Statistics

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General comments

The overall standard of responses was pleasing. Candidates performed best in Paper Two Part A (Critical Reasoning), with Paper One Part B (Monadic and Dyadic Logic) once again presenting the greatest difficulty. The good performances in Paper Two Part A were particularly pleasing as candidates appeared to have noted the advice given in last year’s report for responses to refer directly and specifically to the text being analysed.

The introduction of an unseen Philosophy essay question did not impact upon the success of candidates. The quality of responses was, on the whole, similar for seen and unseen essays, after taking the differing conditions into account. The unseen essay is a useful tool for authenticating candidates’ work in this aspect of the subject.

Paper One

As in previous years, candidates who had prepared thoroughly performed extremely well in this section of the examination. The nature of the material covered in Paper One is such that a candidate’s success is determined solely by the extent of their preparation. Candidates who do not learn the basic rules do not do well.

Paper Two

**Part A: Critical Reasoning**

Responses to this section of the examination were very pleasing. Candidates were extremely responsive to the texts presented in the questions, and produced responses with a high level of specificity that displayed a thorough knowledge of critical reasoning techniques and principles.
Part B: Philosophy

The introduction of an unseen question enabled candidates to demonstrate their ability to apply knowledge to an unfamiliar situation.

Responses in this section of the paper, in both the unseen and the prepared essays, were generally at either A or C standard. The A standard responses had high levels of detail and generally contained analyses that moved beyond basic textbook information. Standard C responses, on the other hand, tended to discuss issues at surface level without any depth of analysis. Several candidates who attempted Question 1B either ignored the requirement to include a consideration of Rule Utilitarianism, or were clearly lacking in knowledge of the basic difference between Act and Rule Utilitarianism.

Sample responses

The following response was selected from those scripts that met the A standard in all criteria in both papers, and was awarded a Very High Achievement. It has been reproduced exactly as written and includes any spelling or grammatical errors made by the candidate. Some marker annotations are also visible.
Paper One

Question 1

(a)
(i) \( C \land S \supset W \) ✓
(ii) \( S \equiv (\neg C \lor \neg M) \) ✓
(iii) \( \neg S \supset (\neg C \land M) \lor W \) ✓
(iv) \( \neg C \land W > C \) ✓

(b)(i) The spectators are happy if and only if Canada doesn’t win the hockey and Australia wins a medal.
(ii) Either Canada wins the hockey and the Winter Olympics are successful, or it is not the case that if Australia wins a medal, the spectators will be happy.
(iii) If the Winter Olympics are successful, then it is not the case that an Australian wins a medal if and only if either Canada does not win the hockey or the spectators are not happy.
Question 2

(a) \( \begin{array}{c|c|c}
P & Q & \sim (P \lor Q) \neq (P \land \sim Q) \\
\hline
1 & 1 & 0 \ 0 \ 1 \ 1 \ 1 \ 1 \ 1 \ 0 \\
1 & 0 & 0 \ 0 \ 1 \ 1 \ 1 \ 1 \ 0 \\
0 & 1 & 0 \ 0 \ 1 \ 1 \ 0 \ 0 \ 0 \\
0 & 0 & 0 \ 0 \ 1 \ 1 \ 0 \ 0 \ 0 \\
\end{array} \)

Main column is entirely false, argument is a contradiction.

(b) \( \begin{array}{c|c|c|c|c}
R & Q & P & \sim (\sim Q \equiv P) \lor \sim (Q \supset \sim P) \\
\hline
1 & 1 & 1 & 1 \ 0 \ 0 \ 1 \ 1 \ 1 \ 0 \ 1 \ 1 \ 0 \\
1 & 0 & 1 & 1 \ 1 \ 1 \ 1 \ 0 \ 0 \ 1 \ 1 \ 1 \ 0 \\
1 & 1 & 0 & 1 \ 0 \ 1 \ 0 \ 0 \ 1 \ 1 \ 1 \ 1 \ 0 \\
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0 & 0 & 1 & 1 \ 1 \ 1 \ 0 \ 1 \ 1 \ 0 \ 1 \ 1 \ 0 \\
0 & 0 & 0 & 0 \ 1 \ 1 \ 0 \ 0 \ 1 \ 1 \ 1 \ 1 \\
\end{array} \)

Main column contains both true and false values; argument is a contingency.
Question 3

(a) (i) (a) is indifferent to (b). ✓
(ii) (b) is implied by (c). ✓
(iii) (b) is contradictory to (e). ✓
(iv) (c) is contrary to (e). ✓

(b) (i) (d) is subcontrary to (e). ✓
(ii) In a single row, both (d) and (e) can be true, (d) can be true and (e) can be false, and (d) can be false and (e) can be true, but both (d) and (e) cannot be false.
Question 4

(a)

1. \((p \equiv T) \to \sim (p \land q)\)  

2. \(R \to S\)

3. \(\sim (p \equiv T) \lor R\)

4. \(\sim (\sim q \lor S) \lor R\)

5. \(\sim (\sim q \lor S) \lor \sim R\)  

6. \(\sim q \lor S\)

7. \(\sim q \lor S\)

8. \(\sim q \lor S\)

9. \(\sim q \lor S\)

10. \(\sim q \lor S\)

11. \(\sim q \lor S\)

12. \(\sim (p \lor T) \lor (p \land q)\)

13. \(\sim p \lor q\)

14. \(\sim p \lor q\)

15. \(\sim p \lor q\)

16. \(\sim p \lor q\)

17. \(\sim p \lor q\)

All paths close: argument is valid.
(b)
1. $\sim K \lor (L > M) \Rightarrow (w \land p)$
2. $w = T \checkmark$
3. $T \land p \checkmark$
4. $\sim (K \lor (L > M)) \checkmark$
5. $\sim (K > (L \lor M)) \checkmark$
6. $\sim (L \lor M) \checkmark$
7. $\sim (L \lor M) \checkmark$
8. $\sim p \checkmark$
9. $\sim p \checkmark$
10. $w \checkmark$
11. $\sim w \checkmark$
12. $\sim w \checkmark$
13. $\sim \sim \checkmark$
14. $\sim \sim \checkmark$
15. $\sim K \lor (L > M) \Rightarrow (w \land p) \checkmark$

Not all paths close, argument is invalid.

Counter-example:

<table>
<thead>
<tr>
<th>K</th>
<th>L</th>
<th>M</th>
<th>T</th>
<th>P</th>
<th>W</th>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

$\checkmark$
Question 5

a. 
1. \((A \land B) \supset C\)
2. \(\sim (A \land B) \supset C\)
3. \(\sim A \lor \sim B\)

b. Not all paths close, argument is not a contradiction.

The first of the two trees tested the formula to see if it was a contradiction by working through the un-negated formula, and the second tested it to see if it was a tautology by working through the negated formula. It was neither a tautology nor contradiction so it must be a contingency.
Question 6

(a)
(i) $\forall x. \forall y. ((Wx \land My) \land element_of(y, K))$

(ii) $\exists x. \exists y. (Wx \land Ey)$

(iii) $(Wx \land Ey) \land (Wx \land Ey) \land (Wx \land Ey)$

(iv) $(Wx \land Ey) \land (Wx \land Ey) \land (Wx \land Ey)$

(b)
(i) No male wizards are death eaters.

(ii) Some wizards kill death eaters.

(iii) If a male plays quidditch, then they defeat snape... and snape... kills them.

(iv) Some male wizards sometimes have children which are not male and also death eaters.

Not all wizard fathers have female children that are death eaters.
Question 7

(a) \((\exists x)(Bx \land (Cy \land Cy))\)
   
   \((\forall x)(Bx \land (Cy \land Cy))\)
   
   \((\forall x)(Cy \land Cy)\) \(\lor\) \((\forall x)(Bx \land (Cy \land Cy))\)

\((Bx \land (Cy \land Cy))\) \(\lor\) \((Bx \land (Cy \land Cy))\)

\((Cy \land Cy)\) \(\lor\) \((O \land (1 \land 0))\) \(\lor\) \((0 \land 0)\)

\(0 \lor 0\)

The values provide a counterexample, as when they are implemented, the statement is false.

(b) \((\forall x)(Tx > Kx)\)
   
   \((\exists x)(Ta > Ka) \land (Jb \land Kb)\)
   
   \((\exists x)(Kx \land Lx)\)
   
   \((\forall x)(Kx \land Lx)\)
   
   \((\forall x)(Kx \land Lx)\)
   
   \((\forall x)(Ka \land La) \land (Kb \land Lb)\)
   
   \((\forall x)(Kx \land Lx)\)
   
   \((\forall x)(Ka \land La) \land (Kb \land Lb)\)
Question 8

(a) $0.

1. $(\forall x)(p_x \lor q_x) 

2. $

3. $(\forall x)(\neg p_x \lor q_x) \lor \neg p_x

4. $(\exists x)(\neg p_x \lor q_x) 

5. $(\exists x)(\neg p_x \land q_x) 

6. $(\neg p_x \lor q_x) 

7. $(p_a \lor q_a) 

8. $

9. $(p_a \land q_a) 

10. $(\neg p_a \lor q_a) 

11. $(p_a \lor q_a) 

12. $(\neg p_a \land q_a) 

13. $(a \lor b) 

14. Not all paths clothe, argument D.

15. Invalid. Counterexample:

\[
\begin{array}{ccc}
 & a & \\
L & L & \checkmark \\
R & 0 & \\
Q & 0 & \checkmark \\
\end{array}
\]
Question 8

1. $(\forall x)(\exists y)(\exists z)(y \land (x \iff y) \land (z \land (x \land z)))$
2. $(\forall x)(\exists y)(\exists z)(y \land (x \iff y) \land (z \land (x \land z)))$
3. $(\exists x)(\exists y)(x \land y \iff x)$
4. $(\exists x)(\forall y)(x)$
5. $(\exists x)(\forall y)(x)$
6. $(\forall x)(\exists y)(x)$
7. $(\forall x)(\exists y)(x)$
8. $(\exists y)(\forall x)(y \land (x \land y))$
9. $(\exists y)(\forall x)(y \land (x \land y))$
10. $(\exists x)(\forall y)(x)$
11. $(\exists x)(\forall y)(x)$
12. $(\exists x)(\forall y)(x)$

13. $(\exists x)(\forall y)(x)$
14. $(\exists x)(\forall y)(x)$
15. $(\exists x)(\forall y)(x)$
16. $(\exists x)(\forall y)(x)$
17. $(\exists x)(\forall y)(x)$
18. $(\exists x)(\forall y)(x)$
19. $(\exists x)(\forall y)(x)$
20. $(\exists x)(\forall y)(x)$

21. $(\exists x)(\forall y)(x)$
22. $(\exists x)(\forall y)(x)$
23. $(\exists x)(\forall y)(x)$
24. $(\exists x)(\forall y)(x)$

All paths close, argument is valid.
Question 9

(a) \( A \) = she comes over tonight
\( B = \) I get my study done
\( A \rightarrow \sim B \)

(b) The true meaning cannot be conveyed properly with propositional logic, due to being laden with metaphors.

(c) If taken as a saying, no. If taken literally:
\( A \) = He does it
\( B = x \) is dead
\( A \rightarrow B \) \( \checkmark \)

(d) As with c, if taken as a saying, the true meaning cannot be conveyed, but if taken literally:
\( a \) = Rocket science
\( b = \) "it"
\( x \) = x is y
\( \sim b \rightarrow a \) \( \checkmark \)
(a) \( P = P(a \land b) \)
\[ = P(a) \times P(b) \]
\[ = \frac{1}{3} \times \frac{1}{3} \]
\[ = \frac{1}{9} \]

(i) \( P = P(a \lor b) \)
\[ = P(a) + P(b) \]
\[ = \frac{1}{3} + \frac{1}{3} \]
\[ = \frac{2}{3} \]

(ii) \( P = P(a \lor b) - P(a \land b) \)
\[ = P(a) + P(b) - P(a \land b) \]
\[ = \frac{1}{3} + \frac{1}{3} - \frac{1}{9} \]
\[ = \frac{2}{3} - \frac{1}{9} \]
\[ = \frac{5}{9} \]

(b) Let: \( V \) = Camille gets into university...passing
\( E \) = Camille passes all of her examinations
\( T \) = Camille gets into university...failing

\[ P = (P(CE) \times P(CV)) + (P(C \bar{E}) \times P(C_T)) \]
\[ = (\frac{7}{8} \times \frac{1}{2}) + (\frac{1}{8} \times \frac{1}{2}) \]
\[ = \frac{7}{16} + \frac{1}{16} \]
\[ = \frac{8}{16} \]
\[ = \frac{1}{2} \]
(c) Let probability = 100% chance (p x gain)

<table>
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<th>Gain</th>
<th>Expected value</th>
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<td>1/20,000</td>
<td>$40,000</td>
<td>$2</td>
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\[
40,000 \times \frac{1}{20,000} = 2
\]

(d) The mistake in the argument is the misuse of the law of averages. The one making the argument is treating the plane’s flight as an independent event, rather than the dependent event that it is. The plane’s state (stare, experience of the crew, etc) are factors that affect the plane’s likelihood to crash. Even if the plane’s chance to crash were independent, expecting it to be “due” for a crash would be to utilize the Monte Carlo fallacy, assuming that because a random event has not occurred yet, it must occur soon.
Question 11.

<table>
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<th>R.V.B</th>
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<tr>
<td>Kevin</td>
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</tr>
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</table>

6.
(i) Yes; S was a possible...necessary condition for good results.
(ii) Yes; R.V.B was a possible...necessary condition for good results.
(iii) Yes; R and B were both...possible...sufficient conditions for good results.
(iv) Yes; R.G. and R.V.B were both possible sufficient conditions for good results.
(v) Yes; the complex...condition R.V.B was both a possible...necessary and sufficient condition.

C. The table contains...only possible...necessary/sufficient conditions; causation is...far from proved in these circumstances. What's more, not all complex conditions are present, meaning that...possible...sufficient and/or necessary conditions could...have been...left out.
Within this article, clipping, there are numerous examples of incorrect and fallacious reasoning. The questions, "Why has it taken so long for the Federal Government to review this pillaging of the public purse?" and "How long before we can expect this looting to cease?" and "It's not as if these former MPs are imperturbed upon leaving the Parliament, is it?" all fall under the loaded question fallacy, implying answers within the questions themselves. Another fallacy present is the faulty analogy fallacy, in the form of the unrelated and badly formed analogy at the end of the excerpt. The entire clipping also contains elements of ad hominem throughout, using colourfully aggressive language rather than proper argumentative language. Biased sampling could also be said to be taking place, due to the rather restricted timeframe of the expenditure numbers and the article implies that all federal politicians are responsible, rather than necessarily all contained within the collective share the group's attributes.
This article starts with a somewhat reasonable piece of deductive reasoning; namely, the link between a country’s religion and the foreign aid it gives. However, it soon falls apart due to its ignorance of the factors concerning foreign aid. The author is guilty of post hoc ergo propter hoc, or “false cause,” for putting forward religion as the dominant factor, ignoring international affairs, culture, and other such more influential things. It could also be seen as a case of biased sampling, as only one instance of disaster is mentioned. The article ends on a loaded question, implying an answer.
No reasoning is used correctly in this story, but it does contain two major fallacious argumentative elements. The first is the faulty analogy fallacy; the two examples are so far removed in context and function that they become worthless. The second is the post hoc, ergo propter hoc fallacy, present in the claim that the reason that you feel smarter after a couple of beers is due to the death of slower brain cells. Furthermore, there is no inductive or deductive reasoning to support this claim at all, giving the argument no ground to stand on.
Some reasoning is used correctly in this argument. For example, it affirms the antecedent. The argument’s basic structure is “If A, then B. So, therefore, ~A.” which is correct. However, the argument wrongly assumes that success of the “Equal Opportunities for Women” policy is sufficient for gender equality in parliament, but it is only a necessary condition at most. The author also wrongly ignores the plethora of other elements that could affect the prevalence of women in parliament.
The basic structure of the argument is raid: having 3 children is sufficient for divorce, therefore she does not want 3 children, as she does not want a divorce. However, the premises that she rests her argument on are not sound. The claim that if she has 3 children she will get a divorce is a misuse of the law of averages; just because it's one in three children does not mean that any given 3 children will have one among them. She is also treating the divorce as an independent chance-based event, when it is a dependant event, resulting in skewed logic.
Part B  Question 1b

Utilitarianism is a tested and strong system of ethics, brought to the forefront of moral thought by Jeremy Bentham and John Stuart Mill. In the question’s example, utilitarian principles are brought under the spotlight – how would an act utilitarian proceed?

Utilitarianism is also referred to as the “greatest happiness principle,” as its overall goal is to increase the overall happiness of as many people as possible, and to reduce the pain of as many people as possible. To a utilitarian, “the greater good” is considered morally right, and similar actions except with a greater negative outcome are considered wrong. Furthermore, Utilitarianism is broken up into Act Utilitarianism and Rule Utilitarianism, which utilize consideration of individual circumstance and blanket utilitarian rules, respectively.

In the described situation, a rule utilitarian would go through with the procedure, killing the homeless man. Act Utilitarianism considers individual circumstance and, in this situation, more good would be done by Obama’s continued life than his, working under the assumption that Obama would do good in his position. It is...
important to note that, in the eyes of a Utilitarian, everyone's happiness has equal worth. Obama is not receiving the transplant due to his status or...good deeds, but for the sake of other happiness as a result of his presidency.

In this situation, one of the key arguments against Utilitarianism is prevalent. Utilitarianism, particularly Act Utilitarianism, often demands that something, against human nature, needs to be done. Murder, for example, is frowned upon by almost all member of humanity...yet Utilitarianism advocates or demands it in certain situations, such as this. Even though it is painfully obvious which of the two men is more valuable to the world, no ordinary person could trade one man's life for another easily. It is worth noting, however, that a look of the homeless man's relatives. Another objection is the quantification of happiness, but that can only be applied in a situation with less certain outcomes: the lack of the homeless man's relatives and Obama's (presumed) abundance of them. It's difficult to say that Obama's life would bring...less happiness or more pain than the homeless man's. Without even considering presidential action.

A rule Utilitarian has a significantly different mode of deciding appropriate action, but is based on the same principles. Whereas an act Utilitarian will look at each individual situation and act according to the circumstances, a rule...
Utilitarian creates blanket rules based on ordinary outcomes with utilitarian goals in mind. For example, a rule utilitarian is likely to have: the rule “no murder” as murderering someone—most of the time—would cause more pain than pleasure overall. An act utilitarian would likely kill 1 person to save 10 lives...but a rule utilitarian probably wouldn’t.

In this situation...Whereas the act utilitarian would kill the homeless man and take his heart, a rule utilitarian may or may not, depending on his set of formulated rules. If the rule utilitarian has a blanket rule about all forms of taking another man’s life, then probably not...but it’s far from out of the question that the rule utilitarian may have rules about life-to-life exchanges, transplants, people of particular worth, or maybe just exceptions to other rules. In general, however, a rule utilitarian would probably not kill the homeless man due to the likelihood of such an action breaking one of his blanket rules.

In conclusion, to summarize, an act utilitarian would probably save Obama, whereas a rule utilitarian may not. While utilitarian morals have some hurdles to jump, ultimately, it is a rigid ethical system and is likely to live on for centuries to come...
Over the years, many philosophers of all kinds... of walks of life have made attempts to prove... or disprove the existence of the Christian God.

The strongest of these arguments against the existence of God is, by far, the "Problem of Evil." The name given to a set of problems related to reconciling the existence of the Christian God with the state of the world.

While the Problem of Evil is aimed squarely at the Christian God, it can be applied to the existence of any God that shares the 3 axioms of the Christian version: omnibenevolence, omnipotence, and omniscience. The problem of evil focuses on the discrepancies between such a creator and the world we live in... the most prominent one being the existence of evil itself... hence the name.

As Epicurus said... (paraphrased), God is... meant to be omnipotent, omniscient, and omnibenevolent. However, if God can see and stop evil, and doesn’t, he is remoralent. If God can stop and wants to stop evil, he is blind. If God can see and wants to stop evil... then he is blind. "Whence, then, is evil?" According to this element of the problem of evil, the Christian God cannot exist if evil exists. There are...
two main types of evil considered by the argument: Moral Evil and Natural Evil. Moral evil is conscious wrongful act, such as stealing, abuse and the like, and natural evil is the natural state of perceived evil in the world, such as animal killing each other in the wild or the reality of war. If either of these can be proved to exist, the argument runs, the Christian God cannot.

There are objections to this element of the problem of evil; however, the most prominent of which is the Free Will Defence. According to the Christian faith, God is not responsible for evil committed by man, due to man being given free will. However, this argument has some extreme weaknesses. Not only does it do nothing to play down the existence of natural evil, it also creates an inconsistency with the axiom of omnipotence. Even if evil is a creation of man, the free will defence does nothing to explain why God does not intervene; omnipotence implies the will to help others no matter what; even if their predicament is their own fault.

A second form of the problem of evil is called the argument from natural disasters: an expansion of natural evil. Plagues, tsunamis, earthquakes,
Volcanic eruptions and famine are all very much part of the world's makeup; as a result, their observable existence and impact pose a problem to the concept of an omnibenevolent, omnipotent and omniscient creator. The most common rebuttal to this claim is that these events are punishment for the sins of humanity. However, this resort is flawed; not only would these things be extremely crude instruments of retribution, but the notion of a God with such an emphasis on retribution contradicts that of an omnibenevolent one. Furthermore, if God were willing to go to such extremes, then to physically reveal himself to the world would be a far superior course of action, or there are few who would disobey the Christian ethical codes if they had tangible proof of God's existence.

It is also important to note that natural disasters would kill even the devout, making them an extremely inaccurate method of punishment.

Another version of the problem of evil is the argument from imperfection. Just as the perfect benevolent watchmaker would make the perfect watch for his clients, so too would a perfect benevolent creator make the perfect world for its denizens. However, the world is not perfect; therefore, the argument claims, Christianity...
There are two common objections to this claim. The first argument attacks the idea of a perfect world, claiming that such a thing is impossible to conceive and therefore impossible to create. However, this has 3 major problems. Firstly, if God can't create it, he cannot be omnipotent. Secondly, if a perfect world is impossible to conceive and exist, the same could be said of God. Finally, the world being imperfect is sufficient for the argument; the perfect world needs not be defined. The second argument against the argument from imperfection is that the imperfection is a punishment for original sin. However, this defence is quite weak; not only is it inconsistent with omnipotence, but it also affects those who have not sinned, rendering it an unusual form of punishment for a perfect being.

In conclusion, it would seem that, while objections exist and the argument is far from absolute, the problem of evil remains strong, a testament to critical thinking and the philosophy of the ages.