Example Candidate Responses
(Standards Booklet)

Cambridge International AS and A Level
Thinking Skills
9694
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The main aim of this booklet is to exemplify standards for those teaching Cambridge International AS and A Level Thinking Skills (9694), and to show how different levels of candidates’ performance relate to the subject’s curriculum and assessment objectives.

In this booklet a range of candidate responses has been chosen as far as possible to exemplify grades A, C and E. Each response is accompanied by a brief commentary explaining the strengths and weaknesses of the answers.

For ease of reference the following format for each paper has been adopted:

- Question
- Mark scheme
- Example candidate response
- Examiner comment

Past papers, Examiner Reports and other teacher support materials are available on http://teachers.cie.org.uk
To achieve an AS Level in Thinking Skills, each candidate must successfully complete Papers 1 and 2.

### Advanced Subsidiary qualification

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<td>‘Problem Solving’&lt;br&gt;30 multiple choice questions&lt;br&gt;Maximum mark 30&lt;br&gt;Weighted at 50% of total.</td>
<td>‘Critical Thinking’&lt;br&gt;3 structured answer questions&lt;br&gt;Maximum mark 45&lt;br&gt;Weighted at 50% of total.</td>
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To achieve an A Level in Thinking Skills, each candidate must successfully complete Papers 1, 2, 3 and 4.

### Advanced Level qualification

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<td>‘Problem Analysis and Solution’&lt;br&gt;4 structured answer questions&lt;br&gt;Maximum mark 50&lt;br&gt;Weighted at 25% of total.</td>
<td>‘Applied Reasoning’&lt;br&gt;4 questions, one requiring an extended response&lt;br&gt;Maximum mark 50&lt;br&gt;Weighted at 25% of total.</td>
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Teachers are reminded that a full syllabus is available on [www.cie.org.uk](http://www.cie.org.uk)
Question 1

1. Study the evidence and answer the questions that follow.

A road accident occurred at the junction of Wordsworth Road and Shelley Road (see plan). A white car hit a red car. Because roadworks were taking place on Wordsworth Road, traffic was reduced to one lane, controlled by temporary traffic lights.

**Source A**

**Statement**

by Alice, the driver of the red car

I waited at the temporary traffic lights on Wordsworth Road in order to turn left into Shelley Road as soon as they changed to green. A blue car was waiting immediately behind me. As soon as a line of three cars had made their way through the road works, I checked that there was no more traffic coming towards me and then turned left, but a white car appeared out of nowhere and hit the side of my car. I am sure I would not have moved off until the traffic lights showed green.

**Source B**

**Statement**

by Ben, passenger in the red car

The accident occurred when my mother was driving me to school. I was not watching the traffic lights, because I was deep in conversation with my mother, but I am sure it showed green when she moved off. I did not see the white car until a split second before it hit us.

**Source C**

**Statement**

by Colin, rider of the motor-cycle

I waited at the end of Shelley Road, intending to turn left into Wordsworth Road as soon as the lights had changed and both the red car and the blue car had gone. I could not see the temporary traffic lights from my position. I did not see the white car until a moment before it hit the red car, but I don’t think it could have been speeding, because it would have been impossible to drive fast through the roadworks. I do not know either of the drivers.
Source D

Statement
by Dennis, the driver of the white car

As I approached the roadworks, the temporary traffic lights showed green. So I did not need to stop. I noticed the lights turn to red as I passed them. As I came out of the roadworks, a red car suddenly turned in front of me. Although I was travelling quite slowly, it was impossible to avoid a collision. A motorcyclist who had witnessed the accident immediately offered to give evidence on my behalf, because he thought the driver of the other vehicle was at fault.

Source E

Letter from Alice’s insurer

We have agreed with the insurer of the other driver to treat both drivers as equally responsible for the accident. Each company will bear the cost of the repairs to their client’s vehicle. Both drivers will have to pay more for their insurance in future.

(a) If the driver of the blue car can be found, how significant will his/her evidence be?  [3]

(b) Whose evidence is more reliable, Ben’s (Source B) or Colin’s (Source C)? Explain your answer.  [3]

(c) How useful is the letter from the insurance company (Source E) in deciding who was responsible for the accident? Explain your answer.  [3]

(d) Who do you think was responsible for the accident at the junction of Shelley Road and Wordsworth Road? Write a short, reasoned argument to support your conclusion, with critical reference to the evidence provided and considering plausible alternative scenarios.  [6]
Mark scheme

1 (a) If the driver of the blue car can be found, how significant will his/her evidence be? Explain your answer. [3]

Very significant [1] if he/she remembers whether the traffic light turned to green before the red car started moving/turmed left [1]. Or, if they had important information about the behaviour of the white car driver [1]. Of very little significance otherwise [1].

Significant because he/she is an eye-witness/can confirm the colour of the traffic light [1].

(b) Whose evidence is more reliable, Ben’s or Colin’s? Explain your answer. [3]

Credit up to three of the following points:

Colin’s evidence is more reliable [1]. He has no vested interest to misrepresent the truth [1], because he does not know either driver and was not personally involved in the accident [1]. Although Colin admits that he could not see the temporary traffic light (ability to see) [1], he carefully differentiates between what he did and did not see [1]. Ben has strong vested interest to misrepresent the truth in favour of his mother [1]. Although he claims to be sure that the light was green when the car moved off, and he was in a position potentially to see it [1], he has also admitted that he was not paying attention (poor ability to see) [1].

Maximum 2 if only one side considered. Maximum 2 if no explicit judgment.

(c) How useful is the letter from the insurance company in deciding who was responsible for the accident? Explain your answer. [3]

Of little or no use [1], because the insurance company has no independent ability to see what happened [1] but has strong vested interest to interpret events in its own favour [1]. The letter produces no evidence about culpability [1] and does not attempt to assign blame [1].

(d) Who do you think was responsible for the accident at the junction of Shelley Road and Wordsworth Road? Write a short, reasoned argument to support your conclusion, with critical reference to the evidence provided and considering plausible alternative scenarios. [6]

| Level 3 5–6 marks | A strong answer, which provides a reasoned argument including thorough evaluation of the evidence to support an acceptable conclusion and evaluates the plausibility of at least one different possible course of events. |
| Level 2 3–4 marks | A reasonable answer, which evaluates the evidence, draws an acceptable conclusion and may mention the plausibility of at least one different course of events. |
| Level 1 1–2 marks | A weak answer, which refers to the evidence, possibly including a simple evaluative comment. The conclusion may be unstated or over-stated. |
| Level 0 0 marks | No credit-worthy material. |
Indicative content

Alice was [mainly] responsible for the accident, because drivers should always check before turning left that there is no traffic coming towards them.

The evidence that the traffic light had turned green before Alice moved off is weak (vested interest), but no other evidence directly contradicts it.

Dennis may have been partly to blame, if he drove through the temporary traffic lights as they turned red or shortly after, and if he failed to slow down (although, according to Colin, it would have been impossible for him to drive really fast under the conditions of the road). Several points of evidence suggest that this may have happened, but none states it directly. It is possible that the traffic lights were faulty or badly adjusted, so that one side turned green before traffic from the other direction had time to pass through the roadworks.
Example candidate response – grade A

1a. The driver in the blue car’s statement would be valid and significant as he/she had a view of the red car, the white car and the temporary traffic lights in front of them. Therefore the evidence would be used against the other statements to see who’s in corroborates with and who’s it contradicts. However, if the driver was not paying attention an extra statement would still be valid due to his position in the incident.

1b. When taking into account both statements it’s clear that Ben would have a vested interest to support and evidence on behalf of the mother as she would naturally want to prevent her from getting into any trouble when looking at Colin’s statement the clearly states that he did not know either of the drivers, and was situated during the accident his statement would be incredible valid. The fact that he immediately offered to give evidence on behalf of details does not imply he knows them however it does raise certain questions. Ben’s statement is very brief and so is Colin’s as it this statement the says he could not remember whether the lights were green or red (source B). Therefore taking both statements into consideration in my opinion the person’s statement whom I believe would be the most reliable would be source C as at this point there is no clear vested interest and he had a clear view of the accident whereas Ben was deep in conversation with his mother.
C. The letter from the insurance company is not useful at all, when it comes to deciding who is responsible for the accident. As the statement blames both drivers for being "equally responsible" for the accident and states that both drivers will have to pay more for their insurance in the future, the statement does not give an account of what happened and therefore if the police were to look at it all they would be able to gather is that neither of the two drivers were paying attention and as they both knew they were to blame they came to an agreement. The letter is from Alice's insurer which must also be taken into consideration as she may have a vested interest which would make the statement unreliable and possibly biased.

D. I believe Alice was to blame for the accident. In statement A it says that she was not 100% certain whether or not the lights were red but this is then further supported by her son as she could not have been paying full attention to the road as they states they were in deep conversation. Statement D is the most detailed account of the accident and even though she may obviously have a vested interest the other accounts are far too brief and therefore cannot contradict what Dennis's statement says. In Dennis's statement he says that a motorcyclist who we now know as Court immediately offered to give evidence on behalf
Examiner comment – grade A

(a) The answer is of an appropriate length and correctly identifies the salient points, namely how the evidence might be able to contribute to the case and that this contribution is dependent on the driver having paid attention. This was sufficient to be awarded three marks out of three, despite the eccentric opinion expressed in the last two lines.

(b) The answer is more developed and repetitive than necessary, but answers are not penalised for including superfluous material and it was awarded three marks out of three. The candidate makes a correct judgement (that Colin’s evidence is more reliable than Ben’s) based on correct contrasts in respect of vested interest and ability to see.

(c) The answer begins by making a valid judgement, which is then supported by two valid reasons. Even though the point about the insurer’s vested interest is not explained, this answer was awarded three marks out of three.

(d) The answer suggests a solution based on consideration of most of the evidence. Although the candidate evaluates the sources persuasively, an alternative scenario was not considered and this answer therefore could not be awarded more than four marks out of six.

Mark awarded = 13 out of 15
1. (a) The contextual information provided by the owner of the blue car may be of relevance if in the telling of the account if included the colour of the traffic lights which would provide factual evidence to corroborate either the driver of the white or the red car’s statement. It would be significant because it is very likely that no vested interest after the version. Nevertheless it could consider the importance of the data it provides (if relevant or not).

(b) Source B corresponds to a witness involving vested interests so the account may be altered to prove innocence of his mother. Anyway, it is of great importance the fact stated by Ben that says that he was deep in conversation with his mother which may have distracted his mother as uncertain. On the contrary, Celin’s statement is more likely to be objective as no vested interest involve him and he explicitly mentions both drivers are strangers to him. Because of this, Source C is more probably more reliable.

(c) The latter does not provide sufficient evidence to decide on the blame and responsibility of the drivers, due to lack of evidence for and against either two of the car drivers involved. It was agreed that each company would pay for the repair of their clients’ cars. This source is backed by the first 3 sources (A-B-C) which fail to state the colour of the traffic lights to decide on a responsible driver. Source D cannot be considered reliable due to being partial to himself (his wife car owner).

(d) All sources A, B and D are partial to their own interest in trying to prove the guilt and this makes it difficult on deciding who is responsible. A plausible explanation can be that as source B states the driver of the red car was having a conversation with a passenger which it is
Examiner comment – grade C

(a) The answer was awarded two marks out of three because it correctly identifies the potential usefulness of the evidence while recognising some doubt. However, the candidate has not explained that the evidence would be useless if the driver had not noticed or had forgotten when the traffic light changed to green. The last two sentences are irrelevant.

(b) The answer was awarded three marks out of three because it makes a valid point concerning Ben’s vested interest to support his mother, correctly explains why Colin does not have a vested interest and then draws the correct inference that Colin’s evidence is more reliable than Ben’s.

(c) The answer was awarded one mark out of three because the correct judgement does appear to be based on a correct understanding of the evidence, rather than being a lucky guess, but no specific justification is identified clearly enough for a further mark.

(d) The answer shows some good evaluation of sources but it does not make much use of the detailed evidence and was therefore awarded only two marks out of six.

Mark awarded = 8 out of 15
Example candidate response – grade E

A) The driver of the blue car is crucial because he/she had an overview of the accident, they witnessed the accident at close range. The blue car was in the perfect position from his standpoint to see who’s fault it was. The blue car was behind Ali’s car and could have easily seen it, the traffic light was green according to Ali, therefore the blue car must have been behind her as they were forming, which makes him an expector and could have seen who caused the accident.

B) Colin’s evidence seems to be more reliable because he was at the intersection with a clear overview of the accident. Ben, on the other hand, was in the red car, “not watching the traffic” as he says, because he was having a deep conversation with his mother. Ben was not fully aware and concentrating on the road, he was talking to his mother and didn’t see the car until the last second, therefore his evidence might be unreliable or biased. Colin is more reliable because he saw who hit first and who is at fault, but he offered to give evidence on behalf of Ben.

C) The letter is very useful as it decides to not put the blame on one driver, it splits the blame equally. It is not biased toward any of the drivers, unlike the evidence from Colin and Ben who are inclined to blaming the other driver. The insurance decides to split the costs for the repairs of the vehicle and equally raise the insurance prices. The letter doesn’t really specify who caused the accident.
Examiner comment – grade E

(a) The answer was awarded one mark out of three. The candidate recognises that the driver of the blue car could potentially have seen whether the traffic light had or had not turned to green before the red car moved off, but fails to realise that the usefulness of the evidence depends crucially on what the driver noticed and remembered.

(b) The answer gives a correct judgement, supported by one reason on each side, namely that Colin had a “plain overview of the accident”, whereas Ben was “not fully aware and concentrating on the road” because he was talking to his mother. This was sufficient to be awarded three marks out of three.

(c) Although the answer recognises that the companies had not attempted to attribute responsibility between the two drivers but had decided to treat them as equally responsible, it wrongly judges that this makes the document “very useful”. It was therefore awarded no marks.

(d) The answer gives a possible reconstruction of events, but does not consider an alternative scenario. Although the candidate does attempt to evaluate the sources, the judgements are eccentric. Colin offered to give evidence in favour of Dennis because of what he saw, which does not make him “very biased”. Since Ben was not paying attention, the fact that “it can be assumed that he will give evidence on behalf of his mom” does not really help to decide what happened. This answer was awarded two marks out of six.

Mark awarded = 6 out of 15
Question 2

2 Study the evidence and answer the questions that follow.

Source A

Homoeopathy is a form of alternative medicine which treats patients with medicines which are prepared by repeatedly diluting a substance until only a very small amount – if any – of the original substance remains. Supporters of homoeopathy claim that after this repeated dilution the water retains a 'memory' of the substance. Critics argue that homoeopathy should not be accepted as a valid medical treatment because the theory fails to meet scientific criteria.

Source B

Extracts from online chatroom

Dr Asif
As a doctor for more than forty years and a homoeopath for the last twenty, I know that homoeopathy is a most valuable tool and nine times out of ten my treatment of choice. One only has to see its dramatic effect in treatment of fevers, depression, anxiety, pain, to become a convert. It does work! Furthermore, no homoeopathic remedy has ever been withdrawn or banned because it was dangerous.

Dr Branchflower
The danger with homoeopathic treatments is not that anyone will fall ill from taking them – since they basically only contain water or sugar, that is highly unlikely. They are dangerous because people may take them for serious illness instead of a proven treatment, and may die or suffer as a result.

Mrs Courtney
My daughter was diagnosed with a thyroid complaint that would have meant a lifetime on medicine, with all sorts of possible side-effects and at goodness knows what expense. This medicine would never have been a cure – it would just have made her less ill. After 6 months of homoeopathic treatment, her blood tests were completely normal and she was bouncing around like she never had before. Hers is not an isolated case, and certainly not due to the placebo* effect, since she was dragged most unwillingly to see the homoeopath, and proclaimed that she didn’t believe in any of it!

Dr Branchflower
Unfortunately you don’t say what the condition was, nor who made the diagnosis, nor what other medication was being taken, nor what other medical conditions had been diagnosed... and a whole host of other important complicating factors. Not all thyroid ‘complaints’ require lifetime treatments. Many illnesses eventually come to a natural end without being treated, and this was probably one of them. It is certain that the homoeopathic treatment did absolutely nothing, since it contained no active medical ingredient.

* The placebo effect refers to the fact that medical conditions sometimes improve because patients believe they are receiving an effective treatment, even if they are not.
Source C

Some data on Homoeopathy
From pro-homoeopathic web pages

- In France, homoeopathic medicine is the most popular treatment for colds and flu.
- In Germany, some of the most popular remedies for hayfever, colds, sore throats and circulatory problems are homoeopathic.
- In the early 1980s a survey revealed that 80% of newly-qualified doctors in the UK were interested in training in homoeopathy, hypnosis, or acupuncture.
- The chart below shows how 593 patients responded to the question, "Have you seen any improvement in your general health in the year following your homoeopathic treatment?"

![Pie chart showing 72.6% moderate or marked improvement and 27.4% little or none improvement.]

Source D

Doctors have warned that tourists are risking their lives by relying on homoeopathy to protect them against malaria. This warning follows an undercover investigation which revealed that alternative medicine clinics willingly sell travellers homoeopathic protection against malaria despite official advice that there is no evidence that these treatments work. It also comes after a study published in a medical journal claimed that, in some clinical trials, homoeopathic remedies performed no better than sugar pills.

(a) ‘Homoeopathy should be used for all patients.’ Can this be reliably concluded from Dr Asif’s statement (Source B)? Explain your answer. [3]

(b) How effectively does Dr Branchflower reply to Mrs Courtney’s claims (Source B)? Explain your answer. [3]

(c) According to Source D, recent scientific research has suggested that homoeopathy is ineffective as a medical treatment. Can we reliably conclude that people will cease to use homoeopathic treatment as a result of this research? [3]

(d) Should homoeopathy be recognised as a valid form of medical treatment? Write a short, reasoned argument to support your conclusion, using and evaluating the information provided in Sources A – D. [6]
Mark scheme

2 (a) ‘Homoeopathy should be used for all patients.’ Can this be reliably concluded from Dr Asif’s statement (Source B)? Explain your answer. [3]

Credit up to three of the following points:

No/This statement is too strong to be concluded from Dr Asif’s statement [1]. Dr Asif admits that he chooses it in only 9 cases out of 10 [1], which means he does not use it for all patients [1], and the list of conditions for which he claims it has a “dramatic effect” is limited [1], which means it is less effective for some conditions/patients [1].

(b) How effectively does Dr Branchflower reply to Mrs Courtney’s claims (Source B)? Explain your answer. [3]

Credit up to three of the following points:

Dr Branchflower answers Mrs Courtney’s arguments well [1], by pointing out the important information missing from her account of her daughter’s illness [1] and by suggesting alternative explanations for the improvement in her daughter’s condition [1], but he is unlikely to persuade her [1], because he is unable to prove that the improvement did not happen as a result of homoeopathy [1].

Maximum 2 if no judgment.

(c) According to Source D, recent scientific research has suggested that homoeopathy is ineffective as a medical treatment. Can we reliably conclude that people will cease to use homoeopathic treatment as a result of this research? [3]

Credit up to three of the following points:

No/Some people may cease to use it, but others will continue [1]. Since the claim refers only to “some” clinical trials, it is possible that other research has come to different conclusions [1]. Doctors and patients who believe that the results of scientific research are reliable will be influenced against the use of homoeopathic medicine [1], but people (especially of less education [1]) who are more influenced by personal experience and testimony will be swayed by comments such as those by Dr Asif and Mrs Courtney [1]. People who are desperate because orthodox medicine has failed to cure their illness may try homoeopathic medicine as a last resort [1].
(d) Should homoeopathy be recognised as a valid form of medical treatment? Write a short, reasoned argument to support your conclusion, using and evaluating the information provided in Sources A–D. [6]

<table>
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<tr>
<th>Level 3</th>
<th>5–6 marks</th>
<th>A strong, reasoned argument, which uses and evaluates all or most of the evidence provided.</th>
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<tr>
<td>Level 2</td>
<td>3–4 marks</td>
<td>A reasonable, simple argument, which uses and/or evaluates evidence.</td>
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<tr>
<td>Level 1</td>
<td>1–2 marks</td>
<td>A weak answer, which makes some reference to evidence but consists of opinion and/or assertion rather than argument or a weak argument, which makes no reference to evidence.</td>
</tr>
<tr>
<td>Level 0</td>
<td>0 marks</td>
<td>No credit-worthy material.</td>
</tr>
</tbody>
</table>

Maximum 3 marks if conclusion is implied but not stated.

**Indicative content**

Scientific research generally does not support the claims of homoeopathy, and it seems impossible that such heavily diluted materials could have any effect whatever.

Dr Branchflower is right to point out that illnesses often improve spontaneously. The apparent effectiveness of homoeopathy is also often attributed to the placebo effect.

Even allowing for bias or vested interest on the part of Dr Asif and Mrs Courtney’s lack of expertise, their evidence strongly suggest that homoeopathic medicine can help at least some illnesses. The positive reports from patients recorded in Source C (fourth bullet-point) are unreliable for various reasons, but they give at least some support to these claims. Combined with the data about the popularity of homoeopathic remedies in Source C, it seems likely that homoeopathic remedies give some relief from conditions like colds, influenza and anxiety. Even if they are alleviating symptoms rather than curing the underlying condition, that is not necessarily a bad thing, especially when orthodox medicine is unable to offer a cure.

Despite the clear vested interest of the websites to select data to support their own position, the statistics in Source C reveal an increasing willingness amongst medical professionals and the lay public to recognise that various kinds of alternative medicine may have some value.

Since it seems highly unlikely that homoeopathic medicine could harm anyone, it would probably be unreasonable to prevent patients from having access to the materials and to the advice of a homoeopathic practitioner if they wish to have recourse to them at their own expense. However, countries which have a National Health Service could reasonably refuse to supply such remedies, and insurance companies could reasonably decline to pay for them, on the grounds that they lack scientific credibility.
Example candidate response – grade A

2a. This cannot be concluded from Dr Asif’s statement. In his statement, Asif provides a myriad of illnesses for which he’d prescribe homeopathic remedies for, but clearly states that he’d only do so for “nine times out of ten,” acknowledging the fact that some circumstances are too sure.

b. Dr. Branchflower replies to Mrs. Courtney’s claims with extreme effectiveness (Source B). Although the fact Mrs. Courtney stated that her daughter’s blood tests returned to a state of normalcy, and her daughter retained none of the symptoms, Mrs. Courtney does not provide for in her account, as stated by Dr. Branchflower’s response, what the exact condition was, who made the diagnosis, what other medical conditions had been diagnosed, and what other medication she was on that could’ve been the true benefactor.

c. Source D provides a logical argument as to why homoeopathy is an unreliable means of medical treatment. It’s been proven that these “treatments” are little more than sugar water, otherwise known as a placebo. However, due to the widespread use of homeopathic treatments, especially by Europeans (Source C), and that doctors would even be willing to diagnose untested and unregulated medicine indicates that people have come to trust homoeopathy and will likely not cease to use it.

d. Homoeopathy should by no means be used as a valid form of treatment. As provided for in Source A, even by a logical standpoint, it can be surmised that by diluting a substance will lessen its effects, and could thus contribute to longer treatment besides possibly being completely ineffective, which would inturn only amount to a loss of money and decline in long-term health. Source B provides the statement
Examiner comment – grade A

(a) The answer achieved three marks out of three because it makes a correct judgement (that the claim cannot be reliably concluded from Dr Asif’s statement), supported by a developed explanation derived from the details of his statement.

(b) The answer was awarded three marks out of three because a correct judgement (that Dr Branchlower’s reply to Mrs Courtney’s evidence was very effective) is supported by detailed references to his evidence.

(c) The answer begins by explaining why some people probably will refrain from using homoeopathic medicine, and then goes on to give a reason and a judgement that others are unlikely to do so. These three points were awarded three marks out of three.

(d) The answer was awarded six marks out of six because it offers a rational answer to the question, well-supported by detailed evaluative references to all four sources.

Mark awarded = 15 out of 15
Example candidate response – grade C

2(a) No, I don’t think. Although he makes it clear that he thinks homeopathy is a good treatment, he doesn’t choose it for all of his patients. He says how it is useful for many illnesses, but not for all of them; different patients have different illnesses, so this treatment wouldn’t be useful in all cases.

2(b) His answer is quite effective. You cannot make any conclusions which are valid when you don’t know all of the facts, and when you are not expert in that area. His teacher gives the thought that she doesn’t know what she is on about, whilst Dr. Bronchflower gives a reasoned argument with valid points.

2(c) No, you cannot conclude this. Even if there is research done on this treatment, there will always be a counter group, as all aspects of life have. People may have already tried this treatment, and believe that it works, so if it worked for them, why would they have to believe anything else that is not personal experience?

2(d) My opinion is that homeopathy should not be recognised as a valid medical treatment. Dr. Asif says that he would recommend it to most of his patients, but doesn’t say all, and his teacher’s evidence made me think that reliable as she is not a specialist, she only tells an experience, which doesn’t show 100% reliability. Therefore, I don’t agree with the arguments. I personally think Dr. Bronchflower’s argument, I think he gave valid points, and something without medical ingredient can’t make you treat any illness. Although Suze C has very good points in favour.
Examiner comment – grade C

This candidate generally makes correct judgements, but the supporting explanations tend to be insufficiently explicit and detailed.

(a) The answer was awarded two marks out of three because it makes a correct judgement, supported by a correct explanation, but without an explicit reference to the text.

(b) The answer was awarded one mark out of three because it makes a correct judgement but the supporting explanation is not explicit enough to gain marks.

(c) The candidate makes a correct judgement, supported by one rather vague reason. The reason was not specific enough to gain a mark, but it did show that the judgement was more than a lucky guess, so the answer was awarded one mark out of three. The resource documents include examples which could have been used to make the reasoning more explicit, in which case the answer could have gained two or even three marks.

(d) On the basis of the evidence and reasoning provided in the sources, it is easier to argue against accepting homoeopathy than to defend it. This candidate was awarded four marks out of six, because the judgement is fairly well supported by reference to the ideas in the sources, but the evaluation tends to consist of the candidate’s personal opinions rather than objective critique.

Mark awarded = 8 out of 15
Example candidate response – grade E

a. Yes. According to him, it works and is his treatment of choice almost all the time. If it works and doesn't have the same dangers, like he says, it should be used for all patients.

b. Yes. He points out all of her flaws in her comment, then he gives the fact that not all thyroid complaints require lifetime treatments. He then says that many illnesses eventually come to an end without being treated, which because he is a doctor, a reliable source, can be believed.

c. No. There is already so much evidence that homoeopathy doesn't work, so there is no reason why one more piece of evidence will stop them.

d. No. There are too many pieces of evidence that say that it doesn't work to trust the lives of people with it. Also, homoeopathy contains mostly sugar in water and contains no active medical ingredient. This makes it almost no different than a placebo pill, which isn't recognized as a valid form of medical treatment.

Examiner comment – grade E

(a) The answer was awarded no marks because, although the second sentence shows that the candidate has read the source correctly, she has drawn an incorrect inference from it.

(b) The answer gives a brief but accurate judgement, supported by one significant reason, and was therefore awarded two marks out of three. The last two lines of this answer are irrelevant.

(c) The answer makes a correct judgement “No”, supported by one valid reason, and was therefore awarded two marks out of three.

(d) The answer makes a valid but brief judgement “No”, supported by a brief reference to source material (albeit unattributed). It was awarded two marks out of six.

Mark awarded = 6 out of 15
Question 3

3 Read the passage and answer the questions below.

1 Almost everyone admires people who consistently behave unselfishly, putting the welfare of others before their own. This admiration is, however, misplaced, because there is actually no such thing as unselfishness.

2 Since acting for the benefit of others does not contribute to the survival of the individual, those who behave unselfishly are disadvantaged in the struggle of life and fail to pass on their genes, with the result that the trait of unselfishness inevitably disappears. Beginning from this conviction, philosophers and evolutionary psychologists have argued that even those actions which appear to be unselfish must really be selfishness in disguise.

3 Many of the people who behave in apparently unselfish ways are motivated by religion. Most religions teach that unselfish acts will be rewarded in an after-life, either by enjoying bliss in heaven or by being reincarnated into a superior mode of being. But the simple fact that people expect to be rewarded for their actions means that those actions are not unselfish at all, since they are acting for what they believe to be their own long-term benefit.

4 People who are not motivated by religion are also acting selfishly, even when they seem to be putting the needs of other people before their own. They are doing it because they enjoy being thanked and praised for their generosity. It is pleasant to be well regarded by others and to know that they are grateful. There can also be practical benefits in behaving generously towards others, because a situation may arise in the future when the favour can be repaid.

5 An obvious objection to this argument is that some people act in secret, but even anonymous actions are actually motivated by self-interest. The reward in such cases lies not in other people’s expressions of gratitude but in our own inner sense of self-satisfaction at having done the right thing.

(a) Using the exact words from the passage as far as possible, identify the main conclusion. [2]

(b) “...there is actually no such thing as unselfishness.”
Using the exact words from the passage as far as possible, identify three reasons used to support this claim. [3]

(c) Evaluate the reasoning in the argument. In your answer you should consider any strengths, weaknesses, flaws and unstated assumptions. [5]

(d) ‘Selfishness is the best policy.’
Write your own short argument to support or challenge this claim. [5]
Mark scheme

3 (a) Using the exact words from the passage as far as possible, identify the main conclusion. [2]

2 marks: This admiration/admiration of people who behave unselfishly is [however] misplaced.
1 mark: This admiration is, however, misplaced, because there is no such thing as unselfishness.

(b) "...there is actually no such thing as unselfishness."
Using the exact words from the passage as far as possible, identify three reasons used to support this claim. [3]

- Even those actions which appear to be unselfish must really be selfishness in disguise.
- The simple fact that someone expects to be rewarded for their actions means that those actions are not unselfish at all.
- People who are not motivated by religion are also acting selfishly even when they seem to be putting the needs of other people before their own.
- Even anonymous actions are actually motivated by self-interest.

(c) Evaluate the reasoning in the argument. In your reasoning you should consider any strengths, weaknesses, flaws and unstated assumptions. [5]

<table>
<thead>
<tr>
<th>Level 3</th>
<th>Evaluation of strength of argument with critical reference to strength/weakness, including some of: flaws, support given by reasons to intermediate conclusions, use of evidence, inconsistency, analogies, assumptions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4–5 marks</td>
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</tr>
<tr>
<td>Level 2</td>
<td>Relevant extended counter-argument (3 marks). Specific counter-assertions/agreements (2 marks). Single point of evaluation only (2 or 3 marks).</td>
</tr>
<tr>
<td>2–3 marks</td>
<td></td>
</tr>
<tr>
<td>Level 1</td>
<td>Discussion of the topic without specific reference to the passage or general counter-assertion/agreement or weak attempt at evaluation.</td>
</tr>
<tr>
<td>1 mark</td>
<td></td>
</tr>
<tr>
<td>Level 0</td>
<td>No relevant comments. Summary/paraphrase of passage.</td>
</tr>
<tr>
<td>0 marks</td>
<td></td>
</tr>
</tbody>
</table>

Indicative content

- The argument reported in paragraph 2 begs the question/is circular, since it begins by assuming the conclusion.
- The argument in paragraph 2 depends on the assumption that the theory of evolution is true.
- Dubious/unknown whether 'unselfishness' has a genuine genetic basis.
- The appeal to authority in paragraph 2 is partly legitimate, since the reasoning used by the philosophers and psychologists is stated, but the reference to the academic sources is also intended to influence the reader in favour of their claims.
- All of the main points in paragraphs 3, 4 and 5 consist of rash generalization, requiring the controversial assumption that there are no exceptions.
- This argument succeeds in showing how all apparently unselfish behaviour could be based on selfish motives, but it does not show that it always is (confusion of purpose and consequence).
- The whole argument is non-falsifiable and therefore arguably vacuous.
(d) “Selfishness is the best policy.” Write your own argument to support or challenge this claim. [5]

<table>
<thead>
<tr>
<th>Level 3</th>
<th>Developed, coherent argument. Reasons strongly support conclusion. Development may include intermediate conclusion or apt examples. Simply structured argument 4 marks. Effective use of IC 5 marks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 2</td>
<td>A simple argument. One reason + conclusion 2 marks. Two or more separate reasons + conclusion 3 marks.</td>
</tr>
<tr>
<td>Level 1</td>
<td>Some relevant comment.</td>
</tr>
<tr>
<td>Level 0</td>
<td>No relevant comment.</td>
</tr>
</tbody>
</table>

Maximum 3 marks if conclusion is implied but not stated.

No credit for material merely reproduced from the passage.

Indicative Content (specimen 5-mark answers)

Support
Behaving unselfishly is an inefficient basis for community life, because we may often misjudge what other people would like. It would be much simpler if everyone did what they wanted, because no one knows what will please and benefit individuals better than they do themselves.

We are also likely to be more committed to projects which are intended to benefit ourselves than to the good of others. So more good will be done overall.

If everyone acted in their own interests, then overall this would achieve the greatest good of the greatest number. So even though selfishness may seem to be immoral, it would actually produce the most moral results.

Selfishness is the best policy, because it is the most efficient way of maximizing benefits.

Challenge
We enter life with unequal talents, privileges and opportunities. If everyone looked after their own interests, without being concerned for the welfare of anyone else, those inequalities would increase, which would lead to a great deal of unhappiness. A mark of a humane and civilised society, by contrast, is that people look out for one another, and the more favoured help those less fortunate than themselves. That is the kind of community in which we would all like to live.

Not only do all religions exhort their followers to put the needs of others before their own, but all secular moral teaching does the same. There were good reasons why the ideal of unselfishness was set before us all at school.

We all know that selfishness produces much less desirable consequences than unselfishness. So selfishness is not the best policy.
Example candidate response – grade A

Question 3

(a) The main conclusion of the passage is that "there is actually no such thing as unselfishness." (i)

"...Even those actions which appear to be unselfish must really be selfishness in disguise." (ii) Whether acting openly or anonymously, most "actions are actually motivated by self-interest." (iii)

(b) Reason 1 - "Many of the people who behave in apparently unselfish ways are motivated by religion. "They expect to be "rewarded in an after-life," either by enjoying bliss in heaven or by being reincarnated."

But by expecting a reward, "those actions are not unselfish at all since people are acting for what they believe to be their own long-term benefit."

Reason 2 - "People who are not motivated by religion are also acting selfishly, even when they seem to be putting the needs of people before their own. They are doing it because they enjoy being thanked and praised for their generosity."

Reason 3 - "(Even though some people act in secret) "anonymous actions are actually motivated by self-interest. The reward in such cases lies in our own sense of self-satisfaction at having done the right thing."

(c) In the paragraph 2, the author asserts that "unselfishness" is a genetic "trait" that can only be passed on through reproduction, therefore people act selfishly in disguise since the actual
The trait for unselfishness has died off overtime if this is not true, and unselfishness does not come from a gene then this claim is weakened because it is possible that anyone can be unselfish if this trait is not dependent upon a gene.

In paragraph 3, the author reasons very well in deciding that religion is inherently selfish since followers expect to be rewarded for their unselfish acts in an afterlife. This is in fact true, since the desire to obtain something makes whatever acts committed, selfish.

In paragraph 4, the author considers praise and thanks as a selfish motive for committing acts of unselfishness. These cannot be considered rewards since they don’t benefit the recipient in the long-term, which is what the author defines as a reward in the third paragraph. Therefore, enjoying praise for generosity is not selfish, as the author claims. This reasoning carries over to the last paragraph in which the author claims that self-satisfaction is also a selfish motive for unselfish acts. However, since it is produced by oneself and is not a “long-term benefit” as described in paragraph 3, it is not motivated by selfishness.

Lastly, in paragraph 2, the author argues that acting for the benefit of others does not contribute
to the survival of the individual, but by being kind and generous, you make fewer enemies, and people may be more willing to help you, ensuring your survival.

Selfishness is not the best policy. Societies based on selfishness generally tend to result in inequality and major social divides due to concentration of wealth among powerful and minorities. These issues contribute to weak economies and governments, elevated crime and an overall ineffective community. Furthermore, by being unselfish, you can bring other people happiness and build useful friendships. If you ever need help, you would be more likely to receive it, if you were kind and generous to someone else at one point.

Also, many inventions and innovations that have improved our society and helped so many people exist because of the untold dedication of some scientists to improve the human race and help other people. Medicines and vaccines for example which have eradicated disease and saved countless lives exist because decades and scientists unselfishly developed them to help people. Innovations as simple as electricity also serve to improve the general standard of living and make life easier.
Examiner comment – grade A

(a) This candidate has given three answers instead of one and none of them is correct. The first was the most popular answer, but it is incorrect and scored no marks. The candidate has correctly identified the part of the argument containing the conclusion, but has cited the intermediate conclusion immediately leading into the main conclusion rather than the main conclusion itself. The occurrence of the word ‘because’ at the beginning of this clause should have alerted the candidate to the fact that it could not be a main conclusion.

(b) The second and third of this candidate’s answers were accepted as correct, despite including additional material; they are the intermediate conclusions from paragraphs 4 and 5 respectively. The first answer includes part of the intermediate conclusion contained in paragraph 3, but contains too much extraneous material to be accepted.

(c) This candidate’s answer begins by correctly identifying a weakness in the argument, namely the assumption that unselfishness has a genetic basis, and rightly judges that if that assumption is incorrect the argument is significantly weakened. The candidate returns to this point in the last part of this answer, explaining how even if unselfishness does have a genetic basis, it might promote survival, rather than inhibiting it. In the middle part of the answer, the candidate agrees with one part of the argument and disagrees with another part, which would have been worth two marks. Mainly because of the first and last points, the answer was awarded four marks out of five.

(d) The answer was awarded full marks. It is well constructed, consisting of three paragraphs, each of which briefly pursues a distinct line of reasoning. The argument also includes examples (in their third paragraph) and hypothetical reasoning (in their second paragraph). The fact that it would have been easy to argue against their third paragraph is not sufficient reason to reduce the mark.

Mark awarded = 11 out of 15
(3) a) I have come to the conclusion that even unselfish actions made by people are selfish actions. In reality, there is such thing as unselfishness. Some may argue that people motivated by religion are unselfish in hope for rewards in the afterlife. However, even when people do unselfish acts, even anonymously, they do it in the hope of being praised for their generosity or to feel good about themselves.

b) R4: Even anonymous actions are actually motivated by self-interests
R5: Evolutionary psychologists have argued that even those actions, which appear to be unselfish, must really be selfishness in disguise.
R6: Many try to act unselfishly because a situation may arise in the future when the favour can be repaid.

C) The reasoning in the argument is very strong. They give a variety of instances in which you may think you are being unselfish but in reality you really aren’t. The only flaw I see is that there should have been a contrasting piece to 3 where it talking about people not motivated by religion who are unselfish in hope for something greater after death. A weakness I see is that in statement 2, they should have given an actual statement by a philosopher or evolutionary psychologists. Nevertheless, the strength in the reasoning is good in that it gives reasons and hidden motivations.
Examiner comment – grade C

(a) The candidate seems to have misunderstood what was expected. Instead of identifying and quoting the specific clause which is the main conclusion, the candidate has summarised the gist of the argument. This answer was awarded no marks.

(b) The first and second of this candidate’s answers are correct: they are the reasons given in paragraphs 5 and 2 respectively. The inclusion of additional words in the second answer did not prevent it from gaining a mark. The third answer is part of one of the reasons given in support of the first clause of paragraph 4, which in turn supports the main intermediate conclusion.

(c) This candidate’s answer correctly identifies a strength of the argument, but gives no detail. The second point is obscure and the third is not really a point of evaluation. The answer was awarded two marks out of five.

(d) This answer was awarded four marks out of five because it challenges the claim by means of a coherent argument. However, parts of the argument are tied too closely to the passage. The first sentence was accepted as a valid alternative to ‘selfishness is not the best policy’, which was what the examiners expected as the conclusion of an argument challenging the claim. This was awarded four marks out of five.

Mark awarded = 8 out of 15
b) They are doing it because they enjoy being thanked and praised for their generosity.

2. Those who behave unselfishly are disadvantaged in the struggle of life to pass on their genes.

3. Most religions teach that unselfish acts will be rewarded in an after-life.

c) In this argument it states that people who are religious are unselfish and those who are not religious are selfish. This is an assumption because not everyone who is religious is unselfish, and those who are not religious are selfish.

A strength in this argument is that it is humane that everyone acts selfishly against others however do behave generously towards others because a situation may arise in the future when the favour can be repaid.
The fact that some people may be rewarded after re-incarnation is a weakness, as many people do not believe in religion.

d) I disagree with this claim because by being selfish you cannot succeed in life. Although it is natural for humans to think selfishly and act selfishly, I believe people should go out of their way to help others, not only to know that if a situation arises in the future where they need them to repay the favour but to accomplish finishing your life knowing that you have accomplished a lot and helped many people. By being selfish you can lose many friends and people who care about you, and miss out on a lot of opportunities and experiences.

At times it may be hard to put others before thinking about yourselves however in the long term those who are unselfish will benefit, and be remembered by others.
Examiner comment – grade E

(a) The candidate has identified the correct part of the argument as the conclusion, but has also included a supporting reason and was therefore awarded one mark out of two. The word ‘because’ should have alerted the candidate to the fact that the sentence consists of two argument elements.

(b) None of this candidate’s answers are correct. All of them consist of part of the explanation justifying the claims in paragraphs 4, 2 and 3 respectively. It is those claims which directly support the main intermediate conclusion, “there is actually no such thing as unselfishness”. This part therefore achieved no marks.

(c) This answer was awarded one mark out of five for making some comment on the issue (the second point of the candidate’s three comments). The first comment is based on a misreading of the passage, which neither claims nor implies that religious people are unselfish but irreligious people are selfish. Similarly, the third point is not a valid response to the passage.

(d) The answer was awarded four marks out of five because it challenges the claim by means of a coherent argument. The first clause, “I disagree with this claim”, was accepted as a valid alternative to ‘selfishness is not the best policy’.

Mark awarded = 6 out 15
Question 1

1 Study the information below and answer the questions. Show your working.

The ruins of old Ilyrian temples in the featureless plains of Bolandia have been used as a source of stone blocks for building houses over the years, so the various photographs that have been made over time show columns of different heights. As it’s usually cloudy, there are no shadows to help to determine from which direction any particular picture has been taken. All temples originally had columns that were made from six blocks, and all the blocks were identical cylinders, one cubit in height. No blocks have been added to the temples since they were originally built.

One temple has four columns, and this is a plan view showing the heights (in cubits) of the columns now:

```
   N       E
   W       S
```

```
  5   6
  2   4
```

This is written as \( \frac{5}{2} \frac{6}{4} \), with the north shown at the top.

From the north we see which we write as \( 6 \ 5 \).

From the south we see and write \( 5 \ 6 \).

From the east we see and write \( 4 \ 6 \).

From the west we see and write \( 6 \ 4 \).

(a) A different temple of four columns also has the heights \( 5 \ 6 \) as seen from one side and \( 4 \ 6 \) from another.

(i) What is the greatest possible total number of blocks in this ruin? [1]

(ii) What is the smallest possible total number of blocks in this ruin? [1]
(b) Two pictures of another four-column ruin have been found.

(i) Draw a possible plan view of the ruin to show that these pictures could have been taken at the same time.

A further picture of the same ruin was found.

(ii) Give the order in which they were taken, and draw a possible sequence of plan views showing the ruin at the three times.

(c) A larger ruin had nine columns arranged in a 3 by 3 square. Originally they were all 6 cubits high. From one side it now appears as $5 \ 4 \ 5$ and from another as $4 \ 2 \ 5$.

(i) What is the greatest number of blocks that can be there now?

(ii) What is the greatest number of blocks that can have been taken away?
1 (a) A different temple of four columns also has the heights 5 6 as seen from one side and 4 6 from another. The arrangement must be equivalent to \( \begin{array}{c}
5 & 6 \\
? & 4
\end{array} \) or \( \begin{array}{c}
5 & 6 \\
4 & ?
\end{array} \).

(i) What is the greatest possible total number of blocks in this ruin? \[1\]

The ‘hidden’ digit cannot be greater than 4, giving a total of \( 5 + 6 + 4 + 4 = 19 \).

(ii) What is the smallest possible total number of blocks in this ruin? \[1\]

The ‘hidden’ digit cannot be less than 0, giving a total of \( 5 + 6 + 4 + 0 = 15 \).

OR

Candidates may assume that columns cannot have 0 blocks: \( 5 + 6 + 4 + 1 = 16 \).

(b) Two pictures of another four-column ruin have been found.

(i) Draw a possible plan view of the ruin to show that these pictures could have been taken at the same time. \[1\]

\( \begin{array}{c}
6 & 3 \\
2 & 2
\end{array} \) or equivalent. One of the 2s could be 0 or 1.

(ii) A further picture of the same ruin was found. From this it is now certain that the three pictures A, B and C were all taken at different times. Give the order in which they were taken, and draw a possible sequence of plan views showing the ruin at the three times. \[4\]

1 mark for correct order of pictures B, A, C.

A possible sequence of plans would be:

\[
\begin{array}{c|c|c|c}
3 & 6 & 2 & 6 \\
2 & 5 & 2 & 5
\end{array}
\]

3 marks for a possible triplet of plans showing B, A and C. If 3 marks cannot be awarded, award 1 mark if it is possible to move from the 1st to the 2nd to the 3rd plan by just removing blocks/leaving them unchanged (they are ‘internally consistent’) AND award 1 mark if 2 of the plans could represent the views they purport to show.
(c) A larger ruin had nine columns arranged in a 3 by 3 square. Originally they were all 6 cubits high. From one side it now appears as 5 4 5 and from another as 4 2 5.

(i) What is the greatest number of blocks that can be there now? [1]

The global maximum is reached when each element is the smaller value of the row and column maxima:

<table>
<thead>
<tr>
<th></th>
<th>4</th>
<th>2</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
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<tr>
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<td>4</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

These sum to 32.

(ii) What is the greatest number of blocks that can have been taken away? [2]

There must be at least one of the max value in each row and column, but this local minimum is not sufficient to get the global minimum, e.g.

<table>
<thead>
<tr>
<th></th>
<th>4</th>
<th>2</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

[1 mark for a solution such as this (54 – 20 = 34)
OR 1 mark for a similar solution in which the zeros are ones : 30]

By placing the 4 so as to provide both row and column, and given that the 5s cannot be under anything smaller, we have a range of possible answers such as

<table>
<thead>
<tr>
<th></th>
<th>4</th>
<th>2</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

The 2 could be at any point in the column.
This sums to 16, but working is required.
Originally 9 x 6 = 54 blocks, so the most taken away is 54 – 16 = 38.
ALTERNATIVELY a solution in which the zeros are ones, giving 54 – 21 = 33
[2 marks for either underlined answer seen]

A correct diagram without a clear stated answer should be credited 1 mark.
Example candidate response – grade A

1) a) i) 24 19
   ii) 15 8

b) i) 3 6 A
   2
   For this column any number of shoes is possible. I chose 1.

ii) Time

  5  | 4 | 3
  A  B  C

  2 6
  2 6

  A

  5 4 5
  2 2 2
  4 4 4

ii) 54 5
  2 0 0
  4 0 0
  54 - 20 = 34 blocks
  the greatest number
Examiner comment – grade A

(a) No working is needed to gain these marks. The candidate has clearly identified 19 blocks and 15 blocks as their answers. The candidate’s initial attempt at (a)(i) is neatly crossed out, to avoid any confusion.

(b) (i) The candidate has offered one diagram, showing the four columns unambiguously, with appropriate numbers of blocks in each. The candidate has included where pictures A and B were taken from, and explicitly commented on the range of possibilities available for one of the columns. This is not required by the question, and gains the candidates no marks – but such additions are advisable if there is any doubt about what detail is required.

(iii) The candidate has made three attempts at this question, and the third one is complete and correct. It is advisable to completely cross out any unwanted solutions in case it is unclear which the final solution is. In this case it was felt that the third solution was clearly the intended solution. The inclusion of the ‘time’ axis neatly shows which order the pictures were taken in. The inclusion of the directions from which the pictures were taken was not asked for, and gained no marks.

(c) (i) The appropriate answer (32) is given clearly and unambiguously. A diagram is certainly useful for tackling this question, but gains no marks.

(ii) The candidate was awarded one mark out of two, for the answer 34. This answer appreciated the fact that four of the columns could be ‘empty’, but did not see that a single ‘4’ in the middle of the bottom row would have coped with both 4s seen. The diagram allowed for this mistake to be seen and credited, although the foreseen popularity of this misapprehension ensured that the answer alone would have gained the marks in this case.

Mark awarded = 9 out of 10
Example candidate response – grade C

Paper 3 – Problem Analysis and Solution
Examiner comment – grade C

(a) (i) The candidate has not initially appreciated the fact that the taller columns can be seen behind the smaller columns. This is clear from the accompanying diagram. The candidate appears to overcome this misunderstanding later in the question, but does not go back to correct the answer to this part.

(ii) The single correct numerical answer, underlined, gains the mark here. The diagram is useful for the candidate, and could gain marks if a minor mistake is made – and so encouraged.

(b) (i) The candidate’s answer fails to appreciate the visibility of the bottom left hand column: the ruins shown would in fact appear as ‘6+4’ from any direction. There are no marks available for solutions with errors such as this here.

(ii) The candidate gains full marks for a clear statement of the order of the pictures (B-A-C underlined). A brief statement of what the solution represents is encouraged in questions requiring more than one piece of information, to avoid ambiguity: ‘the order of the pictures must be B then A then C’, for instance.

(c) (i) The candidate does not recognise the need to fill the remaining spaces with pillars that do not interfere with the profiles given in the question, and scores no marks.

(ii) The candidate scores one mark for the suboptimal solution, in which the remaining spaces are filled with blocks of the smallest size allowable – although the intention was to allow columns of zero height, columns of height 1 were deemed permissible.

Mark awarded = 6 out of 10
Example candidate response – grade E

1a i) $21 = 5 \times 6 + 4 = 21$
ii) $15 = 5 \times 6 + 4 = 15$

1b i) $2 \quad 6$
ii) $C = 5 \quad 5$
   $B = 6 \quad 6$
   $A = 6 \quad 6^\checkmark$

1c i) $44 = 4 + 2 + 5 + 6 + 6 + 6 + 6$
ii) $34 = 4 + 2 + 5 + 4 + 5 = 20$

666
9 × 6 = 54

666
54 - 20 = 34
Examiner comment – grade E

(a) (i) The candidate has not realised that the final column must be below 4 in order to leave the profile unaltered. No marks awarded here.

(ii) The insight into how the columns behind interfere with the profile is not needed for this question, and so the candidate manages a correct solution and is awarded full marks.

(b) (i) The candidate's diagram satisfies the requirements and is awarded full marks.

(ii) The candidate offers a clearly ordered collection of diagrams, which are internally consistent (in that it is possible to get from their C to their B to their A by removing blocks) but do not satisfy the requirements of the profiles offered. As a result they are awarded one mark, for the consistency alone.

(c) (i) The recurring misconception about how the profiles reflect the highest of any columns in a given row yields an inappropriate conclusion and no marks are awarded here.

(ii) The candidate achieves a maximum here, by reducing four columns to a minimum (0). This is only awarded one mark since it fails to appreciate the special case in which both 4s are catered for by one column.

Mark awarded = 4 out of 10
Question 2

2 Study the information below and answer the questions. Show your working.

The driving licences issued in Great Britain up until 1 April 1999 did not have a photograph, but there were features to help the police to check if a licence they were shown was likely to be a valid licence for a particular driver.

Jeremy noticed that the six-digit number (shown in bold) on his driving licence might be somehow associated with his date of birth: SMITH 704309 J99RX. He was born on 30 April 1979.

Iain’s number is 806210, and he was born on 21 June 1980. Between them they thought they understood how the digits were selected and arranged, and correctly predicted Fred’s six-digit number, knowing that he was born on 17 March 1981.

(a) (i) What was Fred’s number? [1]

(ii) Although they could make this prediction knowing the numbers and dates of birth of both Iain and Jeremy, they could not be sure how the numbers were constructed by just looking at the number and date of birth of only one of them. Why not? [1]

(iii) Give an example of a date of birth which would have been sufficient on its own to make this prediction with confidence. [1]

Emma pointed out that it must be a more complicated system than Jeremy thought, as her number is 662126, and her (female) friend Jocelyn has 752232.

Jeremy, knowing that Emma’s birthday is 12 December, correctly suggested that this is because a specific number was added to one of the digits for females.

(b) (i) How much is added, and to which digit? [2]

(ii) What is Jocelyn’s date of birth? [1]

(c) Although never implemented, the authorities considered identifying people who had been born outside Great Britain by using a similar system to that which identifies gender.

Give an example of how this could have been done, within the six digits, without losing any of the existing information. [1]

(d) Sometimes people tried to use the driving licence of one of their parents.

Given that a police officer can estimate a person’s age to within ten years, what is the chance that the deception would be noticed from looking at the person and the number on the driving licence? [1]

(e) Using a random number for making a fake licence for a male, what is the probability that it would fail to give a valid month and date (ignoring the year)? [2]
Mark scheme

2  (a)  (i) What was Fred’s number?  

The last two digits of the year are split – into first and last (sixth) position, with the month in 2nd and 3rd and the day in 4th and 5th.

17 March 1981 – 170381 would appear as 803171

(ii) Although they could make this prediction knowing the numbers and dates of birth of both Iain and Jeremy, they could not be sure how the numbers were constructed by just looking at the number and date of birth of only one of them. Why not?  

Each had two zeros, so couldn’t be sure which one was moved to which position – although might make a reasonable guess. (Because the repeats are in different places for the two people, the cases can be distinguished.) Repeated digit.

(iii) Give an example of a date of birth which would have been sufficient on its own to make this prediction with confidence.  

Any date where all the six digits are distinct is necessary and sufficient. e.g. 23 Jan ’45 or 17 March ’82. Condone 11 November 2011 (or 1911, 1811, …) as a special case which would allow the particular birth date to be predicted, but no general pattern.

(b)  (i) How much is added, and to which digit?  

662126 would give a month 62, and 752232 month 52, so it must be 5 added to the tens of the month/the second digit of the six. 
Award 1 mark for appreciating that the second digit is affected. Dependent on achieving the first mark, award 1 mark for “5” added.

(ii) What is Jocelyn’s date of birth?  

752232 would be (a female) born on 23 February 1972.

(c) Give an example of how this could have been done, within the six digits, without losing any of the existing information.  

Add 4, 5 or 6 to the fourth digit OR add 2 or 3 to the second digit. (or 7 or 8 mod 10.) Other possible methods for distinguishing foreign-born citizens include “+31 to the date” (or any other number up to and including 69), “to the second digit: +3 for male foreign-born, +5 for female UK-born, +8 for female foreign-born”.

[1 mark for any valid example]
(d) Given that a police officer can estimate a person’s age to within ten years, what is the chance that the deception would be noticed from looking at the person and the number on the driving licence? [1]

As parents are at least 10 years older, the deception is certain to be noticed. Award 1 mark for any clear indication of certain recognition by the police officer. OR award 1 mark for an estimate of high probability (or alternatively, low probability of the deception succeeding) combined with a viable explanation of the high likelihood: likely to appeal to the 10+ year gap which (almost definitely) exists between parent and child.

(e) Using a random number for making a fake licence for a male, what is the probability that it would fail to give a valid month and date (ignoring the year)? [2]

10,000 possible numbers, of which only 366/365 are valid. So \(\frac{10,000 - 366}{10,000} = 96.34\%\) or 96.35\% o.e.

If 2 marks cannot be awarded, award 1 mark for EITHER using 9999 instead of 10,000 OR estimating the probability of specifying a valid date as 12/100 \(\times\) 31/100 (giving a final answer of 96.28\%) or 12/100 \(\times\) 30/100 (giving 96.4\%) OR using 99 instead of 100 in the method referred to above (giving 96.20\%) AND/OR solutions giving the probability of succeeding, rather than failing (not subtracting from 1).
Example candidate response – grade A

Question Number 2

a i) 8 0 3 1 7 1

ii) This is because it could just have been a coincidence.

Because there are numbers which repeat themselves in both of their drivers’ licences (e.g. Jeremy’s has two 0’s).

iii) 26th May 1987

b i) 5 is added to the 2nd digit

7 5 2 3 2

ii) 7 5 2 3 2

25th February 1972

Add 4 to the 4th digit if born outside of Great Britain.

c High, as biologically a person must be well over the age of ten before they are able to give birth, or fertilize a woman to give birth.
Examiner comment – grade A

(a) (i) There was only one feasible answer here, which the candidate clearly identifies. One mark.

(ii) The candidate clearly shows that it is the repeated zeros which leave the individual numbers ambiguous. The example (in brackets) makes this clear, and such illustrations are encouraged if an explanation is asked for.

(iii) The candidate offers two versions of a correct date (26 05 87). Only one would have been needed to gain the mark.

(b) (i) The candidate clearly identifies how much and to which digit – and gains two marks. Any clear identification of which digit was involved gained the mark.

(ii) Only one date was permissible here, and the candidate clearly identified it. The candidate’s habit of underlining the final answer would certainly be encouraged.

(c) Adding 4 to the fourth digit is one possible solution, and gets the mark.

(d) The candidate offered a brief and appropriate explanation for the ‘high’ chance they assigned, and gained the mark.

(e) The candidate attempted the question using an inappropriate combinational strategy and failed to achieve a correct answer as a result. No marks awarded.

Mark awarded = 8 out of 10
Example candidate response – grade C

1 (a) (i) 803171
   (ii) It could have been a coincidence so they would need at least two for verification.
   (iii) 812241

2 (i) 5 is added to the second digit.
   (ii) 23 February 1972
   (iii) Authorities could have added 5 to the fourth digit.

b) It is a very high chance that a police officer would be able to notice someone using their parents' license as the year of birth is given on their six-digit number and children will be more than ten years younger than their parents.

Examiner comment – grade C

(a) (i) A correct answer gaining the one mark available.
   (ii) A number of candidates offered a solution similar to this, appealing to the need for two results to confirm the prediction; this failed to appreciate that the question asserted that they could be logically sure of the predicted construction when both numbers were available. As a result, such answers scored no marks.
   (iii) The candidate offered an answer with two repeated digits (1s and 2s) and thus failed to win the mark available.

(b) (i) A clear identification of how much and to which digit. Two marks awarded.
   (ii) Only one date was permissible here, and the candidate clearly identified it. One mark.
(c) Adding five to the fourth digits fits the requirements and merits one mark.

(d) The candidate is awarded the mark here for their explanation of the likelihood they offer (“children will be more than ten years younger than their parents”).

(e) The candidate attempts the question by dividing the digits up and considering what restrictions apply to each; this is not the efficient way to tackle the question, and is not completed correctly. No marks awarded.

Mark awarded = 6 out of 10

Example candidate response – grade D
Examiner comment – grade D

(a) (i) A correct answer gaining the one mark available.

(ii) The minimum answer required to gain the mark here.

(iii) A correct collection of numbers, in which there are no repeats (12/03/87); one mark.

(b) (i) A clear identification of how much and to which digit; two marks awarded.

(ii) The candidate does not offer the full answer (omitting the year) and gains no marks.

(c) Subtracting seven from the last digit would clearly interfere with the years of birth, and so does not fit the requirements. No marks awarded.

(d) There is no attempt to offer a likelihood (such as ‘certain’) and the explanation that the candidate offers appears to miss the point that ages can be identified to within ten years: “a 30-year-old could use his/her 48-year-old mother/father’s car”. Even without this mistake, the examples are too anecdotal and unfocused to constitute an explanation. No marks awarded.

(e) The candidate attempts to list the restrictions that exist on the individual digits, which does reflect the efficient method to find a solution here. Furthermore, the candidate does not attempt to gather their comments into anything constituting a numerical solution, which would be expected when a probability is asked for. No marks awarded.

Mark awarded = 5 out of 10
Question 3

3 Study the information below and answer the questions. Show your working.

Large blocks of stone can be moved by ‘rolling’ them. The diagram below shows how a single stone can be moved in this way.

![Diagram of stone rolling]

It is quicker to lower a tall stone than to raise it. From experience, a stonemason knows that he can turn a stone through 90° in \((b/h)\) minutes, where \(b\) is the length of the face that is flat on the ground, and \(h\) is the vertical height of the stone as he is about to turn it.

For example, a block that has two of its dimensions as 5 metres and 2 metres can be turned 180° in \(5/2\) minutes + \(2/5\) minutes = 2 minutes 54 seconds.

The stonemason wishes to move large blocks of stone, in order to then cut them into manageable pieces for tombstones. He is considering how to move them most quickly.

In order to move a block, he chooses the initial orientation, and then rolls it in the same direction for the whole journey.

He will only consider blocks that are cuboid in shape and have dimensions that are whole numbers of metres.

(a) Consider a block with dimensions 2 m x 2 m x 6 m. Calculate the minimum possible time that it would take to roll the block through 360°. [1]

(b) Consider a block with dimensions 1 m x 4 m x 6 m. Calculate all the different possible distances that the block could travel in one 360° revolution, according to the different initial orientations. [1]

(c) If a 24 m³ block is to travel at least 610 m, what is the smallest possible number of 90° turns that will be needed? [3]

(d) What dimensions for a 24 m³ block will allow for the smallest possible time to move it 610 m? State the time it will take, to the nearest minute. [4]
He decides that he needs $61 \text{ m}^3$ of stone for the next season. He can only move a maximum of $24 \text{ m}^3$ at a time. It takes 5 minutes for him to return the $610 \text{ m}$ distance without a stone.

(e) Show that it is possible for him to move exactly $61 \text{ m}^3$ of stone in less than 500 minutes. [4]

(f) He realises that by transporting more than $61 \text{ m}^3$ of stone in total, he can reduce the overall amount of time. However, he does not want to move any more than $70 \text{ m}^3$ or there will be too much waste.

What set of block sizes should he move to minimise his total time? [2]

Mark scheme

3  (a) Consider a block with dimensions $2\text{ m} \times 2\text{ m} \times 6\text{ m}$. Calculate the minimum possible time that it would take to roll the block through $360^\circ$. [1]

Two orientations are possible.
- Along a $2 \times 2$ face: time $= 1 + 1 + 1 + 1 = 4 \text{ minutes}$
- Along a $6 \times 2$ face: time $= 3 + 1/3 + 3 + 1/3 = 6 \text{ minutes} \ 40 \text{ seconds}$
So 4 minutes the minimum possible time.

(b) Consider a block with dimensions $1\text{ m} \times 4\text{ m} \times 6\text{ m}$. Calculate all the different possible distances that the block could travel in one $360^\circ$ revolution, according to the different initial orientations. [1]

Three orientations are possible.
- Along the $1 \times 4$ face: distance $= 1 + 4 + 1 + 4 = 10 \text{ metres}$
- Along the $1 \times 6$ face: distance $= 1 + 6 + 1 + 6 = 14 \text{ metres}$
- Along the $6 \times 4$ face: distance $= 6 + 4 + 6 + 4 = 20 \text{ metres}$
Award no marks if extra distances are given.
(c) If a $24 \text{m}^3$ block is to travel at least $610 \text{m}$, what is the smallest possible number of $90^\circ$ turns that will be needed?

The face with the largest perimeter is needed to minimise the number of turns. For integer solutions, this can be seen to be the $24 \times 1$ face, whose perimeter is 50 metres. $610/50 = 12$ revolutions with 10 metres remaining. Being able to choose whether the block is standing upright or lying down at the beginning allows us to choose which way it is standing at the end. Clearly, if upright it can pass the 610 finish line with one more $90^\circ$ turn: 49 turns in total.

3 marks for the correct answer [underlined above].
If 3 marks cannot be awarded, award 2 marks if the number of complete revolutions or half revolutions is seen for the $24 \times 1$ case OR if the number of quarter turns for a reasonable alternative orientation is given. ($12 \times 2, 8 \times 3, 6 \times 4, 6 \times 2, 4 \times 3, 3 \times 2, 2 \times 2, 1 \times 1$).
If 2 marks cannot be awarded, award 1 mark if the number of complete revolutions or half revolutions for the one of the suboptimal solutions (given in brackets above) is seen.

(d) What dimensions for a $24 \text{m}^3$ block will allow for the smallest possible time to move it $610 \text{m}$? State the time it will take, to the nearest minute.

The numerical space to explore is shown in the table below.
It can be seen that the face which is fastest to move along is that with dimensions $4 \times 6 \times 1 \text{m}$. This is sufficiently clear-cut to short-circuit any need to consider any peculiarities that might be thrown up by the need for a whole number solution.
Fastest block’s dimensions: $4 \times 6 \times 1 \text{m}$.
Time taken to complete 610 metres:
$610/(6+4+6+4) = 30$ complete revolutions, with 10 metres remaining.

Time taken $= (30 \times 4 \frac{1}{3} \text{ minutes}) + 3/2 \text{ minutes} + 2/3 \text{ minutes}$
$= 132 \text{ minutes}$

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4 marks to be awarded if the underlined time is given [choice of block size is implicit].

If 4 marks cannot be awarded, award 3 marks for a suboptimal time less than 300 minutes: see table above for the options [in bold].

If 3 marks cannot be awarded, award 2 marks for a suboptimal time more than 300 minutes: see table above for the options [not in bold].

If 2 marks cannot be awarded, award 1 mark for a solution showing a method in which the speed for one revolution (shown in the fourth column in the table) is multiplied by the number of revolutions (shown in the fifth column), allowing for numerical errors.

(e) Show that it is possible for him to move exactly 61 m$^3$ of stone in less than 500 minutes. [4]

There are two ways to achieve a time under 500 minutes:

- $20 + 20 + 21 = (139 \text{ mins } 24 \text{ secs}) + 5 \text{ mins} + (139 \text{ mins } 24 \text{ secs}) + 5 \text{ mins} + (168 \text{ mins } 29 \text{ secs}) = 457 \text{ mins } 17 \text{ secs}$
- $21 + 24 + 16 = (168 \text{ mins } 29 \text{ secs}) + 5 \text{ mins} + (132 \text{ mins } 10 \text{ secs}) + 5 \text{ mins} + (153 \text{ mins}) = 463 \text{ mins } 39 \text{ secs}$

4 marks for either of the above solutions, with rounding condoned [e.g. $168 + 5 + 132 + 5 + 153 = 463 \text{ mins}$].

If 4 marks cannot be awarded, 3 marks for any correctly calculated answers which add up to 61 m$^3$ [allowing for rounding]. Allow for rounding errors mid-calculation [i.e. make no deductions] throughout this question, provided it is supported by clear working.

For instance:
- $24 + 24 + 13 = (132 \text{ mins } 10 \text{ secs}) + 5 \text{ mins} + (132 \text{ mins } 10 \text{ secs}) + 5 + (562 \text{ mins } 23 \text{ secs}) = 836 \text{ mins } 43 \text{ secs}$
- $22 + 21 + 18 = (267 \text{ mins } 3 \text{ secs}) + 5 \text{ mins} + (168 \text{ mins } 29 \text{ secs}) + 5 \text{ mins} + (170 \text{ mins}) = 615 \text{ mins } 32 \text{ secs}$
- $15 + 15 + 15 + 16 = (172 \text{ mins } 52 \text{ secs}) + 5 \text{ mins} + (172 \text{ mins } 52 \text{ secs}) + 5 \text{ mins} + (172 \text{ mins } 52 \text{ secs}) + 5 \text{ mins} + (153 \text{ mins}) = 606 \text{ mins } 36 \text{ secs}$
- $24 + 22 + 15 = (132 \text{ mins } 10 \text{ secs}) + 5 \text{ mins} + (267 \text{ mins } 3 \text{ secs}) + 5 \text{ mins} + (172 \text{ mins } 52 \text{ secs}) = 582 \text{ mins } 5 \text{ secs}$

If 3 marks cannot be awarded, award 1 mark for a choice of block sizes (each less than 24 m$^3$) which add up to 61 m$^3$, AND 1 mark for a calculation of the time taken to move a block 610 m, so long as the calculation has not been credited in (d).
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(f) What set of block sizes should he move to minimise his total time? [2]

The quickest way of transporting between 61 and 70 m³ of stone is to move two 24 m³ blocks and one 20 m³ block:

\[
24 + 24 + 20 = (132 \text{ mins 10 secs}) + 5 \text{ mins} + (132 \text{ mins 10 secs}) + 5 \text{ mins} + (139 \text{ mins 24 secs}) = 413 \text{ mins 44 secs}.
\]

2 marks for identifying the correct combination of blocks: 24 + 24 + 20.

If 2 marks cannot be awarded, award 1 mark for 24 + 20 + 20 or 24 + 24 + 16.
### Example candidate response – grade A

3. a) \[ \frac{2}{2} + \frac{2}{2} + \frac{2}{2} = 4 \text{ min. (MINIMUM)} \]
\[ \frac{2}{2} + \frac{5}{2} + \frac{5}{2} = 5 \text{ min. (MAXIMUM)} \]

b) I. \( b = 1 \), \( h = 4 \), \( ST = 10 \text{ m} \)
II. \( b = 4 \), \( h = 6 \), \( ST = 20 \text{ m} \) (MAXIMUM)
III. \( b = 1 \), \( h = 6 \), \( ST = 14 \text{ m} \)
IV. \( b = 4 \), \( h = 1 \), \( ST = 10 \text{ m} \)
V. \( b = 6 \), \( h = 4 \), \( ST = 20 \text{ m} \) (MAXIMUM)

\[ c) I. 3 \text{ m} \times 4 \text{ m} \times 2 \text{ m} \]

\[ \begin{align*}
A & : b = 3, h = 4, ST = 610 \text{ m} \\
& 90^\circ t = 17.5 \\
B & : b = 2, h = 3, ST = 610 \text{ m} \\
& 90^\circ t > 17.5 \\
C & : b = 2, h = 4, ST = 610 \text{ m} \\
& 90^\circ t > 17.5 \\
\end{align*} \]

II. \( 1 \text{ m} \times 6 \text{ m} \times 4 \text{ m} \)

\[ \begin{align*}
b & = 6, h = 4, 90^\circ t = 122 \\
\end{align*} \]

III. \( 1 \text{ m} \times 8 \text{ m} \times 3 \text{ m} \)

\[ \begin{align*}
b & = 8, h = 3, 90^\circ t = 111 \text{ turns} \\
\end{align*} \]

IV. \( 1 \text{ m} \times 1 \text{ m} \times 24 \text{ m} \)

\[ b = 24, h = 1, 90^\circ t = 49 \text{ MINIMUM} \]
\[d)\] \(8m \times 4m \times 2m\)

\[A. \quad b = 3 \quad h = 4\]
\[t = \left(\frac{3 + 3}{3} \times \frac{1}{4}\right) \times 8 = \frac{6}{4} \times 8 = 12 \text{ min}\]

\[B. \quad b = 3 \quad h = 2\]
\[t = \left(\frac{3 + 2}{2}\right) \times 8 = \frac{5}{2} \times 8 = 20 \text{ min}\]

\[C. \quad b = 2 \quad h = 4\]
\[t = \left(\frac{2 + 2}{2}\right) \times \frac{1}{4} = 2 \times \frac{1}{4} = 0.5 \text{ min}\]

\[\text{II} \quad 1m \times 1m \times 24m\]
\[b = 1 \quad h = 24\]
\[t = \left(\frac{1 + 24}{1}\right) \times \frac{1}{2} = 25 \times \frac{1}{2} = 12.5 \text{ min}\]

\[\text{III} \quad 1m \times 6m \times 4m\]
\[b = 6 \quad h = 4\]
\[t = \left(\frac{6 + 4}{4}\right) \times \frac{1}{6} = \frac{10}{4} \times \frac{1}{6} = 1.5 \text{ min}\]

\[\text{IV} \quad 1m \times 8m \times 3m\]
\[b = 8 \quad h = 3\]
\[t = \left(\frac{8 + 1}{3}\right) \times \frac{1}{8} = \frac{9}{3} \times \frac{1}{8} = 0.375 \text{ min}\]

\[\text{V} \quad 1m \times 2m \times 12m\]
\[b = 2 \quad h = 12\]
\[t = \left(\frac{2 + 12}{12}\right) \times \frac{1}{2} = \frac{14}{12} \times \frac{1}{2} = 0.33 \text{ min}\]
Examiner comment – grade A

(a) The candidate identifies the correct minimum time (four minutes) with an appropriate calculation and is awarded the mark, although the alternative example is incorrect. The mistake appears to derive from a misreading of the question.

(b) The candidate lists all three possible distances, by considering all six possible orientations. The approach is not obviously systematic, but it is clearly laid out, and this is the key to such a question.

(c) The candidate tackles the question with a clearly laid-out collection of cases, and correctly identifies the correct orientation and the number of turns it would take (49). For this they are awarded full marks. This clarity of approach is to be encouraged; it can be seen that the candidate would have scored two marks even if they had not found the optimal solution, because their working covered the ‘suboptimal’ cases.

(d) As in question (c), the candidate tackles this search with clarity and organisation. This would have gained partial marks even if the correct answer was not identified, and enabled a clear decision of when to stop searching. A clear, underlined minimum was identified. Full marks awarded.

(e) This question required careful calculation and a structured answer, which the candidate managed to deliver. Once again the separable numbered attempts at a solution would have allowed the candidate to gain partial marks, and appeared to allow the candidate to reflect upon what was likely to yield a satisfactory solution. Full marks awarded.

(f) The candidate has selected one of the suboptimal answers (24+24+16), and gains one mark. No marks were available for the times offered, since they were not asked for in the question.

Mark awarded = 14 out of 15
Example candidate response – grade C

Question Number 3

(a)

\[ \frac{\pi}{2} + \frac{\pi}{2} + \frac{\pi}{2} + \frac{\pi}{2} \]

= \frac{4}{\pi} \text{ minutes}

(b) According to diagram

Up or down = 14 m

Left or right = 10 m

Left:

11 + 1 + 1

= 13 m

Right:

1 + 4 + 1 + 1

= 7 m

Up:

1 + 6 + 1 + 1 + 1

= 10 m

Down:

1 + 6 + 1 + 1

= 14 m
\[ 24 = 3 \times 2 \times 2 \times 2 \]

\[ V = 24 \text{ m}^3 \]

\[ \text{c. } 180^\circ = 10 \text{ m} \]

\[ 40^\circ = \cdots \frac{610}{10} = 61 \text{ } 180^\circ \text{ turns} \]

\[ \vdash 122 \text{ } 90^\circ \text{ turns} \]

\[ \begin{align*}
180^\circ & = 2 \text{ min} \\
180^\circ & = 2 \text{ min} \\
= 2 \text{ m} & = 4 \text{ m} \\
1 \text{ m/min} & 2 \text{ m/min} \\
\vdash 1 \text{ m/min} & \text{ 2 m/min} \\
\vdash 4 \text{ m/min} & \text{ 4 m/min} \\
\end{align*} \]

\[ \begin{align*}
\text{e. } & \text{ A } 4 \text{m} \times 6 \text{m} \times 6 \text{m} \text{ block will} \\
\text{take the shortest time} & \\
180^\circ & = 2.17 \text{ min} \\
= 10 \text{ m} & = \frac{610}{4.62 \text{ m/min}} \cdots \\
4.62 \text{ m/min} & = \frac{610}{132 \text{ minutes}} \\
\end{align*} \]
Paper 3 – Problem Analysis and Solution

\[
\begin{align*}
&\text{132.1 min.} = 152.05 \text{ min} \\
&\text{4 m/min} \\
&\text{267.2 min.} = 267.5 \text{ min} \\
&\text{3.62 m/min} \\
&\text{168.51 min.} \\
\end{align*}
\]

\[
\begin{align*}
&\text{130°} = 13 \times 8.8 \text{ min} \\
&\text{= 114 min} \\
&\text{= 168.51 min/min} \\
\end{align*}
\]

\[
\begin{align*}
&\text{4 \times 6 \times 1 \ block} \\
&\text{180°} = 10 \text{ m} \\
&\text{= 4 \times 6 \times \frac{1}{4} = 6 \text{ min}} \\
&\text{= 261.7 \text{ min}} \\
&\text{610 m = 132.01 min} \\
\end{align*}
\]

\[
\begin{align*}
&\text{4 \times 4 \times 1 \ block} \\
&\text{180°} = \text{area of block} \\
&\text{= 4 \times \frac{4}{4} = 2 \text{ min}} \\
&\text{610 m = 152.5 \text{ min}} \\
\end{align*}
\]

\[
\begin{align*}
&\text{7 \times 3 \times 1 \ block} \\
&\text{180°} = 10 \text{ m} \\
&\text{= 4 \times \frac{3}{4} \times \frac{3}{4} = 26.76 \text{ min}} \\
&\text{610 m = 168.51 \text{ min}} \\
\end{align*}
\]

\[+ 2(5 \text{ min}) = 463.1 \text{ min}\]

Question Number: 3

\[2 \times (4 \times 6 \times 1 \text{ m}) \]
\[\text{and } 3 \times (4 \times 4 \times 1 \text{ m}) \]

\[269.2 \text{ min} + 152.5 \text{ min}\]
Examiner comment – grade C

(a) The candidate’s diagram clearly helped them to identify the correct orientation here, and one mark was awarded for the correct solution.

(b) Unfortunately, the candidate’s diagram restricted their consideration of all orientations, and they did not find all three of the distances required. No partial marks were available, and so no marks were awarded.

(c) The candidate considers one orientation, and correctly calculates the number of turns. This is one of the suboptimal answers, and is awarded one mark.

(d) The candidate identifies an efficient way of sorting the variety of possible dimensions (block speed in metres/min) and uses this to identify the quickest. They then calculate the correct time, and round it, and are awarded full marks as a result.

(e) The candidate uses diagrams to identify an appropriate collection of blocks and correctly finds the time taken. Full marks awarded. The careful layout of their solution would have allowed the candidate to gain partial marks if any mistakes had been made.

(f) The candidate has selected one of the suboptimal answers and gains one mark.

Mark awarded = 11 out of 15
Example candidate response – grade E

3) a) \[
\frac{2}{3} \text{ min} \times 4 = 4 \text{ min}
\]

b) \[
\begin{align*}
1 + 1 + 4 \times 4 &= 10 \text{ m} \\
1 + 1 + 6 \times 6 &= 14 \text{ m} \\
4 \times 4 + 6 \times 6 &= 20 \text{ m}
\end{align*}
\]

c) \[24\]

- Dimension of cube are \(24 \times 1 \times 1\)

- \[
\frac{24 + 1}{2} = 12.5 \text{ \(\times\) required}
\]

d) \[
\begin{align*}
\text{Dimension: } &24 \sqrt[3]{24} \times 1 \\
\text{Side: } &24 \sqrt[3]{24}
\end{align*}
\]

- \[60 : 24 \sqrt[3]{24} \approx 12.5 \text{ \(\times\) required 90° required}
\]

- \[= 125 \text{ mm}\]
Examiner comment – grade E

(a) The candidate’s diagram clearly helped them to identify the correct orientation here, and one mark was awarded for the correct solution.

(b) The candidate identifies the three possible orientations and is awarded a mark.

(c) The candidate gives the correct solution and is awarded the full marks, although the working is unclear. Some questions require a correctly demonstrated method (as is required in the initial instructions, for candidates to show their working), but it was decided that a correct final answer was sufficient in this question.

(d) The candidate appears to be considering dimensions that are not whole numbers, and is not able to access any of the marks as a result. This requirement was deemed to be necessary for a solution to merit any marks at all.

(e) The mark was awarded here for implicit choice of three sizes that added up to 61 (24+24+13 in this case). This shows the need for candidates to show their working, so that their strategic choices can be credited even if their calculations are erroneous.

(f) Again this involves non-integer dimensions, and merits no marks.

Mark awarded = 6 out of 15
Question 4

4 Study the information below and answer the questions. Show your working.

Eightskate is a sport in which two teams of eight compete on roller skates.

An eightskate match consists of 12 heats. In each heat, three skaters from each of the two teams are nominated by the respective team managers to race around a 300 m circuit. The skater who crosses the line last at the end of the second lap drops out. This is repeated at the end of the third, fourth and fifth laps – these retiring skaters being ranked fifth, fourth and third respectively. The remaining pair continues for a sixth lap to determine first and second positions.

An eightskate match between Grinnon Bears and Lowan Sharks is currently in progress and is about to reach its climax. The two team managers will shortly nominate their skaters for Heat 12.

This is the score sheet as it stands at present:

<table>
<thead>
<tr>
<th></th>
<th>Grinnon Bears</th>
<th>Lowan Sharks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BEARS</strong></td>
<td><strong>Points Scored</strong></td>
<td><strong>Points Scored</strong></td>
</tr>
<tr>
<td><strong>Heat</strong></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>T. Black</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>O. Brown</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>L. Grizzly</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>E. Honey</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>R. Kodiak</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>A. Malay</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>T. Polar</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>E. Ursa</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td><strong>Team</strong></td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td><strong>SHARKS</strong></td>
<td><strong>Points Scored</strong></td>
<td><strong>Points Scored</strong></td>
</tr>
<tr>
<td><strong>Heat</strong></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>S. Angel</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>W. Basking</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>I. Hammer</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>N. Head</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D. Horn</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>L. Nurse</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>E. Tiger</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>R. White</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Team</strong></td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>
Points are awarded as follows:

<table>
<thead>
<tr>
<th>Position</th>
<th>Heats 1 to 11</th>
<th>Heat 12 only</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>5 points</td>
<td>10 points</td>
</tr>
<tr>
<td>Second</td>
<td>4 points</td>
<td>7 points</td>
</tr>
<tr>
<td>Third</td>
<td>3 points</td>
<td>4 points</td>
</tr>
<tr>
<td>Fourth</td>
<td>2 points</td>
<td>2 points</td>
</tr>
<tr>
<td>Fifth</td>
<td>1 point</td>
<td>1 point</td>
</tr>
<tr>
<td>Sixth</td>
<td>0 points</td>
<td>0 points</td>
</tr>
</tbody>
</table>

When nominating the skaters for any heat, a team manager must be careful to comply with the following rules:

- All skaters must be nominated for a minimum of 4 heats.
- No skater may be nominated for two consecutive heats.
- The same three skaters may not all be nominated together a second time.

(a) After which heat did the Sharks first take the overall lead in the match?  

(b) (i) What is the maximum total distance (in metres) that one skater could possibly skate during an eightskate match?  

   (ii) What is the total distance (in metres) that Edward Ursala has skated so far during this match?  

(c) Select a possible line-up of three skaters to compete in Heat 12 for

   (i) the Bears,  
   (ii) the Sharks.  

(d) (i) Assuming that no skater drops out, is it possible for any eightskate match to end in a draw? Explain your answer.  

   (ii) Rupert, a keen Bears fan, fears that his team can only win the match in progress if they secure first position in Heat 12. Is he right? Explain your answer.
Mark scheme

4 (a) After which heat did the Sharks first take the overall lead in the match? [2]

Answer: Heat 7 OR Bears 52 – Sharks 53 [team must be identified in some way]
If 2 marks cannot be awarded, award 1 mark for evidence of correct assessments of the situation after at least two of the heats between Heat 2 and Heat 6 inclusive:
i.e. Heat 2: 17 – 13 or Bears lead / Sharks trail by 4 points.
    Heat 3: 23 – 22 or Bears lead / Sharks trail by 1 point.
    Heat 4: 33 – 27 or Bears lead / Sharks trail by 6 points.
    Heat 5: 39 – 36 or Bears lead / Sharks trail by 3 points.
    Heat 6: 46 – 44 or Bears lead / Sharks trail by 2 points.

(b) (i) What is the maximum total distance (in metres) that one skater could possibly skate during an eightskate match? [2]

Answer: 10 800m (accept: 10.8km)

If 2 marks cannot be awarded, award 1 mark for appreciation that a skater may compete in a maximum of 6 heats, or an answer of 36 laps, or an answer of 1800m.
(ii) What is the total distance (in metres) that Edward Ursæ has skated so far during this match? 

Answer: 5700 m (accept: 5.7 km)

If 2 marks cannot be awarded, award 1 mark for appreciation of at least two of the following:
5 laps (1500 m) in Heat 2.
6 laps (1800 m) in Heat 4.
2 laps (600 m) in Heat 7.
6 laps (1800 m) in Heat 10.

Alternatively, award 1 mark for an answer of 19 laps or 950 m.

(c) Select a possible line-up of three skaters to compete in Heat 12 for

(i) the Bears, 

Answer: Brown, Honey and Polar
or Brown, Kodiak and Polar
or Brown, Polar and Ursæ
or Honey, Polar and Ursæ
or Kodiak, Polar and Ursæ

Polar has only appeared in three heats, so must skate.
Black, Grizzly and Malay cannot appear in consecutive heats.
Honey, Kodiak and Polar appeared together in Heat 3.

If 2 marks cannot be awarded, award 1 mark for any line-up that contains Polar, or a line-up that consists of any three of Brown, Honey, Kodiak and Ursæ (except Brown, Kodiak and Ursæ, who appeared together in Heat 10).

(ii) the Sharks. 

Answer: Angel, Hammer and Head
or Angel, Head and Horn
or Hammer, Head and Horn

Head has only appeared in three heats, so must skate.
Basking, Nurse and White cannot appear in consecutive heats.
Angel, Head and Tiger appeared together in Heat 7.
Head, Horn and Tiger appeared together in Heat 10.
Hammer, Head and Tiger appeared together in Heat 4.

If 2 marks cannot be awarded, award 1 mark for any line-up that contains Head, or a line-up that consists of any three of Angel, Hammer, Horn and Tiger.
(d) (i) Assuming that no skater drops out, is it possible for any eightskate match to end in a draw? Explain your answer. [2]

Answer: It is not possible because:
- total points in a match is an odd number.
- Deduct 1 mark if the odd number given is incorrect (not equal to 189).
- Deduct 1 mark if the justification is given, but no clear conclusion.
- If 2 marks cannot be awarded, award 1 mark if the candidate explains the impossibility of a draw by referring to a particular game (such as the one given in the question, or one in which a draw is attained after 10 matches).

(ii) Rupert, a keen Bears fan, fears that his team can only win the match in progress if they secure first position in Heat 12. Is he right? Explain your answer. [3]

Answer: No, he is not right. Award 1 mark for reference to EITHER the current score is 82 – 83 / the Bears are 1 point behind OR they need 13 points to win the match / 2 more than the Sharks OR the final score is 95 – 94 / the Bears are 1 point ahead.

Award 2 marks for evidence that this can be achieved with 2nd, 3rd and 4th positions (7 + 4 + 2 points).

A correct conclusion must be seen for the candidate to be awarded 3 marks.
Example candidate response – grade A

4. a) Heat Z

b) i) Maximum number of heats = 6

In a winning race, a player completes 6 laps

\[ 6 \times 300 = 1800 \]

\[ 1800 \times 6 = 10800 \text{ meters} \]

C) i) T. Polar, E. Honey, O. Brown

ii) N. Head, D. Horn, S. Angel

d) i) Yes. Because there are an even number of heats. If one team concedes 6th, 5th, 4th for 6 heats and the 1st, 2nd, 3rd for the other 6 heats, the other team will do the same and they will have the same scores.
Examiner comment – grade A

(a) The correct answer was given and was awarded two marks.

(b) (i) The correct answer (with units) was given, and was awarded two marks.

(ii) Clearly laid out working leads to the correct answer, and is awarded two marks.

(c) The candidate gives one of the five possible combinations, and is awarded two marks.

(ii) The candidate gives one of the three possible combinations, and is awarded two marks.

(d) (i) The candidate concludes wrongly that it is possible, failing to see that the different scoring in the last heat prevents such an outcome, exemplifying the need for careful consideration of all the information offered.

(ii) The candidate offers a correct conclusion and justification: offering the scores after Heat 11, and the solution which will secure the Bears a win. The positions required and the final score are given: an exemplary solution.

Mark awarded = 13 out of 15
Example candidate response – grade C

1. A heat / match
   2. team
   3 sk 3 sk
   start dropping 0 2 laps

a) Heat #2

b) If they won every match + competed every other match =

10800 m

ii) 300 x 4 1800
    + 300 x 2 1200
    + 300 x 2 1200
    + 300 + 6 1800

5400 m
Examiner comment – grade C

(a) The candidate fails to appreciate that it is the cumulative scores which decide who is in the lead, not the scores in an individual heat. No marks awarded.

(b) (i) The correct answer (with units) was given, and was awarded two marks.

(ii) The candidate appreciates the number of laps in three of the heats that the skater competes in, but misjudges Heat 2. This near-correct solution merits one mark.

(c) (i) The candidate gives one of the five possible combinations, and is awarded two marks.

(ii) The candidate gives one of the three possible combinations, and is awarded two marks.

(d) (i) The candidate offers no solution and so cannot score. It is recommended that candidates do not delete their answer unless they have something better to replace it with, since working contained therein may gain them marks.
(iii) The candidate offers a correct solution, with a partial justification, and is awarded two marks as a result. It is necessary for candidates to calculate the score at the end of Heat 11 to make a judgement here, and evidence of such was deemed necessary in the solution. When a question demands an explanation, all relevant working should be shown, in order to ensure full marks are achieved.

Mark awarded = 9 out of 15

Example candidate response – grade E

Examiner comment – grade E

(a) The correct answer was given and was awarded two marks.
(b) (i) The candidate fails to appreciate the restrictions on how many heats a competitor can take part in. No marks awarded.

(ii) The candidate correctly calculates the distance covered by Ursa, and scores two marks.

(c) (i) The candidate fails to appreciate that Polar has only skated in three heats, and omits him from the line-up. The other skaters given are all legitimate, and the candidate scores one mark as a result.

(ii) The candidate’s answer violates a number of the restrictions (Basking and Nurse have competed in Heat 11, and Head must skate) and scores no marks.

(d) (i) The candidate concludes wrongly that it is possible, failing to see that the different scoring in the last heat prevents such an outcome, exemplifying the need for careful consideration of all the information offered.

(ii) The candidate’s attempt fails to offer a correct appreciation of the score after Heat 11, or a correct conclusion, and does not gain any marks.

Mark awarded = 5 out of 15
Question 1

Study the article below and answer the questions that follow.

Global poverty is finally on the decline. This represents good news for all the activists around the world who have campaigned long and hard for an improvement in the quality of life of the world’s poorest people. The reduction in poverty has been confirmed by two recent studies. A statistic from the World Bank shows that the number of people who live below the poverty line decreased from 1.5 billion in 1981 to 1.1 billion in 2001. This measure uses the World Bank’s definition of the poverty line: living on less money per day than the value of $1 in the USA in 1993. The World Bank is the only international body with the capacity to conduct the household surveys necessary to provide this data, across an appropriate sample of the world population.

This statistic is supported by evidence of diminishing global income inequality.

<table>
<thead>
<tr>
<th>World Population</th>
<th>Percentage of World Income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003</td>
</tr>
<tr>
<td>Richest 20%</td>
<td>82.7</td>
</tr>
<tr>
<td>Second 20%</td>
<td>11.7</td>
</tr>
<tr>
<td>Third 20%</td>
<td>2.3</td>
</tr>
<tr>
<td>Fourth 20%</td>
<td>1.9</td>
</tr>
<tr>
<td>Poorest 20%</td>
<td>1.4</td>
</tr>
</tbody>
</table>

The evidence in this table clearly leads us to a heartening conclusion: the rich are getting poorer, and the poor are getting richer!

(a) Identify three points that weaken the credibility of the statistics in the article. [3]

(b) “Global poverty is finally on the decline.”

Do you think the evidence presented is sufficient for this inference to be drawn? Briefly justify your answer. [2]
Mark scheme

1 (a) Identify three points that weaken the credibility of the statistics in the article. [3]

1 mark for each distinct, clearly expressed and relevant comment: e.g.

- Arbitrary definition of poverty.
- Criticism of data collection method (may be unrepresentative or biased).
- No source for the statistics in the table.
- No other study to corroborate the World Bank’s statistics.
- The two years in the article may have been selected to show the desired trend (especially since they are not very recent).
- Poverty is an absolute measure but increased proportion of world income is relative.
- Details of the distribution within the quintiles are not shown.
- Details of changes close to the poverty line are not shown.
- Table provides limited information; does not give any information about actual income, or mean and standard deviation of income across the quintiles.

(b) “Global poverty is finally on the decline.”

Do you think the evidence presented is sufficient for this inference to be drawn? Briefly justify your answer. [2]

1 mark for weak response comprising judgment and minimal explanation. 2 marks for judgment plus a well-developed response.

Some points listed in (a) above may be validly applied in an answer to (b). No credit for repeating or restating points from (a) in (b), but credit may be awarded if a point identified in part (a) is elaborated with fresh critical insight or different application to support whether the inference can or cannot be drawn.

Examples of relevant points:

- 2003/2004 is not very ‘recent’.
- 2001 data is not very relevant.
- Poverty includes other elements: access to water, health, civil liberties etc.
- Income inequality is not identical to poverty.
- Insufficient data to discern a trend (“decline”).

Sample answer: Neither of the measures given in the article accurately reflects global poverty. The World Bank’s measure ignores access to water, health and civil liberties. The world income chart is not sufficiently detailed, since it does not represent where the ‘poverty line’ is placed amidst the quintiles. Therefore I think there is insufficient evidence to draw the inference that global poverty is on the decline.

General comment

Question 1(a) requires the candidate to find up to three weaknesses in the use of statistics in the given passage. The candidate only has to come up with three correct, distinct and clearly expressed comments to get full marks. They do not need to write up a lengthy evaluation but simply identify the weakness and indicate briefly why it is a weakness.

Question 1(b) has to do with interpretation of statistics and asks for a brief justification of why the given inference cannot be drawn. The response here can be more discursive than the response to 1(a) but should be brief. It need not exceed the length of the sample response in the mark scheme, as the candidate cannot access any more credit for further elaboration, even if relevant and correct.
Example candidate response – grade A

1 a) Three points that weaken the credibility of the statistics in the article are:

The World Bank’s research shows that the number of people who live below the poverty line decreased by 0.4 billion from 1981-2001, however, the decrease is based on the definition of living on less money per day than the value of $1 in the USA in 1993 (the dollar’s value fluctuates, why choose 1993?), the World Bank is the only institution with the capacity to provide such data (and it therefore could be erroneous or biased and no other institutions could conduct independent studies to
compare and validate or
instantiate results), and
the graph shown only
shows income global income
distributions from 2003-2004,
which is a snapshot and
not long enough to prove
any sort of sustained
trend.

b) No. I do not think the
evidence is sufficient enough
for the inference “Global
poverty is finally on the
decline” to be drawn.
The graph’s statistics could
have been made to
look promising due to population
growth; with more poor
people, more of the world’s
total income would be
allocated there rather than
the already existing population.
Examiner comment – grade A

(a) The candidate identifies accurately and precisely three points of weakness i.e. the problem of definition, lack of corroboration from other sources and too limited information to conclude a trend. It is well expressed and unambiguously to the point.

(b) The candidate writes at unnecessary length here. They start with a clear judgement but then make some non-creditworthy speculations, and repeat a point already made in 1(a) (‘snapshots’). However the candidate does provide one fully valid point to justify why the evidence given is insufficient for the inference to be drawn, i.e. the inner likely variations have not been reflected in the data. The candidate would have earned the two marks just as well and saved time by writing concisely.

Mark awarded = 5 out of 5
Example candidate response – grade C

(a) The first two weaknesses the candidate identifies are correct and just sufficiently expressed to earn two marks. The third is too vague or imprecise to get the third mark.

(b) The candidate needed to have identified which statistics (2003/4 or 2001?) and why they would not relate, i.e. they were either not recent or not relevant.

Mark awarded = 3 out of 5
Example candidate response – grade E

One point that weakens the credibility of the statistics is that the poverty line has actually increased. Another point is that the value of a US dollar has weakened. The last point is that data was only collected for the 2003-2004 year, so it is not safe to assume that global poverty is declining.

Examiner comment – grade E

(a) Only one point was correctly identified. The first point (about the poverty line) is a statement of observation and not a precise identification of flaw in the data. The second point (that “the value of a US dollar has weakened”) is accurate and just adequately expressed to earn a mark. The third point is too general, rather than actually pinpointing the precise weakness.

(b) The candidate identifies a valid point, i.e. the lack of “a more current poverty line”, but falls short of justifying how this is insufficient for the inference to be drawn. Instead, the candidate goes on to a different or additional view about the need for a graphical display. The candidate accesses one mark for making the former point, and none for the rest.

Mark awarded = 2 out of 5
Question 2

2 Briefly analyse NU’s argument in Document 1: A Blessing in Disguise, by identifying its main conclusion and reasons, as well as any intermediate conclusions and counter-arguments. [6]

DOCUMENT 1

A Blessing in Disguise

Most people would agree that the invasion and occupation of another country should be condemned. Why? There is this idea of ‘self-determination’ – that the people living in a country should decide their own future and govern themselves. In general, we do not like bullies in our private lives and this feeling carries across to public life too; indeed, our private life gets directly (and negatively) affected by what is happening in our country during an invasion. It is difficult to carry on with your grocery shopping when there is a tank from an enemy driving down the street. The difficulty with this argument is that the long-term benefits of occupation are overlooked because of the short-term injustices of being invaded.

In actual fact, invasion may not be such a bad thing if it leads to an enrichment of culture in the subject countries. Most countries have been invaded several times and this has led to the culture and values of the invading nations being superimposed on the subject nations. The process by which the British occupation of India influenced its culture is a classic example. Some of the greatest Indian thinkers ensured that India took something from its invaders. The Brahma Samaj was founded by Raja Rammohan Roy (1774 – 1833), whom some see as the founder of modern India. This was a movement of modernisation for societies that had not industrialised in the way that the West had done. Raja Rammohan Roy directed his pupils to read the great Western philosopher Voltaire (1694 – 1778), but he also drew on much earlier Islamic and Persian influences as well as the ancient Greek philosopher Aristotle. So we can see that true leaders and intellectuals do not resist the culture of invaders; instead, they think and reflect, so that they can find opportunities to use the incoming culture to enrich the lives and traditions of their own people. This could explain why the so-called British Raj (1858 – 1947) had such a tremendous influence on the India of today.

Knowledge and know-how from the West have greatly contributed to shaping modern India. There would be no Bollywood without Hollywood. Indeed, India would have no film industry if the West had not invented cinema photography. The British Empire passed on to India its own vast industrial and technological acquisitions. In effect, the current industrialisation of India could not have happened without the Industrial Revolution that took place in Britain in the eighteenth and nineteenth centuries. Software development has become one of the greatest business success stories of India in recent years, yet even this would not have happened if the modern computer had not been first invented and then widely adopted by companies in the USA. Of course, these innovations and advances do not come without problems, but that is another matter. What I can assert confidently is that countries which have frequently been invaded should be grateful to their leaders who have recognised and taken advantage of the ideas and inventions of the invaders.

NU
Mark scheme

2 Briefly analyse NU’s argument in Document 1, by identifying its main conclusion and reasons, as well as any intermediate conclusions and counter-arguments. [6]

CA – (Most people would agree that) the invasion and occupation of another country should be condemned.
CA – There is this idea of ‘self-determination’ – that the people living in a country should decide their own future and govern themselves.

R1 – The long-term benefits of occupation are overlooked because of the short-term injustices of being invaded.
IC – In actual fact invasion cannot be such a bad thing if it leads to an enrichment of culture in the subject countries.
R2 – Most countries have been invaded several times and this has led to the culture and values of the invading nations being superimposed on the subject nations.
R3 – Some of the greatest Indian thinkers ensured that India took something from its invaders.
IC – (So we can see that) true leaders and intellectuals do not resist the culture of invaders, instead they use the incoming culture to enrich the lives and traditions of their own people.
IC – Knowledge and know-how from the West have greatly contributed to shaping modern India.
R4 – India would have no film industry if the West has not invented cinema photography.
R5 – The current industrialisation of India could not have happened without the Industrial Revolution that took place in Britain in the eighteenth and nineteenth centuries.
R6 – Software development has become one of the greatest business success stories of India in recent years, and would not have happened if the modern computer had not been first invented in the USA.

Therefore (MC): Countries which have frequently been invaded should be grateful to their leaders who have recognised and taken advantage of the ideas and inventions of the invaders.

Marks
Summary or gist (without any ICs) – 1
Conclusion + gist – 2
Conclusion + 1 IC – 3
Conclusion + 2 IC – 4
Conclusion + 3 IC – 5
Identification of a counter-argument (CA) – 1. (Max 1 mark for this).

Main Conclusion (MC), Intermediate Conclusion (IC) and Counter-arguments (CA) must be correctly identified as such to gain credit for them.

Max 5 if MC not identified:
Gist + 1 IC – 2
Gist + 2 IC – 3
Gist + 3 IC – 4
Gist + 3 IC + CA – 5
General comment

The candidate is asked to analyse the structure of the argument. A common way to avoid scoring well is to misread the question as requiring some kind of evaluation or critical summary of the passage. This question does not ask the candidate either to find flaws in the argument, which is to do with evaluation, or to give a literary-critical appraisal of the passage, which is a completely different exercise and to do with the discipline of literary criticism, not thinking skills. The candidate has to read through the passage carefully and recognise the component parts of the argument that support a clearly identified main conclusion, i.e. the reasons, intermediate conclusions and counter-arguments. They can provide either the exact phrasing of each component identified in the passage or give a close and accurate paraphrase. Candidates should avoid outlining every reason, as they would not be credited for minor reasons, but look only for the main reasons and/or the intermediate conclusions and counter-arguments, if any. Good candidates would first identify the main conclusion as that enables them to outline clearly the reasoning structure.

Candidates should not give ellipsis (‘...’) by way of response. They should keep to the wording in the stimulus passage; if the wording is re-phrased it should be synonymous to the text in the passage and should include all the key phrases.
Example candidate response – grade A

The candidate begins well by precisely identifying the main conclusion in full. In the second paragraph the candidate goes on to identify a reason (“invasion may not be such a bad thing if...”), but does not label it as the intermediate conclusion, and so falls short of the mark. The following minor reasons are not creditworthy. In the third paragraph the candidate correctly identifies two intermediate conclusions and in the last paragraph identifies the counter-argument precisely. The candidate earns credit for correctly...
identifying the main conclusion, two intermediate conclusions and the counter-argument. A full recognition of the structure should have led the candidate to identify the first reason as an intermediate conclusion and so gain the sixth mark.

Mark awarded = 5 out of 6
Example candidate response – grade C

2. Main conclusion: invasion may not be such a bad thing if it leads to an enrichment of culture in the subject countries.

Main conclusion: Long-term benefits of occupation are overlooked because of the short-term injustices of being invaded.

R1: Our private life gets directly (and negatively) affected by what is happening in our country during an invasion.

R2: Most countries have been invaded and this has led to the culture and values of invading nations being superimposed on the subject nations.

R3: Brahmo Samaj was founded by Raja Rammohan Roy.

IC1: Invasion may not be such a bad thing if it leads to an enrichment of culture in the subject countries.

R4: They think and reflect to find opportunities to enrich the lives and traditions of own people.

IC2: Could explain why British Raj had influence on India.

IC3: Knowledge and know-how from the West shaped modern India.

R5: No Bollywood without Hollywood.

R6: No film industry without cinema photography.

R7: No software without modern computer.
Examiner comment – grade C

This candidate clearly understands how to go about the task of analysing an argument and undertakes to respond in a neat and orderly manner. However, the candidate misidentifies the main conclusion; R2 and R3 so identified are minor reasoning and so not creditworthy. Two of the intermediate conclusions identified are correct. The rest are either only minor reasoning or irrelevant to the main conclusion, and the counter-argument has not been picked out. The candidate is credited for the two correct intermediate conclusions and for the gist of the argument. Had the candidate not misplaced the main conclusion they would probably have analysed the structure more accurately.

Mark awarded = 3 out of 6
Example candidate response – grade E

Question 2

NU’s argument is that countries that are invaded should not be angry or upset at the fact that they are being invaded by another country but should be glad to receive parts of the invading country’s culture and take what they can from them in the sense of new inventions and ideology. NU gives examples of how India has grown and adapted to the modern world due to it being invaded. NU states that the long-term benefits outweigh the short-term injustices because they gain so much diversity in their culture and learn so much from the invading country. Such as India becoming industrialized due to the British Industrial Revolution and how Hollywood, a large part of Indian culture, was adapted from the US Hollywood. NU says that even though initially the invasion strikes fear and anger in the people it will one day bring great joy and better the lives of the people in the country. NU concludes with the statement the invaded countries should show gratitude to the invaders because they are being brought knowledge and inventions which will better their lives in the long-term aspect of things.

gish

Examiner comment – grade E

The candidate has completely ignored the requirements of the question. This is merely a re-statement or summary of the passage. The candidate can earn no more than one mark for identifying the gist of what the passage is about.

Mark awarded = 1 out of 6
Question 3

3. Give a critical evaluation of NU's argument in Document 1, by identifying and explaining strengths, weaknesses, implicit assumptions and flaws. [9]

**DOCUMENT 1**

**A Blessing in Disguise**

Most people would agree that the invasion and occupation of another country should be condemned. Why? There is this idea of 'self-determination' – that the people living in a country should decide their own future and govern themselves. In general, we do not like bullies in our private lives and this feeling carries across to public life too; indeed, our private life gets directly (and negatively) affected by what is happening in our country during an invasion. It is difficult to carry on with your grocery shopping when there is a tank from an enemy driving down the street. The difficulty with this argument is that the long-term benefits of occupation are overlooked because of the short-term injustices of being invaded.

In actual fact, invasion may not be such a bad thing if it leads to an enrichment of culture in the subject countries. Most countries have been invaded several times and this has led to the culture and values of the invading nations being superimposed on the subject nations. The process by which the British occupation of India influenced its culture is a classic example. Some of the greatest Indian thinkers ensured that India took something from its invaders. The Brahma Samaj was founded by Raja Rammohun Roy (1774 – 1833), whom some see as the founder of modern India. This was a movement of modernisation for societies that had not industrialised in the way that the West had done. Raja Rammohun Roy directed his pupils to read the great Western philosopher Voltaire (1694 – 1778), but he also drew on much earlier Islamic and Persian influences as well as the ancient Greek philosopher Aristotle. So we can see that true leaders and intellectuals do not resist the culture of invaders; instead, they think and reflect, so that they can find opportunities to use the incoming culture to enrich the lives and traditions of their own people. This could explain why the so-called British Raj (1858 – 1947) had such a tremendous influence on the India of today.

Knowledge and know-how from the West have greatly contributed to shaping modern India. There would be no Bollywood without Hollywood. Indeed, India would have no film industry if the West had not invented cinema photography. The British Empire passed on to India its own vast industrial and technological acquisitions. In effect, the current industrialisation of India could not have happened without the Industrial Revolution that took place in Britain in the eighteenth and nineteenth centuries. Software development has become one of the greatest business success stories of India in recent years, yet even this would not have happened if the modern computer had not been first invented and then widely adopted by companies in the USA. Of course, these innovations and advances do not come without problems, but that is another matter. What I can assert confidently is that countries which have frequently been invaded should be grateful to their leaders who have recognised and taken advantage of the ideas and inventions of the invaders.

NU
Mark scheme

3 Give a critical evaluation of NU’s argument in Document 1, by identifying and explaining strengths, weaknesses, implicit assumptions and flaws. [9]

Paragraph 1

Most people would agree that the invasion and occupation of another country should be condemned. Why? There is this idea of ‘self-determination’ – that the people living in a country should decide their own future and govern themselves.

This explanation is questionable. There are other explanations why invasions are condemned – international law, human rights violation, destruction etc.

In general, we do not like bullies in our private lives and this feeling carries across to public life too; indeed, our private life gets directly (and negatively) affected by what is happening in our country during an invasion. It is difficult to carry on with your grocery shopping when there is a tank from an enemy driving down the street.

Here is a straw man/flawed analogy, in comparing an invasion to bullying and the effects of invasion to a minor disruption such as inconvenience in everyday shopping.

The difficulty with this argument is that the long-term benefits of occupation are overlooked because of the short-term injustices of being invaded.

A reductionist fallacy – deliberate underestimation of invasion.

Shift in meaning – From describing effects of invasion as discomfort to suffering ‘injustice’.

Straw man – The whole passages trivialises the consequences of invasion in order to argue that invading another country has many advantages for that country. Only if this premise can be accepted can the conclusion be drawn that frequently-invaded countries should be grateful.

Strength – This paragraph demonstrates that not the consequences of invasions are not all negative.

Paragraph 2

In actual fact, invasion cannot be such a bad thing if it leads to an enrichment of culture in the subject countries.

Hypothetical reasoning: a pointless reasoning on the basis of hypothesis – since it depends on the evaluation of the consequences of the invasion i.e. on the truth of whether it has enriched the culture of another country or not.

Assumption – that countries that are invaded do not have parallel culture and values as rich as the invaders.
Assumption – that cultural mixing leads to enrichment.
Assumption – that any gain in culture outweighs any loss.
Assumption – that “true leaders and intellectuals” do not think invasion is wrong. True intellectuals and leaders are well-known to be in the forefront of leading resistance movements.

Necessary/sufficient condition; begging the question: ability to think and reflect may be a necessary but not sufficient condition for becoming a “true leader and intellectual”, there would have to be other criteria.

Generalisation from Roy to “true leaders and intellectuals”.

Paper 4 – Applied Reasoning

Paragraph 3

Conflicting effects of invasion with effects of modern commerce; Industrial Revolution was accessed via colonisation but software development are accessed through globalisation.

An alternative explanation as to why India has progressed into its modern shape is because it cut free from its colonial heritage and was free to join the global market which it could not have done if it was still a subject nation.

Another possible explanation: there may have been vast market reforms based on modern ideas of trade liberalisation which has nothing in common with older ideas of trade and commerce such as the British Empire held.

Flaw of cause and effect (relevance): US did not invade India; the passing on of info-tech to India is not as a result of invasion.

Generalisation from the case of India to countries which have been frequently invaded.

For each sound evaluative point 1 mark and 2 for a developed point, up to maximum of 9 marks. No mark given for mere counter-assertions.

General comment

This question requires the candidate to critically evaluate the argument by identifying and explaining with precision and clarity the flaws, unstated assumptions and other obvious and significant weaknesses in the reasoning of the argument. If strengths in reasoning are identified candidates should explain how they critically strengthen the main conclusion. Candidates who did well demonstrated a clear idea of the main conclusion of the argument in evaluating whether the identified reasoning can support it. The best responses demonstrate ability to expose unstated assumptions underlying the reasoning and explain how this weakens the argument. Candidates who simply label explicit reasons as ‘assumptions’ and explain them as weaknesses are unlikely to be credited, unless they have targeted a clear flaw.

Candidates are not given credit for simply saying that a line of reasoning is weak because it has insufficient or no evidence. Saying that there are no examples or not enough examples to demonstrate a line of reasoning is another common excuse. Candidates have to precisely target the flaw and explain it. Candidates who label weak reasoning with critical thinking terminology also have to explain it sufficiently to demonstrate they have understood the weakness. If a weakness or assumption is only accurately identified the candidate will get one mark; the second mark is reserved for a developed or clear explanation of the weakness. The candidate can also access credit for offering a clear overall concluding judgment on the passage.

The candidate will not access any mark for giving a literary-critical appraisal of the passage, as that is going completely astray from the requirements of the question. To criticise the literary features of the passage is a different exercise and to do with the discipline of literary criticism, not arguments. For example, “NU’s presentation of the argument is good and cohesive. He displays remarkable unity of thought. He writes in a confident, lucid style, and uses contrast to great effect such as introducing the common notion why invasion is undesirable, then contrasting it with an array of historical facts about invasion which throws into focus his reasons for why invasions may not be such a bad thing.” Such responses may validly earn credit in a literature exam, but candidates who respond with such literary criticism in a Critical Thinking paper gain no credit, however well they write.
Q. No. 3.

WEAKNESSES:

- The author focuses exclusively on India and ignores the rest of the colonial world. Using such a regionalized example is not enough to prove the conclusion to be applicable to the whole world.
- The author does not give any concrete statistics to support his argument.
- The author uses the example of Raja Rammohun to generalize prematurely that true leaders do not resist culture of invaders. One example is not enough to support such a sweeping generalization.
- The author fails to recognize that cultural and technological influences can be imported through trade and commerce also, making invasion and occupation unnecessary and a horrible act.
- The author fails to analyse the benefits the aggressor countries themselves reap through invasion and seems to think that invasion is solely in the interest of the subject countries.
Author provides the example of USA software companies influencing India, which contradicts his argument that invasion and occupation is necessary for such influences, as the USA never occupied India.

ASSUMPTIONS

The author assumes that all invaders are as benevolent as the British and that the local cultures are not simply exterminated, as indeed has happened several times in history.

The author assumes that Voltaire’s influence on Raja Rammohun Roy was due to the British Raj, though in fact, Raja Rammohun Roy died before the British Raj even began.

The author assumes that long-term benefits of occupation outweigh short-term injustices.

STRENGTHS

The author expands and elaborates on the example of Raja Rammohun Roy to support his argument.
Examiner comment – grade A

The candidate attempts this task in a methodical and focused manner, first outlining the weaknesses, then assumptions and finally the strengths. The first flaw of generalisation (“focuses exclusively on India...”) is given a succinct and unambiguous explanation, “using such a regionalized example ... not enough to prove the conclusion ... applicable to the whole world”, and has gained two marks as a developed explanation of the weakness. The second bullet point merely says there is no evidence to support the argument and falls short of credit.

The next identified flaw, the third bullet point, generalising from Raja Rammohun Roy to others is also explained adequately to merit two marks.

The candidate loses focus in the fourth bullet point, which is a statement of where NU’s failures lie, whereas the candidate should have focused on the flaw in NU’s reasoning – not that he fails to recognise it but that he trivialises or downplays the effects of invasion in applauding the benefits. Likewise, the fifth bullet point examines what NU fails to do and provides a counter-argument and so is not properly evaluating the weakness of the reasoning.

The sixth bullet point clearly targets a flaw of how NU weakens his own argument. More correctly, this is not a contradiction but an inconsistency, but the candidate has sufficiently explained how the reasoning is weakened to gain two marks.

Under ‘assumptions’ the candidate correctly pinpoints an assumption on which NU’s reasoning depends – that “all invaders are as benevolent as the British”. The candidate then explains the flaw well by pointing out that in fact the opposite is the case. The second assumption is not an assumption but is merely correcting NU’s facts. The last is not an unstated assumption by NU, but what has been explicitly stated.

The candidate does not get credit for the identified ‘strength’ as it is no more than a comment that the given example is striking, but not how it therefore strengthens the reasoning. To access the mark for strength, the candidate needs to have asked themself the critical question: ‘is there anything about the argument that lends weight to the conclusion?’ which is the right direction in which to look for strengths, if any, in the argument.

Mark awarded = 8 out of 9
Example candidate response – grade C

In the argument, the NU belittles the impact that occupation has in the short-term. The NU tries to make it seem like an empty threat, even down the street, in a bad situation. The NU does not consider the civilian lives lost and affected by occupation. The argument is strong in that it deals with possible counter-arguments effectively, and it provides many examples. The technological advancements in India that resulted from Western occupation.

The argument, however, makes the assumption that all occupations have positive long-term effects. The argument fails to mention that countries have not positively benefited from occupation like Iran, Iraq, and Pakistan. The argument also assumes that the ways of the West are superior to Eastern ideals. It does not seem to matter that Eastern cultural practices and traditions have been destroyed by occupation. The article implies that the East does not have the right to self-determination, but the West does. The West imposes its ideas on others, despite opposition. The argument would have been more effective if it used examples other than India to show positive long-term effects of occupation. Positive is a very relative term, hence what is positive to one country could be perceived as negative by another. The NU uses many opinions and
Examiner comment – grade C

The candidate shows good effort here, but the response contains only two precise and clearly explained weaknesses, and one strength. The candidate writes at unnecessary length and the response is rather rambling and imprecise. Much of it counter-argues NU’s argument, offers some speculation, and is inaccurate in identifying assumptions.

The response begins with a precise identification and explanation of a weakness – that NU trivialises the impact of occupation – which earns credit. The candidate just about identifies a strength, i.e. that the argument points to some positive consequences as well, but this is not explained adequately. An unstated assumption about cultural gains is explained sufficiently to gain credit. The rest of the argument does not have any creditworthy element, as already explained above. The candidate could have gained more marks had they focused more on the question requirements, which were to find and explain assumptions, flaws and/or strengths.

Mark awarded = 4 out of 9
Example candidate response – grade E

3. Document 1 has strength in the specific amount of detail used to describe how the British Raj and the invasion of India gave the country its success. The document also shows the other side of the argument at the beginning. However, it is easy to find weaknesses and flaws present throughout the document, even though the counter-argument was stated, there was not enough information given to suspect that the argument was legitimate. Also, the document is assuming that all invasions are forceful and use “tanks,” when its argument and evidence only talk of India being invaded, and that invasion did not contain “tanks or driving down the streets.” The evidence used to back up the documents main message was also a flaw. The document only used India as an example, and although the immense detail was greater, the article seemed to be about India specifically, when truly it was about all invade countries.

Examiner comment – grade E

The candidate has not focused properly on the question requirement. It is advisable for candidates not to start an evaluation by appraising the argument favourably or looking for strengths. The degree of strength is apparent only when the weaknesses of reasoning have been evaluated. In this case the candidate starts by looking at a valid strength, but this is not accurately explained. The assumption stated is incorrect. The last point, that India is the only example used, correctly targets a flaw but the explanation as to why this is a generalisation is inadequate.

Mark awarded = 2 out of 9
Question 4

4 ‘Former colonial powers should compensate countries they have once occupied.’

To what extent do you agree with this statement? Construct a well-reasoned argument in support of your view, commenting critically on some or all of Documents 1 to 5, and introducing ideas of your own. [30]

DOCUMENT 1

A Blessing in Disguise

Most people would agree that the invasion and occupation of another country should be condemned. Why? There is this idea of ‘self-determination’ – that the people living in a country should decide their own future and govern themselves. In general, we do not like bullies in our private lives and this feeling carries across to public life too; indeed, our private life gets directly (and negatively) affected by what is happening in our country during an invasion. It is difficult to carry on with your grocery shopping when there is a tank from an enemy driving down the street. The difficulty with this argument is that the long-term benefits of occupation are overlooked because of the short-term injustices of being invaded.

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NU
DOCUMENT 2

Is it wrong to say that colonialism was good for the world?

Charlie_52: Most of the people state that it has negatively impacted the world, but I take the opposite position and state that because of colonialism, so many people in the West (such as those in Europe and America) have advanced so much in terms of technology and resources that they have improved the lives of people like us everyday. If it weren’t for colonialism, Europe and America would not be the strong political powers they are today and Americans like me would not be able to enjoy our privileged lives. I don’t see how you can say colonialism is completely terrible since the sacrifices of a few slaves have greatly improved my life. If I had the chance, I wouldn’t go back and prevent colonialism from happening since, if I did, I wouldn’t have this great life I enjoy now.

xx_kt_xx: For the most part - bad. Be serious. What countries came out good as former colonies and why? The US because it colonised other countries. South Korea and Taiwan because of massive aid during the cold war. Singapore because of its geopolitical position. You could also make a case for a few others but the majority of former colonies and ‘imperialised’ nations are doing really badly. Look up any country in Africa, most of Latin America, a big chunk of Asia, even Eastern Europe! All of these countries were screwed up because of imperialism.

Bloggers

DOCUMENT 3

Joys and woes of Empire

British rule became associated with a number of benefits. One was that, in general, rule of law and the attempt to record land ownership provided a basis upon which native people might one day create their own systems of self-government. At least lip service was paid to ideals like ‘democracy’, ‘freedom of speech’, and ‘rights of the individual’. Another benefit was the rapid development of the infrastructure in colonies that were deemed ripe for investment and growth. Above all, and despite their many failings and brutalities, the British tended to approach the enormous task of imperial rule with a relatively human pragmatism.

Of course, the fact of Empire had a number of impacts upon the United Kingdom too, both positive and negative. British politicians of all parties were quick to discern in the Empire a means of uniting the people in a common cause, as a way of inspiring a sense of international mission. A great and messy amount of personal and national rubbish could be dumped elsewhere – principally upon ‘inferior’ black and brown people throughout the imperial system. They thus became repositories of much that was unwanted and disowned at home. It also provided manifold opportunities for making profitable careers, and for personal, financial and sexual exploitation. It introduced strange and exotic foods, flora and fauna, useful words, outlandish philosophies, different sports, other cultures and a whole host of unfamiliar experiences into the British way of life. It can be argued, on the one hand, that the Empire marked out Britain as an island race with connections across the globe matched by no other state. Others argue that the Empire was a matter of indifference to most British people, who hardly noticed the passing of Empire, and were increasingly happy to exchange the imperial mission for the joys of becoming a consumer society.

Denis Judd, Professor of History, London Metropolitan University
DOCUMENT 4

What happened to Africa

Colonialism caused the loss of sovereignty, which is the loss of the right of a state to control its own destiny, to participate in its own development, to conduct its own diplomacy and international relations and to decide which outside nations to associate with or to emulate. Above all, it took away the right of the state to manage or even mismanage its own affairs, take pride and pleasure in its success, and derive lessons, frustration and experience from its failures. Many African nationalists and critics of colonialism see the independence gained from the withdrawing colonial powers as only partial liberation. Some call it ‘false independence’. Full or real freedom, they believe, will come with economic independence.

Colonialism bred political crisis. In disrupting pre-colonial political systems that worked for Africans, and by imposing alien models, colonialism laid the seeds of political crisis, say its critics. By the redrawing of the map of Africa, throwing diverse people together without consideration for established borders, ethnic conflicts were created that are destabilising the continent. The new nation-states were artificial and many were too small to be viable. Less than a third of the countries in Africa have populations of more than 10 million. Western multi-party democracy imposed by colonial powers polarised African societies. “It was the introduction of party politics by colonial administration that set off the fire of ethnic conflicts in Nigeria,” wrote Itodo Ojobo in the New Nigerian newspaper in 1986.

Scribd (social publishing and reading website)
DOCUMENT 5

Colonialism and Imperialism

1. Colonialism supports Capitalists
2. Capitalists assemble Capital
3. Capital builds Colonies
4. Colonies provide Raw Materials
5. Raw Materials are used by Factories
6. Factories produce Products
7. Products are consumed by Workers
8. Workers are the labour in Profit
9. Profit goes back to Capital

Colonialism establishes Colonies
Raw Materials consumed by Workers
Products created by Factories
Capital builds Colonies
Profit goes back to Capitalists
4. ‘Former colonial powers should compensate countries they have once occupied.’  

To what extent do you agree with this statement? Construct a well-reasoned argument in support of your view, commenting critically on some or all of Documents 1 to 5, and introducing ideas of your own.  

<table>
<thead>
<tr>
<th>Band</th>
<th>Overall</th>
<th>Within</th>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td>IV 27–30</td>
<td>Can consider counter-positions to own argument and reflect on implications in arriving at conclusion.</td>
<td>Developed consideration of counter-positions. Knows precisely what complexities face own argument.</td>
<td>30</td>
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<td>Simple statement of 1 or 2 counter-arguments to own argument.</td>
<td>29</td>
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<td>A critical stance: ideally an evaluation of sources, and explicit consideration of counter-arguments (or conflicting sources). Must reference 3+ documents.</td>
<td>Well-constructed, coherent argument. Candidates introduce their own ideas and arguments building their own position. Can compare and contrast documents and draw inferences synthesising arguments from different documents. Good interpretation of sources.</td>
<td>26</td>
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<tr>
<td>III 17–21/22–26</td>
<td>Occasional explicit, precise / developed critical reasoning of 2+ points. Can compare and contrast documents relevantly.</td>
<td></td>
<td>24</td>
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<td>A reasoned stance: a clear conclusion, supported by reasons clearly expressed but uncritically selected from the sources. Reference to at least 2 documents.</td>
<td>Some independent reasoning / implicit critical comments. Clear statement of 3/4 reasons in support.</td>
<td>16</td>
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<td></td>
<td></td>
<td>Reasons indiscriminately selected. Little clear independent or no independent reasoning. Some irrelevance/deviation from the question. May be multiple conclusions with little support for each one.</td>
<td>14</td>
</tr>
<tr>
<td>II 07–11/12–16</td>
<td>‘Pub rhetoric’: unclear or no conclusion; reasoning that goes off question target at a tangent; substantial irrelevant material. Completely misunderstands or no understanding of question</td>
<td>Reproduced reasoning from (2) and (3). Disorganised. Unconvincing attempts to construct reasoning.</td>
<td>06</td>
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<td>Stream of consciousness. Wholly irrelevant / deviant / incoherent material. No attempt.</td>
<td>04</td>
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<td>02</td>
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General comment

Good and very good answers are characterised by critical and perceptive response to the source materials, critical reasoning and creative skill in offering further lines of reasoning, either through synthesis of inferences drawn from the stimulus sources, or integrating source material with own ideas. The four components credited in such responses are:

- judicious selection of relevant and useful material – evidence, opinion, information, argument – from the stimulus sources;
- critical reasoning – combining information and opinion from multiple sources through critical evaluation and forging inferences; cross-referencing data or ideas across multiple sources to support or challenge given claims; challenging or supporting claims made in the sources with own ideas and own reasoning or counter-arguments;
- further argument – creatively building a coherent and well-reasoned case by integrating material in the documents with own ideas and arguments;
- drawing a clear conclusion which is supported by, and consistent with, selected evidence and reasoning used.

Excellent answers will have demonstrated a further component:

- an ability to anticipate counter-arguments and objections that may rise against own argument, and offer some response to these.

Good candidates go about this task in various ways. Some select and organise the relevant material on either side of the debate and mark out neutral material, if relevant, before making critical comments. Others critically evaluate the documents ad hoc as they build up their case. But in every case they would be articulating their answers in response to the stimulus sources and their own main conclusion.
Paper 4 Thinking Skills

I agree somewhat with the statement that former colonial powers should compensate the powers they once occupied, and I think the biggest reason for this is purely economic.

Looking at Document 15, it becomes clear that, despite or not, the colony’s economy on its own is hardly self-sufficient. They were rarely industrialized themselves, instead left to produce large quantities of raw materials. As evidenced by the chart, there is little profit purely from raw materials — rather, those raw materials are not worth particularly much until they are manufactured into goods. This is where it gets even tougher for former colonial powers, since they cannot manufacture goods they must import them. In essence, a former colony (especially smaller ones) can rarely be self-sufficient because, by definition, the colonial power has crippled the local economy of the colonials, in order to feed that of the growing empire.

This lack of self-sufficiency and independence is supported by some of the ideas brought up in Document 4. Again, by definition, these nations lost their right to self-determination when under the colonial power, and only regained it once colonial powers leave. The problem, again, is that these societies have been crippled by empire and typically are not prepared for self-rule. In case of Doc. 5, they were not prepared economically. In doc. 4, they are not prepared for self-rule, socially speaking. Whether that is due to borders that do not reflect the ethnic boundaries within said countries (see: Sudan / Congo), or simply the daunting task...
of creating a legitimate government or very short noble. Many colonial powers abandoned their colonies en masse in the 1980s with little regard for the transition process, it is simply not reasonable to thrust such a large burden on responsibility of sustaining a nation, without some assistance. That is why I personally favor compensation — not necessarily one-off with sight past wrongs (I do not believe money can truly heal such wounds) but because such economic help can prove to be difference between a strong central government that manages to modernize its nation and one that collapses into anarchy. That in fact, the economic woes from 1980s and 1990s are only echoes in 44 as it mentions the small populations being a microcosm of the United States. With limited people and capital, industrialization seems impossible.

That said, is industrialization the end all, golden ticket out of poverty? Certainly a subsistence economy is not profitable in the least. Farming and raw material producers are typically at the mercy of the many countries, even after attempts to band together, the only producers that seem to have any (quite due to the sheer volume of world demand) is OPEC. That said, while virtually every country in the "first world" is industrialized, "industrialization is a dangerous and risky economic path to take. In the 1970s and 1980s, Latin American countries attempting to industrialize were defaulted on their loans to the IMF because despite continued loans and capital injections, they could not reach self-sufficiency. That is the risk of "compensation," purely for economic means -
it could get said colonies addicted, so to speak, on such aid, and when it inevitably runs out, the country’s economy could very well collapse once more. That is the risk they face in the up hired battle towards industrialization.

The remaining documents revolve around whether there are any positive aspects of colonization—though, as I have stated before, I do not personally believe it matters if colonization was good or bad for natives (I personally think imperialism was one of the highest periods of human history) since the issue of compensation will not change anything about colonial treatment, but rather we must focus on the future.

That said, I do want to briefly touch on some points brought up in these documents. First, Document 2— I am appalled by Charlie Sr’s statement—yes, it's colonialism was morally permissible under a utilitarian framework (to greatest amount of happiness for greatest number of people), but even if we are to ignore the fact that he supports slavery, we must remember utilitarianism crucial flaw—we cannot measure happiness. We do not know if the pleasures enjoyed by a slave and racist Charlie Sr are outweighed by the suffering of millions living in servitude, whether in slavery or in a colony, or if any social construct utilitarianism protects. Thus, his myopic and selfish world view is hardly a compelling argument in support of colonialism.

Finally, I think when you look at Documents 3 and 4, they show why you should not seek to
heal the wounds of the past with money. Look at the
examples they use: in document one, philosophy, Bollywoo
d and its industrialization (which I have already
mentioned in previous). But philosophy, films —
these are cultural ideas — and ideas can
not be necessarily influenced by monetary
compensation. The ardent Indian nationalist will
not be able to bring back Indian philosophy
simply because he is compensated, and
the British citizen should not worry that western
ideals lose grip because of compensation. In today’s
deeply interwoven community, ideas flow easier and
quicker than ever, and I do not think money
is particularly effective in influencing the way a
nation is formed.

Therefore, I do think monetary compensation
should be provided, but not for more traditional
measures (i.e., support for centuries of sentiment) but because
such aid is almost crucial to survive in
today’s economy, and with the many risks
industrialization/developing countries face — they need
all the help they can get.

V. gd.

Bend w

+4 CRs

30
Examiners comment – grade A

This candidate has read through the source materials carefully and planned, organised and constructed their response. There is clear evidence of all five components. They have framed a clear judgement about what their position in the debate is. Their conclusion is qualified, i.e. neither sweeping nor too simplistic, because it looks at both sides of the argument and has seen the complexities that arise. The candidate supports their judgement with well-reasoned arguments drawn both from critically studying the stimulus sources and integrating material with their own ideas and further arguments.

The candidate first focuses on document 5 in support of their argument. Critically evaluating the evidence and information in that document, they produce a critical inference: “by definition the colonial power has crippled the local economy of the colonials in order to feed that of the growing empire.” Further critical reasoning is constructed through comparing in documents 4 and 5, drawing other inferences and introducing other supporting examples in addition to the sources (“Sudan, Congo”). The candidate looks at the other side of the argument, i.e. the dangers of compensation, and counters an objection to the argument for compensation and accepts it is a risk. The candidate challenges the argument that compensation can make right the wrongs of the past, stating the reason “it will not change anything about colonial treatments”. The candidate thus provides the intermediate conclusion, which is also their further argument that compensation must have its focus in the future not the past.

Although the candidate makes it clear that they do not consider the rights and wrongs of colonialism a relevant issue for compensation, the candidate challenges the arguments in documents 1 and 2 in favour of invasion and slavery. The candidate constructs a further intermediate conclusion: “Thus (Charlie_52’s) myopic and selfish world view is hardly a compelling argument in support of colonialism”. More critical reasoning to support their particular case for compensation is constructed through critically evaluating claims in documents 3 and 1: “In today’s deeply interwoven community, ideas flow easier and quicker than ever, and I do not think money is particularly effective in influencing the way a nation thinks.”

Having built up their intermediate conclusions, the candidate is now able to assert confidently their final explicit conclusion: “Therefore, I do think monetary compensation should be provided, but not for more traditional reasons (i.e. payback for centuries of servitude) but because such aid is almost crucial to survive in today’s economy, and ... industrializing / developing countries ... need all the help they can get.”

The candidate has creatively built up a cogent, relevant and well-reasoned argument in response to the source materials and question. Throughout, the candidate has shown awareness of what complexities faced their own argument and demonstrated developed consideration of counter-positions.

Mark awarded = 30 out of 30
Example candidate response – grade C

4. The issue of colonialism is a complex one, and as such should be treated with due care. Some believe that colonial powers should have to compensate countries they have occupied. But to apply this view in all cases would be to oversimplify. Much, of course, depends on the impact on the colony.

Many colonies have enjoyed some positive aspects during and after occupation. For instance, small African countries may be at an advantage to be have been "attached" to the British Empire, and it would ensure their survival in a world where political power determines so much. However, as a result of that a colony may lose its self-identity, economic growth, and ability to determine its future. Document 4 argues this point.

As is said in document 1, the British Empire passed along to India industrial and technological acquisitions. But it also claims, unsupported, that this could not have happened without the Industrial Revolution that took place in Britain. This may not have been the case. India
Charlie 52 in Document 2 argues from a selfish viewpoint. He says that because he and his country have benefited, that the “sacrifices of a few slaves” was not so bad. This is not a good way of looking at colonies. It is not right for developed countries to hide behind apparent views for freedom and democracy, while believing this. The effect that slavery had was not just on a few people, but millions. We should not forget this.

It is clear that the negative effects of colonisation have been huge. As expressed in Document 3, most of the benefits were for the occupier. What is important is that we move forward in the right way. Former colonies should not be compensated purely financially, but I believe we have a responsibility towards them. Those countries which are struggling to develop should be helped to do so – trade should be encouraged between former invaders and colonies. Colonies need a role to play in former colonies must have a role to play.
Examiner comment – grade C

This candidate shows potential to have done better but there are two significant weaknesses in their response that costs them credit: having no clear conclusion, and not comparing and contrasting material in stimulus sources.

The candidate begins with good focus by outlining the complexities of the argument and laying reasoning for constructing a strong case. They provide some insightful critical comments on document 4, then on document 1. The critical comments on both documents are independent reasoning, as they are more than summaries or mere restatements of what there is in the text; but the candidate does not compare or combine information to form critical inferences or reasoning.

Similarly, the candidate evaluates document 2 and provides another explicit critical inference as a further argument: “It is not right for developed countries to hide behind apparent views for freedom and democracy, while believing this.”

However, having drawn up reasoning about the negative effects of colonisation, the candidate does not then build up a clear coherent response as to whether former colonies ought to be compensated or not. The candidate ambiguously states that “former colonies should not be compensated purely financially” for which no clear reasoning was given. The candidate then digresses into a different issue, one of building trade relations between former invaders and colonies, which is irrelevant to the debate about compensation for consequences of invasion.

The candidate begins in a focused manner but somehow manages to lose sight of the argument. There is no comparison of sources and no clear conclusion, but there are some good critical comments and independent reasoning.

Mark awarded = 16 out of 30
4. "Former colonial powers should compensate countries they have once occupied."

Every country that was once occupied by another nation should be compensated, no matter if the visiting country left a positive or negative impression effect on the country.

A country tends to invade another country for something in return. It may be to increase the size of an empire, or for raw materials, or for "self-determination" (source 1). A country always invades to make itself more powerful, not intending to help out the other countries, and therefore, as a service fee or for compensation, they to the developing nation should receive something. A classic example of this is the British exploitation of the Congo. Many were killed and exploited here, for its resources, and sent back as profits to the mother nation, as seen in source 5. Many times, as the resources are fully exploited, and the land is all used up, the invading nation decides to leave, not harming the native country, and leaving them with a burden of a country without resource, so they cannot develop, or they develop at a slow pace.
However, some countries like India did gain a lot from British empire, such as modernization, increase in education, and innovation. The British Empire first came to India for its resources. It wanted to obtain the necessary resources to use for its self-interest of Britain, not for India. Luckily, India obtained technology and it created hundreds of Bollywood movies a year, and it is the biggest industry in India, for the past couple of decades. But since the initial reasons to obtain India was for its resources, they should be compensated.

It can be noted that even though the GDP of India exponentially grows every year, poverty increases by the same amount. This can be argued that it was caused by the lack of resources the country has.

In conclusion, I have a negative view on imperialism. Document 4 provide valuable insight that colonialism leads to the loss of sovereignty. Each country should at least have the right to rule itself and its people. It should have
Examiner comment – grade E

The candidate has a clear conclusion stated at the outset. However, the supporting reasoning that follows is more anecdotal, and there is less effort at considering the matter in the sources. There is misinterpretation of document 1 in terms of ‘self-determination’. There are very few explicit references to stimulus sources or critical inferences. The candidate offers a further reasoning that the GDP of India is growing exponentially while poverty is increasing owing to the depletion of resources (caused by British occupation), but this is, in the logic of it, flawed. Despite these shortcomings, the conclusion is supported by some clear statements of support, e.g. “since the initial reasons to obtain India was for it’s [sic] resources, they should be compensated”, and since the candidate also has a clear conclusion they just manage to get into lower band 2 of the level descriptor.

Mark awarded = 12 out of 30