



General Certificate of Education
Advanced Subsidiary Examination
June 2011

General Studies (Specification A)

GENA2

Unit 2 AS Science and Society

Wednesday 25 May 2011 1.30 pm - 3.00 pm

For this paper you must have:

- a Source Booklet for Section A (enclosed)
- an objective test answer sheet for Section A
- an 8-page answer book for Section B.

You may use a calculator.

Time allowed

- 1 hour 30 minutes

Instructions

- Use black ink or black ball-point pen.
- Write the information required on the front of your answer book for Section B. The **Examining Body** for this paper is AQA. The **Paper Reference** is GENA2.
- Answer Section A (Questions 1.1 to 1.30) using the answer sheet provided **and one** pair of questions from Section B in your separate answer book.
- Do all rough work in your answer book.
- Hand in **both** your answer sheet **and** your answer book separately at the end of the examination.

Information

- The maximum mark for this paper is 65.
- This paper consists of two sections.
Section A contains 30 objective test questions based on material in the Source Booklet. There is 1 mark for each question.
Section B contains three alternative pairs of questions. Marks are shown after each question and the total for each pair is 35.

Section A

There is 1 mark for each question.

Read the passage entitled **IVM – a cheap, painless alternative to IVF?**, printed in a separate booklet, and answer **Questions 1.1 to 1.30** by choosing the answer represented by the letter (**A**, **B**, **C** or **D**), that you think best. Mark your responses on your objective test answer sheet.

1.1 In IVF treatment

- A** sperm is added to an egg outside the woman's body.
- B** sperm is inserted into the womb using a syringe.
- C** eggs are grown in the laboratory.
- D** sperm are grown in the laboratory and inserted into the womb.

1.2 According to paragraph 1 what percentage of couples are said to be infertile in the UK?

- A** 0.2%
- B** 0.6%
- C** 6%
- D** 17%

1.3 IVF treatment is restricted on the NHS because

- A** only one in six couples are affected.
- B** budgets for health care are limited.
- C** health authorities are waiting for a cheaper alternative.
- D** many doctors refuse to participate on ethical grounds.

1.4 According to paragraph 3, of 100 women having fertility treatment, approximately how many might be expected to have the dangerous hyperstimulation side effect from the drug treatment?

- A** 3
- B** 17
- C** 25
- D** 33

1.5 For IVF treatment (paragraph 3 and **Figure 1**) fertility drugs are used to

- A** cause ovulations to occur earlier within the menstrual cycle.
- B** increase the number of follicles a woman produces in her lifetime.
- C** increase the number of follicles that mature at one time.
- D** reduce the risk of developing polycystic ovarian syndrome.

- 1.6** Polycystic ovarian syndrome (PCOS) means that
- A** there are no eggs in the ovary.
 - B** too many follicles are released.
 - C** often the eggs do not mature.
 - D** one mature egg is released each month.
- 1.7** The total number of multiple births following IVF in England and Wales in 2005 (**Figure 2**) was
- A** 2 170
 - B** 4 374
 - C** 9 058
 - D** 11 262
- 1.8** Of the babies born by IVF in 2005 (**Figure 2**), what percentage were twins?
- A** 21%
 - B** 32%
 - C** 38%
 - D** 67%
- 1.9** What was the approximate median birthweight in 2006 (**Figure 3**)?
- A** 2.5 kg
 - B** 3.0 kg
 - C** 3.3 kg
 - D** 3.5 kg
- 1.10** In IV techniques, eggs are fertilised in
- A** the fallopian tubes.
 - B** the uterus.
 - C** a syringe.
 - D** a culture medium.
- 1.11** If 20 eggs are harvested and grown for IVF, how many are likely to lead to a pregnancy (paragraph 7)?
- A** 3
 - B** 4
 - C** 5
 - D** 9

-
- 1.12** Assuming that the IVF live births in 2005 (**Figure 2**) were 45% of those undergoing treatment, approximately how many couples were involved in IVF treatment at that time?
- A** 4 080
 - B** 9 060
 - C** 16 470
 - D** 20 130
- 1.13** Which of the following is the best description of the word 'culture' (paragraph 9) as used in this passage?
- A** a refined technique
 - B** the result of cultivation
 - C** a specific growth medium
 - D** a particular group of cells
- 1.14** Cytoplasm (referred to in **Figure 5**) is found
- A** filling the cell.
 - B** surrounding the cell.
 - C** in the nucleus of a cell.
 - D** in the cell wall.
- 1.15** Which of the following statements are fact rather than opinion?
- 1** ICSI removes the need for the sperm to penetrate the outer layer of an egg.
 - 2** Those children who are conceived through ICSI will be just as healthy as those conceived naturally.
- Answer
- A** if both are facts.
 - B** if **1** alone is a fact.
 - C** if **2** alone is a fact.
 - D** if neither is a fact.
- 1.16** Increasing the number of IVM treatments
- A** will reduce the cost for each infertility treatment.
 - B** should lower the risk of a birth abnormality.
 - C** could reduce inequalities over access to fertility treatment.
 - D** may only be possible if taxes are increased.

1.17 Fertilisation takes place when

- A** many sperm enter the uterus.
- B** a sperm makes contact with an egg.
- C** a sperm first penetrates the membrane surrounding an egg.
- D** a nucleus from an egg and a sperm fuse.

1.18 The temperature of the culture used in the IVM process is likely to be approximately

- A** 0°C
- B** 37°C
- C** 60°C
- D** room temperature.

1.19 At the time of writing, benefits of IVM over IVF included

- 1** lower cost of each treatment.
- 2** a 25% success rate.
- 3** offering it to all women.
- 4** causing less discomfort.

Answer

- A** if **1** and **2** only are correct.
- B** if **1** and **4** only are correct.
- C** if **2** and **3** only are correct.
- D** if **3** and **4** only are correct.

1.20 In the UK, at the time the article was written

- A** many clinics were licensed for IVM.
- B** IVM had a high success rate.
- C** the success rate for IVM was unreliable.
- D** cost had limited the number of women undergoing IVM.

1.21 Which of the following processes is carried out in IVM treatment but not in IVF treatment?

- A** Eggs are removed from the ovary.
- B** Eggs are matured in the laboratory.
- C** Eggs are fertilised by ICSI.
- D** Fertilised eggs are replaced in the womb.

Turn over ►

1.22 IVM treatment is more advantageous than IVF treatment because

- 1 it is cheaper.
- 2 success rates are higher.
- 3 it is safer for the mother.
- 4 multiple births are unlikely.

Answer

- A if 1 and 2 only are correct.
- B if 1 and 3 only are correct.
- C if 2 and 3 only are correct.
- D if 3 and 4 only are correct.

1.23 Which of the following is the best explanation for not offering all women IVM treatment?

- A The process is too expensive.
- B Not all women are able to travel to Oxford.
- C Not all women produce sufficient eggs each month.
- D Some women feel happier using medically tested drugs.

1.24 Which of the following statements expresses an opinion about IVM, rather than a fact?

- A Future research will increase IVM's success rate.
- B Each IVM treatment is cheaper than each IVF treatment.
- C IVM is less taxing for a woman than IVF treatment.
- D A lower cost for IVM treatment than for IVF will allow more infertile couples to afford in vitro treatment.

1.25 From the information in the passage, each of the following explains why some women opt for IVF treatment rather than IVM treatment **except**

- A there is a lower success rate with IVM.
- B there is less discomfort with IVM.
- C IVM is less cost effective than IVF.
- D IVM is less widely available than IVF.

1.26 Which of the following statements is fact rather than opinion?

- A IVM will replace IVF as the main method of fertility treatment in the future.
- B The success rate of IVF is inadequate.
- C The success rate of IVM will improve with time.
- D Children from multiple births are more likely to have been premature.

Assertion / Reason questions

For Questions **1.27** to **1.30** you are given an assertion followed by a reason. Consider the assertion and decide whether, on its own, it is a true statement. If it is, consider the reason and decide if it is a true statement. If, and only if, you decide that both the assertion and the reason are true, consider whether the reason is a valid or true explanation of the assertion. Choose your answer (**A** to **D**) as follows and indicate your choice on the answer sheet.

	Assertion	Reason	Argument
A	True	True	Reason is a correct explanation of assertion
B	True	True	Reason is not a correct explanation of assertion
C	True	False	Not applicable
D	False	-	Not applicable

ASSERTION

REASON

- | | | | |
|-------------|--|---------|---|
| 1.27 | The babies born in October 2007 following IVM were identical twins | because | identical twins result when one fertilised egg splits and develops as two separate individuals. |
| 1.28 | Multiple births are more likely to result in the death of babies | because | the babies are likely to be premature and below average birthweight. |
| 1.29 | IVM is a safer procedure for a woman than IVF | because | there is no artificial stimulation of the ovaries. |
| 1.30 | IVM treatments cost less than IVF treatments | because | at the time of writing, there was a 25% success rate. |

END OF SECTION A

Turn over ►

Section B

Answer **one pair** of questions only, **EITHER 02 and 03**
OR 04 and 05
OR 06 and 07.

For each pair of questions, read the stimulus extract provided and answer the questions with reference to the extract and your own knowledge.

You will be marked on your ability to use good English, to organise information clearly and to use specialist vocabulary where appropriate.

EITHER**Questions 02 and 03****Extinction and conservation**

Conservation experts have signalled that the world is in the grip of the “sixth great extinction” of species, driven by the destruction of natural habitats, hunting, the spread of alien predators and disease, and climate change.

For most of the 3.5 billion year history of life on the planet, the background rate of loss of species is thought to have been about one in every million species each year. The International Union for the Conservation of Nature has calculated that the rate of loss has risen to between 100 and 1000 per million species annually – a situation comparable to the five previous “mass extinctions”, the last of which was when the dinosaurs were wiped out about 65 million years ago.

Despite the worsening problem, and the increasing threat of climate change, experts stress that understanding of the problems which drive plants and animals to extinction has improved greatly, and that targeted conservation can be successful in saving species from likely extinction in the wild.

Source: adapted from JULIETTE JOWIT, ‘Humans driving extinction faster than species can evolve, say experts’,
The Guardian, 7 March 2010
© Guardian News and Media Ltd

- | | | |
|---|---|---|
| 0 | 2 | Examine the reasons for the increased risk of extinction of plants and animals.
(17 marks) |
| 0 | 3 | Discuss the importance of conservation and the range of measures that could be implemented.
(18 marks) |

OR

Questions 04 and 05

Earthquakes

Since the timing and magnitude of an earthquake cannot accurately be predicted, it is easy to see them as arbitrary misfortunes. But Haiti's tragedy is partly manmade.

The tectonic movement that shook Haiti's capital city, Port-au-Prince, to rubble was a natural disaster. But the scale of the horror is an expression also of Haiti's particular vulnerabilities: poverty, weak infrastructure, political crisis, environmental degradation and international neglect.

It is not the ground that kills in an earthquake; it is the buildings. Port-au-Prince was densely populated and largely made from low-grade, poorly reinforced concrete. The country also lacked technology for clearing rubble and treating casualties. That is how poverty and lack of investment kill.

Haiti is the poorest country in the northern hemisphere and a blight on the conscience of the western world. Its position on a major fault line is bad luck; its social and economic fragility is not.

Source: adapted from Editorial, 'Haiti needs long-term commitment from us all', *The Observer*,
17 January 2010
© Guardian News and Media Ltd

0	4
---	---

 Explain the causes and effects of earthquakes. (17 marks)

0	5
---	---

 Consider how 'social and economic fragility' contributes to the harm caused by earthquakes and suggest how these problems might be overcome. (18 marks)

Turn over for the next question

Turn over ►

OR

Questions 06 and 07

Scientific objectivity

The point of science is that it can give us impartial answers to important questions. Doctors and patients can look at scientific evidence to help them decide what makes a healthy diet, or whether a drug can treat a particular condition. Scientific journals publish detailed reports of research, allowing readers to see for themselves that the studies were unbiased.

Of course, there are other factors at work too. Researchers are only human, journals want to publish exciting new findings, and drug companies want to demonstrate that their products are effective. That's why scientific journals work hard to be transparent about conflicts of interest, and usually give information about how studies were funded.

Industry funding isn't in itself a cause for alarm. A good study is a good study, regardless of who paid for it, but being open about conflicts of interest is part of the process by which we can trust scientific evidence.

Source: adapted from British Medical Journal Group, 'Can we trust industry-funded drug research?',
4 January 2010
© Guardian News and Media Ltd

- 0 6** Explain the principles involved in conducting objective scientific research. *(17 marks)*
- 0 7** Discuss how government policies and the interests of major industries (for example, the pharmaceutical, energy and defence industries) can influence and distort scientific research and development. *(18 marks)*

END OF QUESTIONS

There are no questions printed on this page

There are no questions printed on this page