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Answer ALL questions in Sections A and B, and ONE question from Section C.

SECTION A

You are advised to spend no more than 20 minutes on this section.

1. Give **two** characteristic features of scientific revolutions.

1 _____

2 _____

Q1

(Total 2 marks)

2. Identify a significant scientific theory or discovery associated with **one** of the following.

Put a cross in the box indicating the scientist you have chosen (☒). If you change your mind about a question, put a line through the box (☒) and then indicate your new question with a cross (☒).

- | | | | |
|-----------------------|---|----------------------|---|
| • Isaac Newton | ☒ | • Albert Einstein | ☒ |
| • Nicholas Copernicus | ☒ | • Harry Kroto | ☒ |
| • William Harvey | ☒ | • J Watson & F Crick | ☒ |
| • Charles Darwin | ☒ | • Edwin Hubble | ☒ |
| • Dorothy Hodgkin | ☒ | • Marie Curie | ☒ |
| • Jane Goodall | ☒ | • Ernest Rutherford | ☒ |

Scientific theory or discovery: _____

Q2

(Total 2 marks)



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3. Medical researchers often carry out 'double blind' trials of new drugs. Half of the trial group of patients are treated with the drug, the other half of the trial group are treated with a dummy tablet (called a 'placebo'). It is very important that the patient, their doctor, and the researcher do not know which treatment a patient is receiving.

(a) Explain briefly why this 'double blind' procedure is used.

(3)

(b) Briefly describe **one** ethical issue that might arise from such a trial.

(2)

Q3

(Total 5 marks)



4. An American study showed that people living near noisy main roads had fewer friends than those in quiet suburbs.

(a) Suggest an explanation for this finding.

(1)

(b) Suggest **briefly** how you would test your explanation **scientifically**.

(3)

(Total 4 marks)

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Q4



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5. A pair of hedgehogs is released on an island that has no hedgehogs.

Assume that:

- a breeding pair of hedgehogs produces two more breeding pairs of hedgehogs a year
- a hedgehog takes one year to become reproductively mature
- hedgehogs live for at least five years
- there is ample food for the hedgehogs during this time

(a) Predict how many hedgehogs will inhabit the island at the end of two years. Show how you worked this out.

(2)

(b) Why are such predictions very significant for biology?

(2)

Q5

(Total 4 marks)

TOTAL FOR SECTION A: 17 MARKS



N 2 3 0 3 4 A 0 5 1 2

SECTION B

Read Source 1 on the separate insert and answer the following questions.

For Question 6 parts (c)(i) and (d)(ii), choose an answer A, B, C or D and put a cross in the box (☒). If you change your mind, put a line through the box (☒) and then put a cross in another box (☒).

6. (a) Write out **one** example from the article of an analogy.

(1)

(b) Write out **two** pieces of objective evidence that show trains are wasteful of energy compared to other forms of transport.

1 _____

2 _____

(2)

(c) (i) Which statement represents the best **conclusion** drawn from Source 1?

- A Cars consume less fuel per seat than trains. ☒
 - B The environmental lobby needs to reconsider its case. ☒
 - C Long distance rail travel is the least energy-efficient form of transport in Britain. ☒
 - D Walking, cycling or taking a train is best for our planet. ☒
- (1)

(ii) Justify your choice.

(2)



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(d) Norman Baker's argument, in paragraph 2, includes the following points:

- A Using more fuel increases carbon emissions.
- B Cutting fuel prices increases the use of fuel.
- C Cutting fuel prices worsens climate change.
- D Carbon emissions worsen climate change.

(i) What form of argument is Norman Baker using?

(1)

(ii) Which point represents the conclusion to his argument?

- A B C D
- (1)

(e) What evidence does the writer give in paragraphs two and three to support the view that environmentalists are rigid in their thinking? Indicate whether the evidence is fact or opinion or belief.

(2)

There will be additional marks for quality of written communication.

(3)

(Total 13 marks)

TOTAL FOR SECTION B: 13 MARKS

Q6



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SECTION C

**There are three questions in this section. You should answer ONE of them.
Put a cross in the box indicating the question you have chosen (☒).
If you change your mind, put a line through the box (☒) and then put a cross in the
other box (☒).**

**You are reminded that an appropriate conclusion to your argument is required.
In answering the question you should consider arguments for and against the statement.**

7. “The energy resources available to a country profoundly affect that country’s technological development.”

How far do you agree with this statement? (17)

8. “The production of food supplements, in the form of vitamin tablets, mineral preparations, and herbal remedies, is a multimillion-pound industry in Britain today. Such an industry poses a great risk to the health of the public.”

How far do you agree with this view? (17)

9. “The exploration of space is a waste of time and money.”

How far do you agree with this assertion? (17)

There will be additional marks for quality of written communication. (3)

(Total 20 marks)

Chosen Question Number: **Question 7** ☒ **Question 8** ☒ **Question 9** ☒



