idea of something merely because there is some academic disagreement about the nature of the phenomenon. However, that is not what is happening in this case. The scientists in Doc 3 are not saying that 'there is a Yeti but we don't quite know what it looks like'. They are merely saying 'We have been sent some samples from the Himalayas and one was from a prehistoric bear'. Without strong evidence to the contrary we must conclude that, like, Bigfoot and the Loch Ness Monster, the Yeti is nothing more than a myth. *Challenge (744 words)* It is possible that the various yeti legends are just human story-telling. Humans do like to tell stories and many of these are false. However, because some are false does not mean that all are. Doc 1 tries to claim that, because stories of aliens are false, so too are stories of the Loch Ness Monster and, by implication, the Yeti. However, because one weird creature story is not true does not mean all are. Doc 5 mentions that stories of the giant panda were not believed for centuries; it turned out to be a type of large bear. Similarly, the yeti is probably a very real animal – possibly a large bear, or possibly unknown to science. Either way, it is more than a myth. We should not be sceptical about the existence of a large mammal unknown to science. Docs 1 and 5 state, and Doc 3 implies, that new species are regularly discovered by scientists. Doc 1 is self-contradictory about the potential size of these species but the possibility of the Yeti being the size of a large bear is corroborated by the many large, recently discovered species listed in Doc 5. It is difficult to compare area of land with volume of water but, if we use 'number of living things that can be supported' as a measure of habitat size, then it seems clear that the Himalayan region is much bigger than Loch Ness. Hence the counterarguments put forward in Doc 1 about a large animal species not having enough food or being able to hide are not valid.	

Question	Answer	Marks
4	Doc 1 states that money is a main reason why mythical creature stories persist. It is easy to see how this would apply to the Loch Ness Monster but not so much with the Yeti. There is no single point at which all sightings cluster for tourists to congregate and part with their money. Interestingly, it seems that the Yeti is known by other names in other languages, as evidenced in the use of the word 'migoi' in Doc 3. This is exactly what one would expect with the name of a well understood species – I imagine that the Bhutanese, Nepalese and Tibetan words for bear, horse and monkey also vary.	
	When there is any debate about a particular issue it is always best to go with the scientific evidence. Some of the evidence in the Docs sounds 'sciencey', particularly all of Doc 3 and the reports about faecal and hair analysis in Doc 2. The report that an unknown parasite was found in potential yeti faeces supports the claim in Doc 3 that some of the hair samples they were sent were unknown to science. Of course, the Doc 2 faeces and the Doc 3 hair might not have been from the same animal but they both support the idea that there is something large and unknown out there.	
	At first glance, one of the hair sample reports in Doc 2 might sound like it contradicts Doc 3. Doc 3 claims the hairs were from a bear, while Doc 2 claims they were from an antelope. However, on closer examination they do support each other. Doc 3 admits that many of the specimens they sent were from well-known animals, so the antelope specimens in Doc 2 are not inconsistent. Many people have relics of what they claim to be a yeti, only one of them has to be an unknown species for the unknown species to exist. Even if the evidence from Doc 2 were contradictory, Doc 3 is by far the more credible document. It is more recent, meaning that hair analysis techniques are more advanced. More importantly, the research was published in the Proceedings of the Royal Society, which means the research will have been scrutinised and criticized by fellow scientists before publication was allowed.	
	There is some disagreement about the nature of this unknown beast. Some, e.g. Doc 3, suggest 'bear', others, e.g. Docs 2 and 4 suggest primate. Both options are consistent with the list of species in Doc 5. But disagreement about the nature of the beast does not mean the beast does not exist. In the same way that some scientists disagree about the extent of climate change, none disagree that it is happening. Whatever these witnesses saw, they saw something. So the stories we have about the yeti have some basis in fact and are, therefore, are likely to be more than myth.	

Level	Structure	Max 8	Quality of argument	Max 8	Use of documents	Max 8	Treatment of counter positions	Max 6
4	Precise conclusion and accomplished argument structure with consistent use of intermediate conclusions. Likely to include at least two of the following: strands of reasoning suppositional reasoning analogy evidence examples Argument is structured so the thought process is made clear. Uses vocabulary of reasoning appropriately and effectively to support argument.	7–8	Cogent and convincing reasoning which answers the question which was asked. Subtle thinking about the issue. Use of relevant own ideas and ideas from documents. Very few significant gaps or flaws.	7–8	Perceptive, relevant and accurate use of documents to support reasoning. References 3+ documents. Sustained and confident evaluation of documents to support reasoning. (Two or more valid **evaluative** references to documents). Able to combine information from two or more documents and draw a precise inference.	7–8	Consideration of key counter arguments and effective response to these. Use of own ideas in response to counter arguments not mentioned in the documents. Use of valid critical tools to respond to counter arguments. Effective use of appropriate terminology.	5–6
3	Clear conclusion that is more than 'I agree'. Clear argument structure, which may be simple and precise or attempt complexity with some success. Appropriate use of intermediate conclusions. Use of other argument elements to support reasoning. Generally makes thinking clear. Appropriate use of vocabulary of reasoning.	5–6	Effective and persuasive reasoning which answers the question which was asked. (Although there may be some irrelevance or reliance on dubious assumptions.) Use of own ideas and ideas from documents. Few significant gaps or flaws.	5–6	Relevant and accurate use of documents which supports reasoning. References 3+ documents. Some evaluation **and** comparison of documents to support reasoning. Inference drawn from at least 1 document.	5–6	Consideration of key counter arguments and effective response to these. Response uses own ideas or is developed from documents. Some use of appropriate terminology.	3–4

Level	Structure	Max 8	Quality of argument	Max 8	Use of documents	Max 8	Treatment of counter positions	Max 6
2	Conclusion stated but may be 'I agree'. Sufficient clarity for meaning to be clear throughout. Structure may be easy to follow but brief or a longer argument which has a less clear structure. Uses reasons. Some appropriate use of vocabulary of reasoning.	3–4	A reasoned stance which attempts to answer the question which was asked. Some support for the conclusion. (Although there may be considerable irrelevance or reliance on dubious assumptions.) Some thinking/own ideas about the issue. Use of rhetorical questions and emotive language. Some significant gaps or flaws.	3–4	Some relevant use of documents to support reasoning, but some documents used indiscriminately. Some comparison of documents **or** some critical evaluation of documents **or** reasoned inference drawn from document.	3–4	Inclusion of counter argument or counter assertion. Response is direct but weak or taken entirely from documents.	2
1	Attempt to construct an argument. Unclear conclusion, multiple conclusions or no conclusion. Disjointed, incoherent reasoning. Use of examples in place of reasoning. Possibly a discourse or a rant. Reasons presented with no logical connection. Documents considered sequentially. Substantial irrelevant material.	1–2	Attempt to answer the general thrust of the question. Attempt to support their view. Excessive use of rhetorical questions and emotive language. Ideas which are contradictory.	1–2	Some, perhaps implicit, use of documents. No attempt at critical evaluation. No comparison of documents.	1–2	Inclusion of counter argument or counter assertion. Response is direct but ineffective.	1