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| Surname   | Initial(s) |
| Signature |            |

Paper Reference(s)

**5006                      5026**

# **Edexcel GCSE**

**Science (5006)**

**Biology (5026)**

B1b – Topics 3 and 4

**Foundation and Higher Tier**

Thursday 22 November 2007 – Morning

Time: 20 minutes

**Materials required for examination**

Multiple Choice Answer Sheet  
HB pencil, eraser and calculator

**Items included with question papers**

Nil

**Instructions to Candidates**

Use an HB pencil. Do not open this booklet until you are told to do so.  
Mark your answers on the separate answer sheet.

**Foundation tier candidates:** answer questions 1 – 24.

**Higher tier candidates:** answer questions 17 – 40.

All candidates are to answer questions 17 – 24.

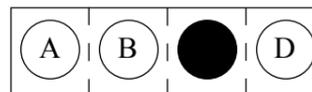
**Before the test begins:**

Check that the answer sheet is for the correct test and that it contains your candidate details.

**How to answer the test:**

For each question, choose the right answer, A, B, C or D  
and mark it in HB pencil on the answer sheet.

For example, the answer C would be marked as shown.



Mark only **one** answer for each question. If you change your mind about an answer, rub out the first mark **thoroughly**, then mark your new answer.

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*Turn over*

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**Questions 1 to 16 must be answered by Foundation tier candidates only.  
Higher tier candidates start at question 17.**

**Tuberculosis (TB)**

The picture shows an X ray from someone who has tuberculosis (TB).



**1.** The organ damaged by TB is the

- A** heart
- B** liver
- C** lung
- D** brain

**2.** TB is caused by a

- A** bacterium
- B** drug
- C** protoctist
- D** virus

**3.** TB is spread by

- A** breathing air
- B** drinking water
- C** sexual contact
- D** insect bites

4. Throughout the world, one person is infected with TB each second and someone dies of TB every ten seconds.  
Which row of the table shows the numbers of people who would be infected and dead after one minute?

|   | infected | dead |
|---|----------|------|
| A | 10       | 1    |
| B | 60       | 6    |
| C | 100      | 10   |
| D | 600      | 60   |

#### Drinking 'dirty' water

Mary fell into a river and swallowed some of the water. She became very ill.

5. Her illness would most likely be caused by
- A drugs
  - B pathogens
  - C hormones
  - D antibodies
6. Mary's doctor told her she had an
- A infection
  - B overdose
  - C addiction
  - D allergy
7. He said she would soon get better because her body would make
- A a vaccine
  - B antibodies
  - C lysozyme
  - D impulses
8. He said she would not suffer the same illness again because she was
- A immune
  - B vaccinated
  - C overdosed
  - D allergic

### Blood transfusion

The blood transfusion service wants more people to give blood as stocks are very low.

When people give blood it has to be checked. This is known as screening.

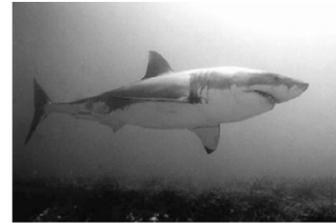


Source: ©www.CartoonStock.com

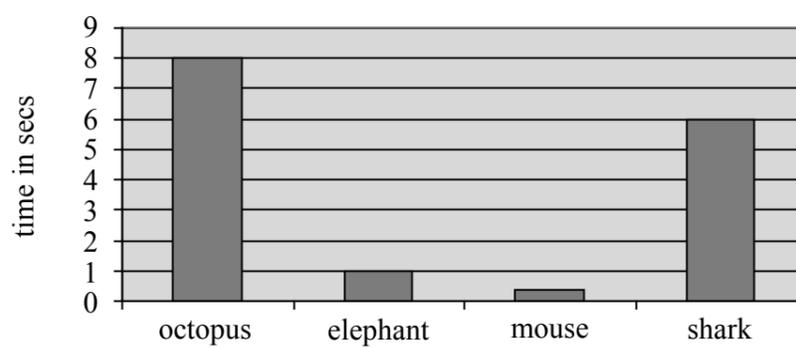
9. Why is this blood screened?
- A to prevent diseases being passed on to patients
  - B in case it is not the correct blood type
  - C so the blood donor is given the correct blood
  - D to protect the nurse taking the blood sample
10. The function of red blood cells is to
- A carry plasma
  - B transport hormones
  - C carry oxygen
  - D ingest bacteria
11. What part of the blood is involved in clotting?
- A urea
  - B platelets
  - C haemoglobin
  - D white blood cells
12. Hormones are transported in the blood.  
What are hormones?
- A electrical impulses
  - B chemical messengers
  - C enzymes
  - D mineral ions

### The great white shark

The great white shark has some highly developed senses. It can pick up tiny changes in its environment such as a temperature drop of less than 1 °C. Its eyes are well adapted to see in the ocean.



13. The graph shows the reaction time of four animals in response to a change in light intensity.



Which animal has the slowest reaction time in response to light?

- A octopus
  - B elephant
  - C mouse
  - D shark
14. Which sense organ in humans can detect changes in temperature?
- A eye
  - B liver
  - C skin
  - D heart
15. The eye responds to the amount of light that enters it. What is the name of this response?
- A the pupil reflex
  - B the iris reflex
  - C the retina reflex
  - D the lens reflex
16. Why is it important that the human eye reacts to changes in light intensity?
- A to protect the lens from too much light
  - B to protect the retina from too much light
  - C to help to focus an image
  - D to make the iris change shape

**Higher tier candidates start at question 17 and answer questions 17 to 40.**  
**Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.**

**Pain relief**

Multiple sclerosis (MS) sufferers can be prescribed cannabis to relieve pain.  
About 20% of people with MS in Europe use cannabis for pain relief.

17. This suggests that for every 1000 people with MS, the number that use cannabis is

- A 20
- B 200
- C 1000
- D 20 000

18. Some people are concerned about this method of treatment because cannabis causes

- A pain relief
- B addiction
- C psychosis
- D sleep

19. Scientists decided to carry out an experiment to find out if cannabis does reduce pain.

They divided 100 MS sufferers into two groups. They gave each group either cannabis, nothing or a dummy tablet (placebo).

Which experiment is likely to produce the most valid results?

| experiment | group 1 of 50 sufferers given | group 2 of 50 sufferers given |
|------------|-------------------------------|-------------------------------|
| A          | cannabis                      | cannabis                      |
| B          | nothing                       | placebo                       |
| C          | cannabis                      | placebo                       |
| D          | nothing                       | cannabis                      |

20. Another drug that could be used to relieve pain is

- A a barbiturate
- B opium
- C tobacco
- D caffeine

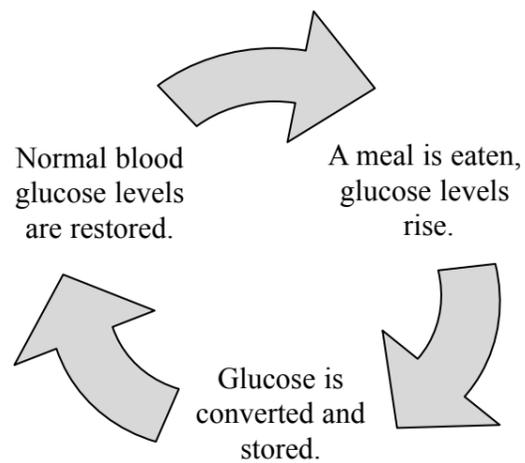
### Diabetes increase in school children

A recent government survey showed that the numbers of school children suffering from diabetes has increased by 10%. Doctors believe this is because children consume too much sugar.

21. People with diabetes do not make enough of the hormone

- A adrenalin
- B glucagon
- C glycogen
- D insulin

22. This diagram shows the way that glucose levels are regulated in the blood



Glucose can be converted into another substance and stored in the body. What is the glucose converted into and where is it stored?

- A glucagon stored in the pancreas
- B glycogen stored in the pancreas
- C glucagon stored in the liver
- D glycogen stored in the liver

23. People with diabetes cannot lower their blood sugar levels naturally.  
What is **least** likely to affect the glucose levels of a diabetic?
- A a diet including high proportions of sweets and cakes
  - B a high protein diet
  - C daily injections of insulin
  - D daily injections of glucagon
24. Insulin can now be made using genetically modified bacteria.  
What is an ethical concern about using genetically modified bacteria to produce hormones for human use?
- A The hormone produced may have a different effect from the original
  - B Bacterial diseases may be passed on to humans
  - C Humans should not modify other living things
  - D Mammals can be harmed in the process of harvesting the hormone

**TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS**

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**Foundation tier candidates do not answer any more questions after question 24.**

**Questions 25 to 40 must be answered by Higher tier candidates only.  
Foundation tier candidates do not answer questions 25 to 40.**

**Binge drinking**

Binge drinking means drinking large amounts of alcohol in a short period of time.

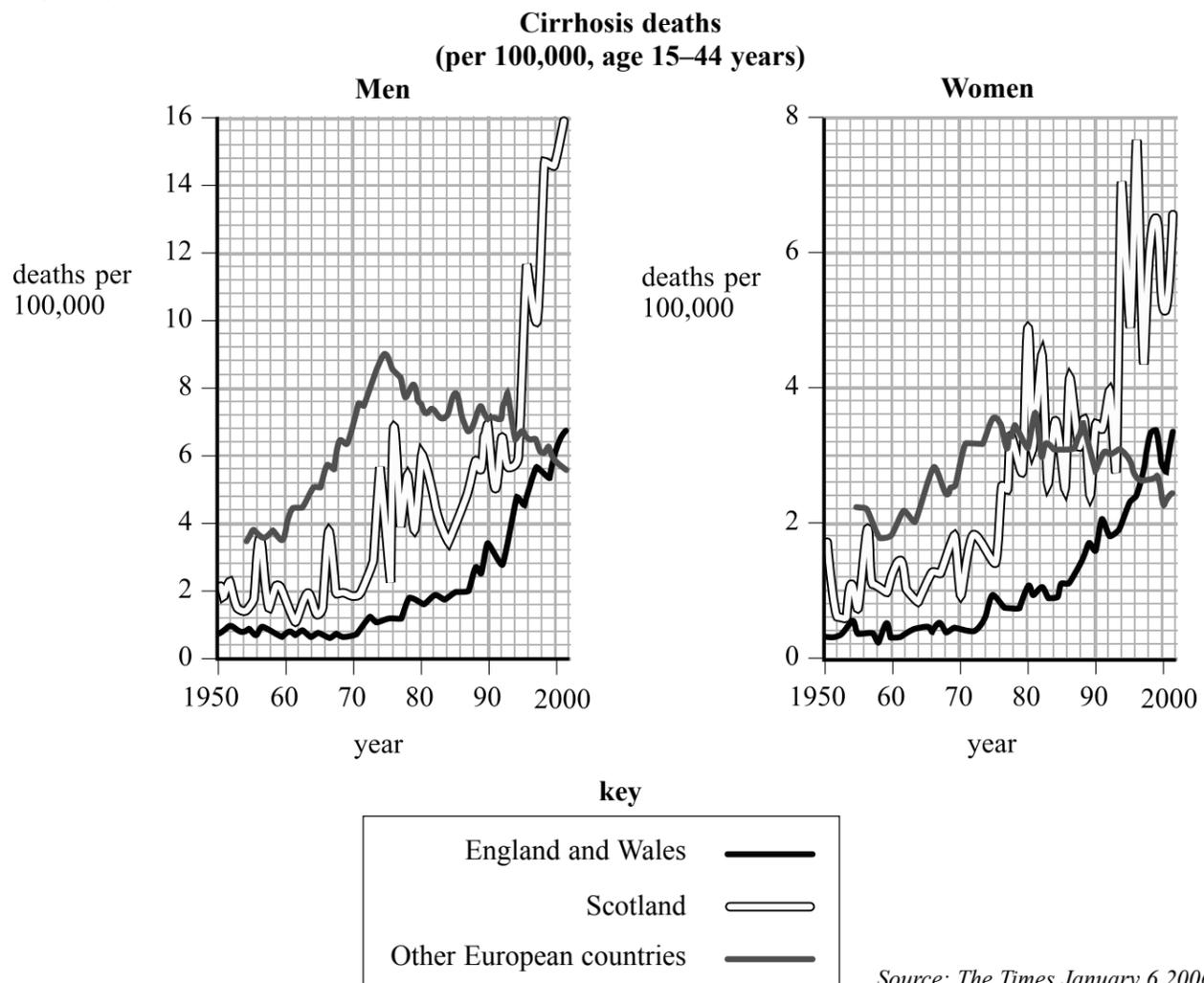
**25.** This behaviour is unhealthy because alcohol

- A** damages the lungs
- B** increases infection
- C** reduces pain
- D** damages the liver

Drinking large amounts of alcohol increases the risk of death from a disease called cirrhosis.

Use the graphs to answer questions 26 and 27.

The graphs show the number of deaths per 100,000 men or women in different countries from the years 1950 to 2000.



26. The data in the graphs suggests that the people most at risk of death from cirrhosis in the year 2000 were

- A men from Scotland
- B women from Scotland
- C men from other European countries
- D women from other European countries

27. 20 men died from cirrhosis in 1960 in a town containing 500,000 men. This town was most likely in

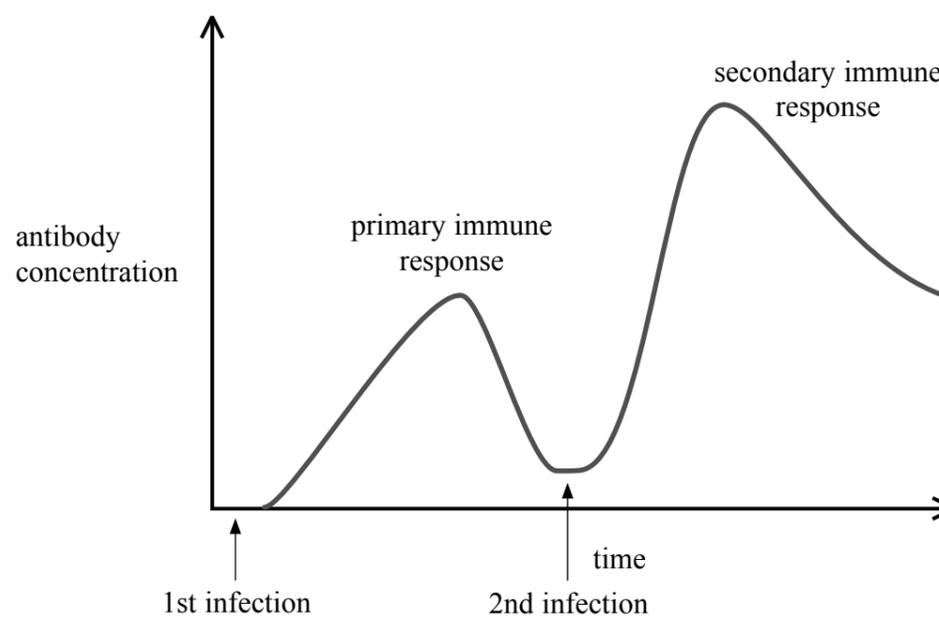
- A England
- B Wales
- C Scotland
- D other European countries

28. Which row of the table shows some other risks of drinking too much alcohol?

|          | reduces reaction time | causes liver damage |
|----------|-----------------------|---------------------|
| <b>A</b> | yes                   | yes                 |
| <b>B</b> | yes                   | no                  |
| <b>C</b> | no                    | yes                 |
| <b>D</b> | no                    | no                  |

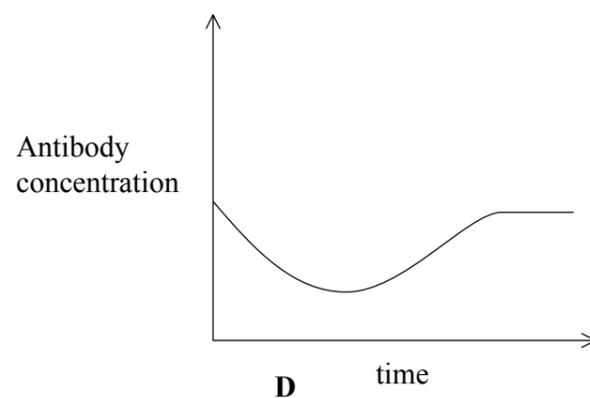
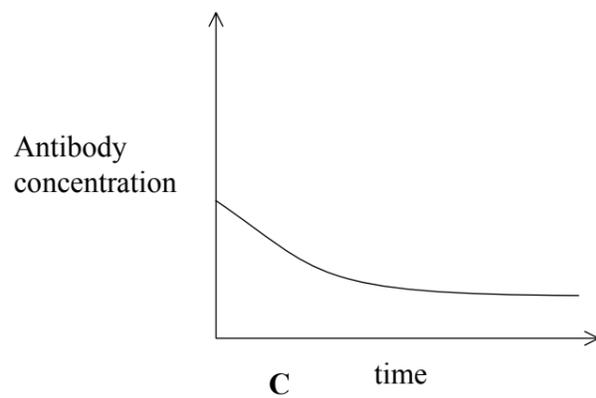
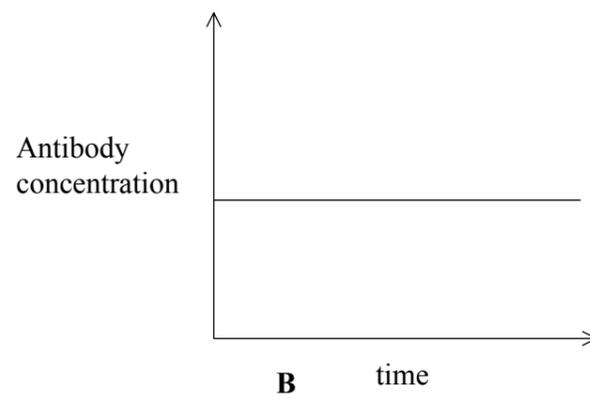
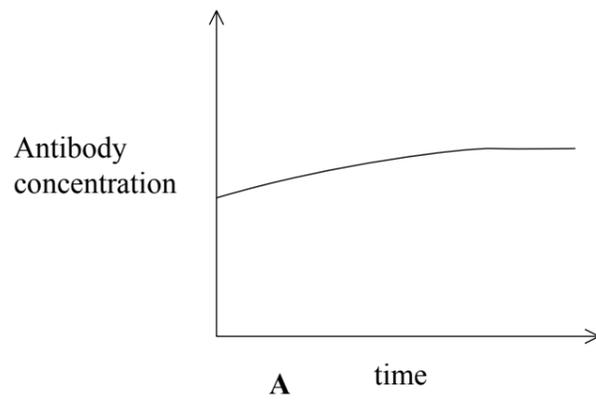
### Cholera

The organism causing the disease cholera infected a person on two different occasions. The graph shows the level of antibodies in the blood of the person after each infection.



29. After the second infection antibodies were produced
- A** sooner and at a faster rate than the first infection
  - B** later and at a faster rate than the first infection
  - C** sooner and at a slower rate than the first infection
  - D** later and at a slower rate than the first infection

30. The infected person recovered fully from cholera and was not reinfected. Which graph shows the antibody concentration in the blood for the two months following the secondary infection?



31. Which row of the table describes pathogens?

|          | contain antibodies | have antigens |
|----------|--------------------|---------------|
| <b>A</b> | yes                | yes           |
| <b>B</b> | yes                | no            |
| <b>C</b> | no                 | yes           |
| <b>D</b> | no                 | no            |

32. These statements are about an infection called tuberculosis (TB).
- 1 TB is increasing in the UK because there are drug resistant forms of the bacteria.
  - 2 TB is increasing in the UK because there is more global travel.
  - 3 TB is increasing in the UK because there are no effective antibiotics.

Which are true?

- A 1 only
- B 1 and 2 only
- C 1, 2 and 3
- D neither 1, 2 nor 3

#### Parkinson's disease

Parkinson's disease is most commonly viewed as a movement disorder. Scientists have also found out that the disease causes problems in the senses of touch and vision of affected people.

*(Science Daily)*

33. Which of the body systems is directly affected by Parkinson's disease?
- A circulatory system
  - B endocrine system
  - C nervous system
  - D reproductive system
34. Which of the following conditions have a similar effect to Parkinson's disease?
- 1 grand mal epilepsy
  - 2 strokes
  - 3 brain tumors
  - 4 heart attacks
- A 1 only
  - B 1 and 2 only
  - C 1, 2 and 3 only
  - D all four

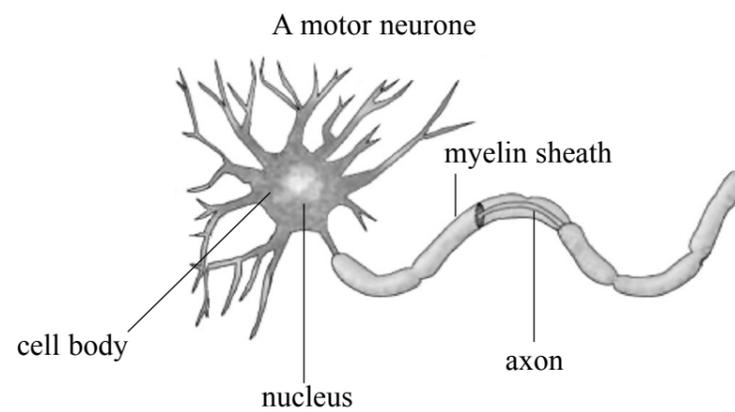
35. These are three statements about involuntary reactions

- 1 The 'ducking' reflex occurs due to a change in light intensity.
- 2 Accommodation enables people to focus on near and far objects.
- 3 The reflex arc is used in response to a stimulus.

Which are true?

- A 1 and 2 only
- B 2 and 3 only
- C 1 and 3 only
- D 1, 2 and 3

36.



What is the function of the myelin sheath?

- A It protects the axon from bacterial infection
- B It insulates the chemical signal passing along the neurone
- C It reduces the loss of signal from chemical transmitters
- D It insulates the electrical signal passing along the neurone

### New birth control pill

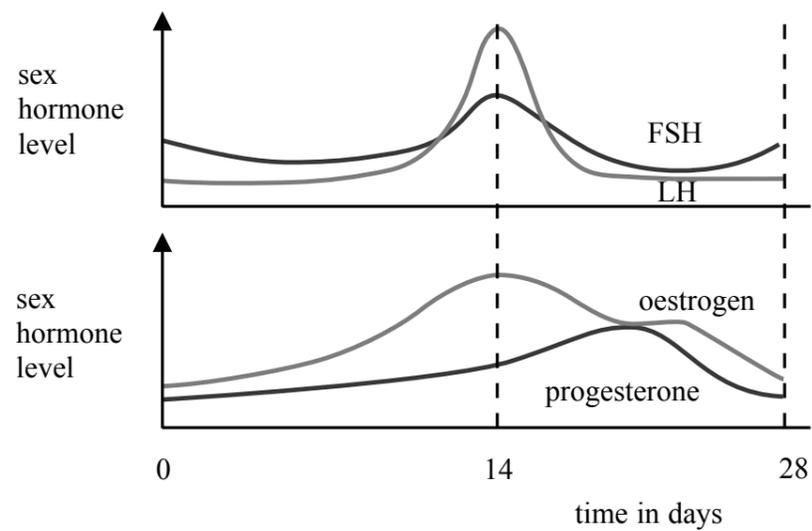
A new contraceptive pill that frees women from menstruation and its associated stomach pains and mood swings will be introduced in Britain early next year.

The new pill, Lybrel, is the first designed to be taken all year round without a break.

37. For this contraceptive to prevent menstruation, what must the levels of oestrogen or progesterone be kept at in the blood?
- A oestrogen level kept high
  - B oestrogen level kept low
  - C progesterone level kept high
  - D progesterone level kept low
38. LH and FSH are sex hormones produced by the pituitary gland. What is a use of these hormones in medicine?
- A treating infertility in men
  - B treating infertility in women
  - C treating infertility in both men and women
  - D to aid implantation in IVF treatment

Use the graph to answer questions 39 and 40.

The graph shows hormone levels during the menstrual cycle.



39. High levels of FSH and LH cause

- A menstruation
- B ovulation
- C implantation
- D fertilisation

40. Menstruation will occur when

- A LH and FSH only are low
- B oestrogen and progesterone only are high
- C all four hormone levels are high
- D all four hormone levels are low

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**TOTAL FOR HIGHER TIER PAPER: 24 MARKS**

**END**