

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**Advanced Extension Award**

**CRITICAL THINKING**

**9913**

SPECIMEN PAPER

3 hours

Additional materials:  
Answer booklet  
Booklet – documents 1-4  
Booklet – documents 5-7

**TIME** 3 hours

**INSTRUCTIONS TO CANDIDATES**

- Write your name, Centre number and candidate number in the spaces provided in the answer booklet.
- There are three sections to this paper. Answer **all** questions.
- Write **all** your answers **including Section A Multiple Choice** in the answer booklet.
- Read each section carefully and make sure that you know what you have to do before starting your answer.
- You are advised to **spend about 30 minutes reading Documents 5 to 7** before you begin to answer Section C.

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is 65.

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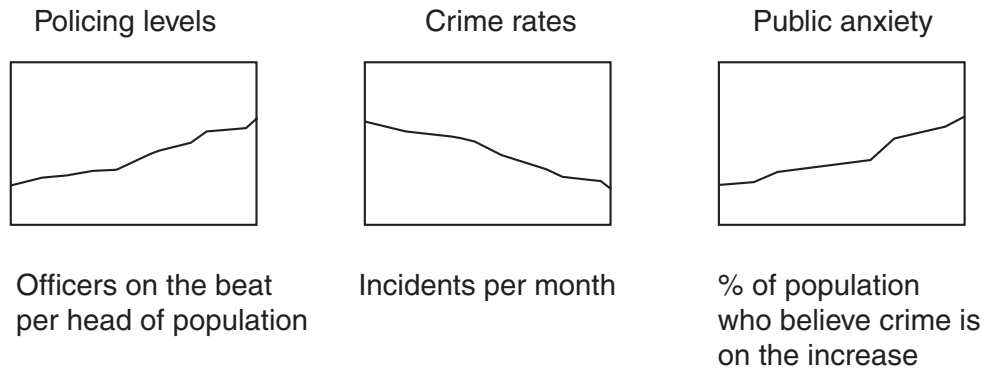
**This question paper consists of 13 printed pages and 3 blank pages.**

## Section A

Answer **all** questions in this section of the paper.

For each question there are five possible answers, **A, B, C, D** and **E**.

Choose the **one** you consider correct and **record the letter of your choice in the answer booklet**.



- 1 Which **one** of the following can be inferred from the above data?
- A** Having more police on the streets has reduced crime but at the same time fuelled public anxiety.
  - B** The correlation between policing levels and crime rates has not led to a reduction in public anxiety about crime.
  - C** Higher numbers of police on the streets has had the effect of raising public anxiety, even though crime rates have fallen.
  - D** The public are not convinced by statistics when it comes to emotional issues such as crime.
  - E** The police are naturally more concerned with fighting real crime than allaying public anxieties.

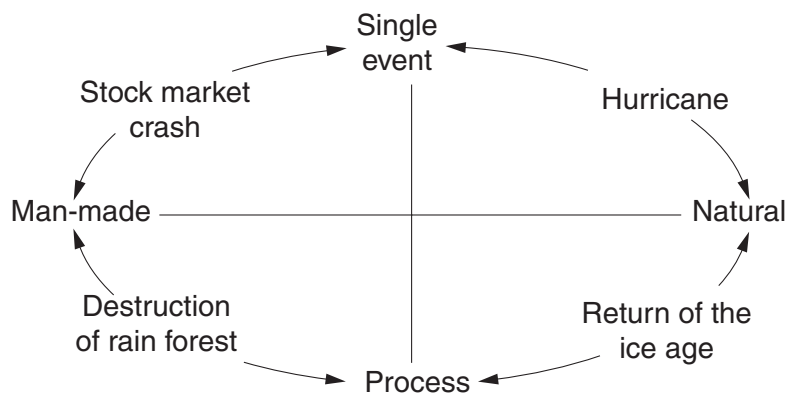
[1]

- 2 (a) There has been growing concern about the risk of the Earth being struck by an asteroid. In particular, scientists are worried about an asteroid detected in 1997, known as 1997 XF11. The probability of this or another asteroid hitting the Earth before the end of the present century was once put at 1500 to 1. However, scientists have recently re-assessed this risk and now put the probability at 5000 to 1. Nevertheless, these are still higher odds than the risk to the individual of dying in a rail accident (1 in 20,000) or the risk of being struck by lightning (1 in 10 million). If such an impact occurred there would be massive loss of life. Therefore, the probability of death through asteroid impact is greater than the risk of death through a rail accident or being struck by lightning.

Which **one** of the following is the best statement of the flaw in the above argument?

- A Scientific knowledge about asteroids and how to deflect them will increase.
  - B The conditions determining a risk of asteroid impact are not fully known.
  - C One cannot compare a risk to the planet with a risk to the individual.
  - D The frequency of asteroid impact is far less than rail accidents or lightning strikes.
  - E It assumes that the Earth will be struck by an asteroid before the end of the 21st century.
- [1]

- (b) One way of looking at risk is suggested in the diagram below.



Using the information above, decide which **one** of the following is most closely parallel to the risk posed by asteroid impact.

- A The risk from 'superbugs' which are resistant to antibiotics
  - B The risk from international terrorist suicide plane hi-jacks
  - C The risk of dangerous radiation due to the depletion of the ozone layer
  - D The risk of a volcanic explosion causing a tidal wave
  - E The risk of nuclear explosion due to an accident in a nuclear power station
- [1]

- 3 Many scientists and philosophers now accept that the world (by which they mean the universe) is just one of many possible worlds which exist in some unobserved but nonetheless real way. They have good grounds, for if this were the only possible world, our descriptions of it – e.g. scientific observations – would be meaningless. A meaningful description has to identify what is *special* about the thing being described, and that necessitates the existence of other things that are similar in one or more ways but different in one or more others. If the only thing that existed was a left-handed glove, it would mean nothing to say it was left-handed, as that would not make it special. The very fact that we can and do meaningfully describe our world requires that other, different worlds exist, at least in the realm of possibility. They may even be as real as the one we call ‘ours’.

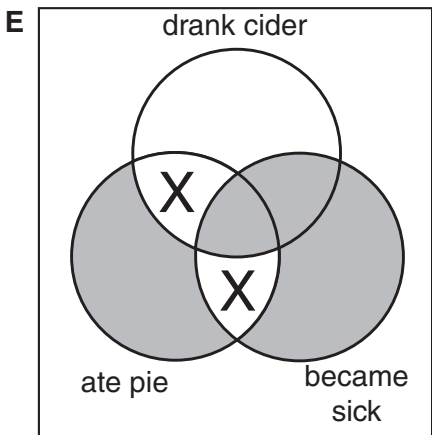
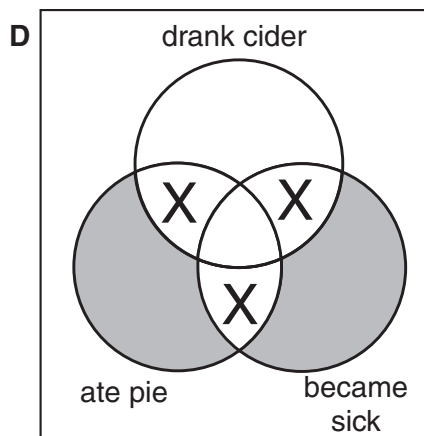
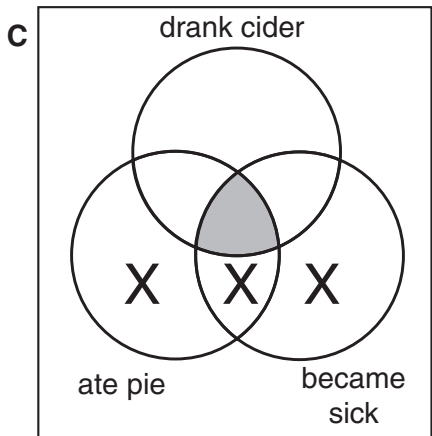
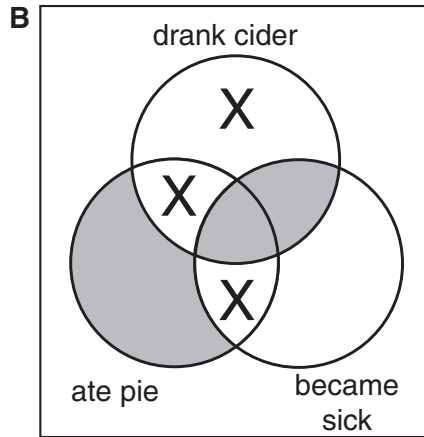
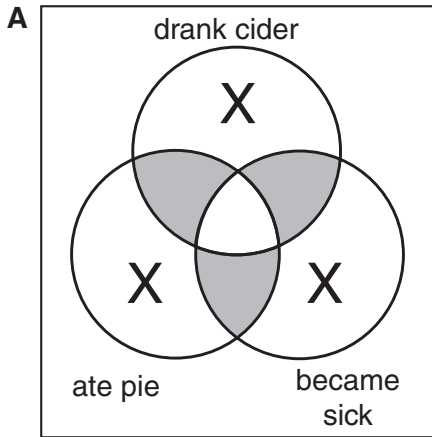
Which **one** of the following supports the above argument?

- A The description of a square as having four equal sides set at right-angles is meaningful, even though no other kind of square is possible.
- B The description of a square as having four equal sides set at right angles would be meaningless if squares were the only possible polygons.
- C The description of a something as ‘a five-sided square’ is not meaningless, it is simply a description of something unreal.
- D It is true by definition to describe a square as having four equal sides set at right angles.
- E Things that are neither real nor possible, such as five-sided squares, can exist only in the imagination.

[1]

- 4 A number of cases of food poisoning were recorded after a mediaeval-style banquet at which rabbit pie and cider were among the items consumed. Only the guests who ate the pie became sick, and all of these were sick except, surprisingly, those who had cider to drink, leading the examining doctor to speculate that the cider may have contained an antidote.

Which **one** of the following Venn diagrams correctly represents the information on which the doctor based his speculation?



Key

- no guests
- one or more guests
- no available information

[1]

5 Living under power lines carries all sorts of health risks. A headline-grabbing finding from the National Radiological Protection Board (NRPB) has concluded that exposure to magnetic fields produced by the overhead power lines doubles the chances of a child developing childhood leukaemia. But the headline obscures the importance of other health risks. It has been claimed that each year, in the UK, in addition to 8 cases of childhood leukaemia, power lines cause 14 cases of skin cancer, up to 400 cases of lung cancer, many thousand cases of illnesses associated with air pollution (such as respiratory disease, allergies, and aggravated asthma), 9000 cases of depression, and 60 suicides. The majority of these cases are caused, not by the magnetic effects examined by the NRPB, but by the electrical effects of the power lines. These figures are comparable to the number of people killed each year on the roads. This is not to say that people living under power lines should panic: after all, the level of the road-accident rate doesn't make motorists panic into not using their cars. But what the figures do show is that electricity companies should look at ways of dealing with the problem. They should site power lines away from places where people live, ensure that no new homes are built near them, or should bury the lines.

(a) Which **one** of the following pieces of evidence would be **least** relevant in evaluating the link between ill-health and overhead power lines?

- A The rate of depression amongst those who do not live near power lines.
- B The degree of success in treating lung cancer in those who live near power lines.
- C The income levels of those who live near power lines.
- D The rate of illness amongst those who live near buried power lines.
- E The proportion of those living near overhead power lines who smoke. [1]

(b) Which **one** of the following pieces of information would be **most** relevant in evaluating the author's comparison between the health risks of overhead power lines and the road-accident fatality rate?

- A The number of road accidents each year.
- B The proportion of road accidents that are fatal.
- C The number of people who live under power lines.
- D The annual number of road accidents in countries other than the UK.
- E The number of people who die each year from causes not attributable to power lines. [1]

(c) Melatonin, a regulator of mood, is produced by the pineal gland during the night. The operation of the pineal gland can be affected by magnetic fields. Given this evidence, which **one** of the following would be **most** relevant in evaluating the evidence on ill-health and power lines?

- A The sickness rate of workers who maintain overhead power lines
- B The suicide rate of those who suffer from depression
- C The sleep patterns of those who suffer from depression
- D The working hours of those who live near overhead power lines
- E The levels of melatonin in those suffering from depression [1]

- 6 The Intergovernmental Panel on Climate Change (IPCC) predicts crop failures, water shortages, increased disease, landslides, and sea surges as a result of a 5.8 °C increase in global temperatures by 2100. However, this overall prediction is based on a number of dubious individual assumptions. For example, the IPCC claims that we're going to use more and more fossil fuels (especially oil) through the 21st century. This claim does not fit well with the evidence that renewable energy resources (such as solar power) have fallen in price by 50% per decade over the past three decades. Furthermore, computer models show that these renewable resources will be cheaper than fossil fuels by 2050. As a result, there is much more likely to be an increase in global temperature of 2.5 °C. In consequence, we should reject the IPCC predictions and acknowledge that the future of the planet is much more secure than the Panel claims.

The author of the above passage would be inconsistent in their argument if they accepted which **one** of the following claims?

- A The IPCC is wrong to believe that past trends are a reliable guide to the future.
- B The IPCC has taken the worst-case scenario as the most likely scenario.
- C An increase in carbon dioxide as a result of an increase in global temperature would benefit agriculture.
- D The IPCC used computer models of rising sea levels to show the effects of an increase in global temperature.
- E An increase in global temperature of only 2.5 °C will cause increases in sea levels. [1]

- 7 There has been a lot of published evidence to show that 'spiritual' healing has an effect upon patients who receive it (and relatively little to show the opposite). For example, there is evidence that 'distance healing', in which there might be hundreds of miles between the patient and the healer, produces improvements in the patient's condition. In another study, heart patients who had been prayed for (even if they didn't know they were being prayed for) suffered 10 per cent fewer complications than those who hadn't been prayed for. Thus the evidence does seem to be showing that 'spiritual' healing produces useful results. However, it needs to be considered whether medical journals would want to publish studies which showed no effect of such healing, because such evidence is assumed to be the norm. We can see the imbalance between the reporting of positive and negative results in this way.

Which **one** of the following uses a similar argument to the one in the above passage to explain the nature of the evidence available?

- A There is little evidence for the existence of the Loch Ness monster because the scientific establishment assumes that it doesn't exist.
- B Since virtually all cosmologists believe that the universe is expanding, evidence which would suggest that it isn't would have to be explained as having been wrongly interpreted.
- C The evidence for the theory of evolution is incomplete because the fossil record has not yet been fully uncovered.
- D Evidence on the value of complementary medicine is being taken increasingly seriously because of the interest being shown in it by the medical profession.
- E In that extra-sensory perception is assumed by most scientists not to be possible, few studies are ever carried out to prove that it isn't, despite the large number which seem to show it is. [1]

## 8 Liquid Space

Newton was convinced that space was some kind of substance. He noted that any body rotating in a vacuum – a planet spinning in space, for example – experiences a centrifugal force. The Earth bulges slightly at the equator as a result. But truly empty space has no landmarks against which to gauge rotation. So, thought Newton, there must be something invisible lurking there to provide a frame of reference. This something, reacting back on the rotating body, creates the centrifugal force.

The 17th century German philosopher Gottfried Leibniz disagreed. He believed that all motion is relative, so rotation can be gauged only by reference to distant matter in the Universe. We know the Earth is spinning because we see the stars go round. Take away the rest of the Universe, Leibniz said, and there would be no way to tell if the Earth was rotating, and hence no centrifugal force.

[Paul Davies, writing in the *New Scientist*, 3.11.01: article entitled *Liquid Space*.]

Judging from the passage, which **one** of the following premises would Leibniz and Newton seem most likely to agree on?

- A That centrifugal force cannot be explained by an object's rotation alone.
- B That other stars and other planets are needed to explain the Earth's centrifugal forces.
- C That an object has motion only in relation to other bodies in space.
- D That there is no such thing as a complete vacuum.
- E That forces are the effects of bodies acting and reacting on each other. [1]



- 9 (a) A tutor made the following prediction to a group of his students:

'If you haven't read the book by Dr Donstein, you won't pass the exam.'

Which **one** of the following would have to be true if the prediction was correct?

- A All those who read the book passed the exam.
- B All those who had not read the book failed the exam.
- C The same number of students read the book as passed the exam.
- D Only those who passed the exam had read the book.
- E None of those who failed the exam had read the book.

[1]

- (b) To test his prediction the same tutor asked the students to answer two questions:

Q1. Have you read the book?

Q2. Did you pass the exam?

Four of the students missed out one of the questions. Their responses were:

	Q1	Q2
Tim	Yes	—
Li	No	—
Sarah	—	Yes
Asha	—	No

Which responses **must** be completed in order to test the tutor's prediction:

- A Tim's only.
- B Tim's and Sarah's.
- C Tim's and Asha's.
- D Li's and Sarah's.
- E Li's only.

[1]

(c) Which **one** of the following corresponds exactly with the tutor's prediction?

**A**

X		predicted pass in the exam
		YES
		NO

YES    NO  
has read book

**B**

		predicted pass in the exam
		YES
		NO

YES    NO  
has read book

**C**

		predicted pass in the exam
		YES
		NO

YES    NO  
has read book

**D**

X		predicted pass in the exam
		YES
X	X	NO

YES    NO  
has read book

**E**

X		predicted pass in the exam
		YES
	X	NO

YES    NO  
has read book

Key

- no students
- one or more students
- no information

[1]

- 10 An argument presents reasons for accepting *that* such-and-such is or should be the case. In this sense it differs from an explanation which simply states *why* such-and-such is the case.

Under this definition, which **one** of the following is an argument?

- A** Satire, more than most forms of entertainment, dates very quickly, with old favourites quickly becoming tame and inoffensive by present day standards. This is mainly because comedians in general, and satirists in particular are always looking for new ways to shock or offend – and finding them.
- B** In contrast with libel, which rests on truth or falsity, it is very difficult to determine precisely when a comedian or satirist has gone too far. Hence the rarity with which prosecutions against satirical attacks succeed.
- C** From the day it was opened the Millennium Bridge began to rock and sway when people crossed in any number. Engineers have not yet been able to find and cure the fault. It is therefore still closed to the public two years after it was built.
- D** Once a bridge has been built it can be very difficult to find and remedy faults, as the Millennium Bridge – still closed two years after completion – has demonstrated. Therefore, more research into the effects of vibration in bridges is necessary at the design stage.
- E** The bridge rocked and swayed alarmingly when it was first opened to the public. This was because their random footsteps set up an unexpectedly high level of vibration in the bridge's structure. [1]

TOTAL: [15]

**Section B**

Answer **all** questions in this section of the paper.

You will **need to use** Documents 1, 2, 3 & 4 to answer the questions in this section.

Consider the *Spectator* cartoon in **Document 1**.

- 1 Given that humour often arises from a misinterpretation of meaning  
e.g. What do you give a man who has everything? Answer – antibiotics.

**Explain the source of humour in the cartoon.** [2]

Consider the argument about American fast-food chains in **Document 2**.

- 2 (a) (i) **Identify the weakness of the reply** to the editor of the Good Restaurant Guide. [2]

(ii) **Construct an alternative reply** that would counter the editor's objection. [2]

(b) The argument seeks to reply to environmental objections to fast-food outlets.

- **Identify the replies.**
- **Assess the reasoning.**
- **Suggest additional evidence** to support the reasoning. [6]

(c) The author attempts to offer the positive advantages of fast-food chains to support the conclusion.

- **Identify the conclusion and the reasoning** that supports it.
- **Identify the weaknesses** in the reasoning.
- **Construct a brief additional argument** that would support the conclusion. [6]

Consider the views raised in the *Woman's Own* article in **Document 3**  
and the additional evidence provided by the food wrappers in **Document 4**.

- 3 Use these documents as a starting point to:

**Construct a reasoned argument** that justifies  
**either** accepting **or** rejecting  
the policy at Southfield Infants' School regarding packed lunches. [12]

TOTAL: [30]

**Section C**

You will **need to use** Documents 5, 6 & 7 to answer this question.

You are **advised to spend about 30 minutes reading these.**

You have been given three documents which consider the Internet from different perspectives. Use an evaluation of the evidence and issues raised in these documents to help you to:

**Construct a REASONED CASE to persuade the government that there should be regulation of the Internet.**

TOTAL: [20]





