AQA

AS
Religious Studies

RSS04 Religion, Philosophy and Science
Mark scheme

2060
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Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

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Examination Levels of Response

Religious Studies (Advanced Subsidiary) AS Level Descriptors

Level	**AS Descriptor AO1**	Marks	**AS Descriptor AO2**	Marks	**AS Descriptors for Quality of Written Communication in AO1 and AO2**
7	A thorough treatment of the topic within the time available. Information is accurate and relevant, and good understanding is demonstrated through use of appropriate evidence / examples	**28-30**	A well-focused, reasoned response to the issues raised. Different views are clearly explained with supporting evidence and argument. There is some critical analysis. An appropriate evaluation is supported by reasoned argument.	**14-15**	Appropriate form and style of writing; clear and coherent organisation of information; appropriate and accurate use of specialist vocabulary; good legibility; high level of accuracy in spelling punctuation and grammar.
6	A fairly thorough treatment within the time available; information is mostly accurate and relevant. Understanding is demonstrated through the use of appropriate evidence / example(s)	**24-27**	A mostly relevant, reasoned response to the issues raised. Different views are explained with some supporting evidence and argument. There is some analysis. An evaluation is made which is consistent with some of the reasoning.	**12-13**	
5	A satisfactory treatment of the topic within the time available. Key ideas and facts are included, with some development, showing reasonable understanding through use of relevant evidence / example(s).	**20-23**	A partially successful attempt to sustain a reasoned argument. Some attempt at analysis or comment and recognition of more than one point of view. Ideas adequately explained.	**10-11**	Mainly appropriate form and style of writing; some of the information is organised clearly and coherently; there may be some appropriate and accurate use of specialist vocabulary; satisfactory legibility and level of accuracy in spelling, punctuation and grammar.
4	A generally satisfactory treatment of the topic within the time available. Key ideas and facts are included, showing some understanding and coherence.	**15-19**	A limited attempt to sustain an argument, which may be one-sided or show little ability to see more than one point of view. Most ideas are explained.	**7-9**	Form and style of writing appropriate in some respects; some clarity and coherence in organisation; there may be some appropriate and accurate use of specialist vocabulary; legibility and level of accuracy in spelling, punctuation and grammar adequate to convey meaning.
3	A summary of key points. Limited in depth or breadth. Answer may show limited understanding and limited relevance. Some coherence.	**10-14**	A basic attempt to justify a point of view relevant to the question. Some explanation of ideas and coherence.	**5-6**	
2	A superficial outline account, with little relevant material and slight signs of partial understanding, or an informed answer that misses the point of the question.	**5-9**	A superficial response to the question with some attempt at reasoning.	**3-4**	Little clarity and organisation; little appropriate and accurate use of specialist vocabulary; legibility and level of accuracy in spelling, punctuation and grammar barely adequate to make meaning clear.
1	Isolated elements of partly accurate information little related to the question.	**1-4**	A few basic points, with no supporting argument or justification.	**1-2**	
0	Nothing of relevance.	**0**	No attempt to engage with the question or nothing of relevance.	**0**	

RSS04: Religion, Philosophy and Science

Indicative content

Note: This content is indicative rather than prescriptive and students are not obliged to refer to all the material contained in this mark scheme. Any legitimate answer will be assessed on its merits according to the generic levels of response.

Question 1 Miracles

0 1 Explain why both scientists and religious people might reject miracles.

Scientific rejection

- The scientific viewpoint does not accept miracles, because by most people's definition, miracles are events that lie outside the laws of nature.
- If miracles are events outside the laws of nature, then if an event appears to violate a law of nature, then it cannot be a law of nature; so it is impossible for a real law of nature to be violated; so no event can be a miracle.
- Miracles are usually held to be unique instances of God acting in the world, but science deals with events that are predictable and repeatable.
- The scientific method reduces God's activity to the 'gaps'.
- Science can provide natural explanations for some miracles.

Religious rejection

Maurice Wiles has a number of arguments against miracles, eg:

- The whole world is a single act of God, so God would not undermine the natural laws he created by performing miracles.
- Some miracles are trivial, such as Jesus turning water into wine. To perform trivial miracles but ignore the Holocaust would not be the act of a benevolent God.

Further religious arguments:

- A timeless metaphysical God would (allegedly) not be able to intervene within the space-time universe.
- Miracles are naturally selective, so a God who cures one person of a disease but ignores the equal claims of another would be acting immorally.
- To regard miracles as specific acts of God is to undermine the idea that God acts throughout creation as a whole.
- For God to intervene in the universe implies that creation is somehow less than perfect, or that God has made a mistake etc.

Maximum Level 5 if only one part addressed.

NB Reference to Wiles is likely, but there is no requirement for students to refer to Wiles or to any other particular scholar in order to achieve maximum marks.

HUME: Candidates are likely to use Hume as a part of 'scientific rejection' which is acceptable in terms of Hume's comments on the following:

1. The principle of induction, and Hume's main inductive argument is that it is always more likely that the witnesses are mistaken or lying than that a miracle has occurred.
2. Hume's empiricism: comments about (scientific) evidence.

3. Hume's comments on (miracles) and the laws of nature.
4. Accounts of miracles in different religions count each other out.
5. The origin of testimony about miracles, in 'barbarous' nations
6. The desire to believe.

Credit also comments about the placebo effect and miracles.

[30 marks] AO1

0 2 **'Miracles can happen.'**

Assess this claim.

In support

- The amount of testimony from scripture is large, so miracles probably do happen.
- God's miraculous intervention in history is the foundation of some religions, so miracles can and do happen.
- Miracles attested at pilgrimage centres such as Lourdes.
- An all-loving and all-powerful God would be both willing and able to intervene miraculously.
- Theists believe that God answers prayer through miracles
- Objections that a timeless God cannot act in space-time do not work. Aquinas held that God acted timelessly at the point of creation to place miracles at points in history.
- Many theologians argue that God is immanent as well as transcendent, so there is no bar on his ability to intervene.

Other views

- For those who take a Humean definition that miracles are events of religious significance that violate natural laws through a particular volition of a deity or the interposition of some invisible agent, then miracles cannot happen: Hume's inductive argument holds that it is always more likely that the witnesses are lying or mistaken than that a miracle has occurred. His secondary arguments miracles hold that they are the product 'ignorant and barbarous nations' or their equally barbarous descendants; that people are naturally credulous; that miracle stories in different religions cancel each other out, and so on.
- Hume does not deny that miracles can happen: he simply points out that their inductive probability is close to zero, etc.

[15 marks] AO2

Question 2 Creation

0 3 Explain:

- **six-day (young earth) creationism**
- **the theory of intelligent design.**

Six-day (young earth) creationism

Students might refer to some of the following:

- While scientific evidence shows that the age of the universe is around 13.8 billion years, and that of the earth is around 4.5 billion years, YEC holds that the earth is much younger, and was created by God between 5,700 and 10,000 years ago.
- YEC follows a particular literal reading of Genesis in which God created the earth in six 24-hour days. All humans descend from Adam and Eve; there was no death before the Fall, and species were created 'as seen' by God and not produced through the evolution of species.
- This interpretation is defended eg by Henry Morris, who wrote a series of books in the 20th century. promoting what he called 'creation science'.
- Ken Ham dates the Flood at 2348 BC, argues that the ark carried enough species for biodiversity, that dinosaurs co-existed with genetically modern humans, that radiometric and other scientific methods of dating the earth are wrong, and that the only evidence that counts is the one who was there – that of God.

NB there is no requirement for students to refer to any named scholar.

The Theory of Intelligent Design

Students might refer to some of the following:

- ID argues that certain features of the universe and of living things are best explained by an intelligent cause rather than by an undirected process such as natural selection.
- ID generally does not identify the designer, although some ID proponents equate the designer with the Christian God.
- Michael Behe claims that many biological systems are 'irreducibly complex' at the molecular level, so that the removal of any one part of the system would make it stop working. Behe holds that this challenges Darwinian evolution because irreducible complexity cannot be produced by successive modifications.
- ID is a version of the teleological argument, and is sometimes compared to Paley-type arguments.

Maximum Level 5 if only one part explained.

[30 marks] AO1

0 4 **'The theory of intelligent design is neither scientific nor religious.'**

How far do you agree?

In support

- Most scientists reject ID as pseudoscience. Moreover its main ideas are not testable, whereas a scientific theory is testable.
- ID insists that some structures show evidence of design by a supernatural intelligence, and that structures like the eye cannot be produced by small gradual steps. Biologists / evolutionists argue that ID theorists ignore the evidence.
- Most evolutionists omit all mention of 'design' in their accounts of the evolution of species in favour of blind natural causes.
- ID is not particularly religious, since it generally does not identify the designer in an overtly religious sense. Most religions are **overtly** religious.
- Religion works by faith; ID appears to understand faith in a different way to most believers. For example ID says nothing about whether or not humans should have a relationship with the creator. Nor does it require 'belief in' God, or worship, for example.
- ID has no liturgy, no clergy, or forms of public worship, no scriptures, no associated rituals, and no sacred institutions – in fact none of the usual paraphernalia of religion.

Other views

- ID does have a religious agenda, since many of its adherents identify the designer as the Christian God.
- Where ID is not Christian, it still has a religious approach, since belief in a designer is the hallmark of the teleological argument for the existence of God.
- ID is seen as the 'respectable' side of creationism: it began as an attempt to make creationist theories more respectable scientifically.
- Scientifically, it does have the broad support of those who accept the Anthropic Principle that the emergence of consciousness was the design of an intelligent creator.
- Some mainstream religions mix religion and science, so ID's attempt to do so is scientific to a point.
- All design arguments refer to science, so ID must be scientific.

Accept that Swinburne's anthropic principle can be used in supporting Intelligent Design.

[15 marks] AO2

Question 3 The design argument

0 5 Explain Paley's design argument and explain why Dawkins rejects design arguments.

Paley

- If I walk across a heath and come across a stone, I can suppose that it just happens to be there.
- The same supposition could not be made about a watch, because it shows evidence of design (eg use of non-rusting metals, a transparent face, craftsmanship, beauty, etc). The watch is clearly an artefact designed and built by a craftsman.
- Seeing the watch leads me to infer the existence of a watch-maker, despite the fact that I have not seen him, and even if I can't understand parts of the mechanism, or if it is broken – I know it was designed.
- If I look at the universe, it too appears to have been designed. For example (1) living things are clearly designed for a purpose, eg birds (with hollow bones etc) are designed to fly; fish (with gills, fins & tail) are designed to operate in an aquatic environment; (2) the movement of sun, moon and stars shows complete regularity. Paley thus argues from both **purpose** and **regularity**. So by analogy, from the appearance of design in the universe I can infer the existence of the unseen designer – God.

Dawkins

- Dawkins' book 'The Blind Watchmaker' is a specific rejection of Paley-type arguments, since its purpose is to argue that if there is a watchmaker who is responsible for designing the universe, the watchmaker is blind, since the processes of evolution are blind and are not directed. There is no purpose and there is no plan.
- Dawkins therefore champions Darwinian evolutionary theory over against design.
- In 'The Selfish Gene', Dawkins proposed that evolution is gene-centred. It is DNA that gives the blueprint for people, not God. Human beings (and virtually everything about them) are no more than 'carriers' for genes.
- God, then, did not design humans any more than he designed other living things. Living things have evolved through the activity of DNA. Humans are merely what have evolved recently.
- Some might refer to Dawkins' ideas about memes – humans replicate ideas in the Darwinian sense by copying ideas and behaviour.
- Some might refer to 'Viruses of the Mind', where Dawkins uses the idea of memes to explain other religious aspects of religious belief.

Maximum Level 5 if only one part explained.

[30 marks] AO1

0 6 **'Paley was right about the design argument.'**

How far do you agree?

In support

- Paley's argument is very simple, and its very simplicity appeals: wherever we look we see evidence for design / the appearance of design.
- Dawkins counters Paley by appealing to evolution as an entirely natural process, but this does not answer Paley's claim that God is required to explain the appearance of design in everything that we see. Dawkins apparently believes that evolution explains all the necessary facts about species, for example, but as Swinburne points out, evolution 'explains' absolutely nothing: it is subject to the absolute laws of biology, genetics, chemistry, etc, and is merely a process, not an explanation.
- By contrast, Paley points out what seems obvious to most people: that no matter how deeply we look at the universe, it obeys absolute natural laws. That fact is not self-explanatory, so to suppose that they are the work of a law-maker, God, is a reasonable idea.

Other views

- Paley is clearly wrong in what he says about fish and birds being designed to fit their environment: they are merely what have evolved in an aquatic and atmospheric environment.
- Paley's watch analogy compares the universe with a mechanism (the watch), but Hume argues that the universe is more like a giant vegetable, and vegetables reproduce themselves.
- Paley also assumes that the designer of the universe must be (the Christian) God, but this idea was challenged eg by Hume.
- Dawkins argues in particular that if we look closely at the universe, we do not see a God of love: all we see is 'blind, pitiless indifference'. The problem of evil is certainly a major challenge to the idea of a benevolent designer.
- Some might argue in favour of alternative versions of the design argument, eg Swinburne's probability argument, or the Anthropic Principle (the 'fine tuning' argument).

[15 marks] **AO2**

Question 4 Quantum mechanics and a religious world view

0 7 Explain the key ideas in quantum mechanics, with particular reference to:

- **light as a wave and a particle**
- **the role of the observer in resolving uncertainty.**

Light as a wave and a particle

- Light has both wave-like and particle-like properties. Matter also has wave-like properties (predicted by de Broglie in 1924).
- Wave–particle duality shows that neither the classical concept of particles nor of wave can fully describe the behaviour of quantum-scale objects, either photons or matter.
- Like position and momentum, wave-particle duality is an example of the principle of complementarity: complementary properties cannot be measured accurately at the same time: according to Heisenberg's 'uncertainty principle' the more accurately one property is measured, the less accurately the complementary property is measured.
- The double-slit experiment is an example of wave-particle duality: the quantum particle acts as a wave when passing through the double slits, but as a particle when it is detected.
- The quantum state of a system of one or more particles contains all the information about the system, and is known as its wave function. The Schrödinger equation determines how the wave function evolves over time. The wave is in a mathematical space, not a physical space.

The role of the observer in resolving uncertainty

- Wave function collapse is the process by which wave function, which initially is in a superposition of different 'eigenstates' – appears to reduce to a single one of the states after interaction with an observer.
- In some interpretations of QM, then, it is consciousness/the observer that collapses the wave function, which makes consciousness crucial in considering 'reality'.
- In the double-slit experiment, the observer collapses the wave function – the act of observation makes the wave appear as a particle. In some religious interpretations of QM, God is seen as the ultimate observer whose observation of all states of the universe collapses its wave function so that it appears 'real' when observed in the past (eg observing distant galaxies through telescopes).

Other key ideas

Students may describe the key principles of QM by describing the wave-particle duality of light and the role of the observer. Others will add further key categories, but **note** when marking that the categories in this question are not completely separate aspects of quantum mechanics, so allow for much broader treatment.

Separate mention might be made, for example, of:

- Quanta
- The nature of an electron
- Schrödinger's Cat
- The Copenhagen Interpretation (the observer effect in QM indicates that the quantum wave-function collapses when observed by mind(s). This is a consequence of the traditional Copenhagen interpretation of QM).
- Quantum entanglement
- Quantum field theory, etc.

Maximum Level 5 if only one part explained.

[30 marks] AO1

0 8 **'Quantum mechanics shows that we cannot be certain about God or about science.'**

Assess this claim.

In support

- According to some interpretations of QM, certainty about science disappeared when at the end of the 19th century science discovered phenomena in both the macro (large) and the micro (small) worlds that classical physics could not explain.
- Physicists like Feynman suggested that QM deals with physics as she **is** – ie physics is 'absurd', eg Heisenberg's 'uncertainty principle' seems to show that uncertainty is at the heart of the micro-world.
- Classical physics is deterministic, whereas some interpretations of QM imply that indeterminism and uncertainty is at the heart of reality. At best, we can predict on probabilities about future events, and not certainties.
- The 'many worlds' interpretation of QM suggests that all possible universes exist, although they cannot communicate with each other.
- Certainty about God is problematic on any interpretation, but in QM, the role of conscious observers (and therefore of God as the cosmic observer) is not central in some interpretations, eg quantum decoherence, in which (for example) the stream of information coming from the Big Bang is enough on its own to collapse the wave function.

Other views

- The statement depends on which interpretation of QM is taken. Some interpretations (eg the 'many worlds' view) restore determinism, which is at the root of classical physics, so this further restores determinism and predictability in science.
- Some might argue that certainty in science can never be achieved, since a 'theory of everything' is still not visible, so we might have to make do with what we can discover about the laws of physics/nature, and that is good enough to guide human life.
- For God, the argument that 'mind' is central to reality is a strong one, again depending on the view taken of QM. If an observer checks to see if a nucleus has decayed (eg by using a Geiger counter), she must get a definite 'yes' or 'no' answer, so 'the quantum mechanical description is in terms of knowledge, and knowledge requires somebody who knows.' (Peierls) – not a purely physical thing, but a mind.
- Many answers are likely to focus on issues like faith, for example that faith is not about certainty, but is about trust in the existence of a God who interacts with creation.
- Faith often brings certainty where science cannot, which is the argument of reformed epistemology: for example a religious experience might bring certainty about God, etc.

[15 marks] AO2