

Surname	Initial(s)
Signature	

Paper Reference(s)

5006 5026

Edexcel GCSE

Science (5006)

Biology (5026)

B1b – Topics 3 and 4

Foundation and Higher Tier

Friday 6 March 2009 – 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.

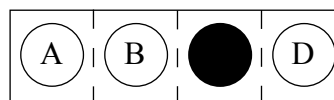
Before the test begins:

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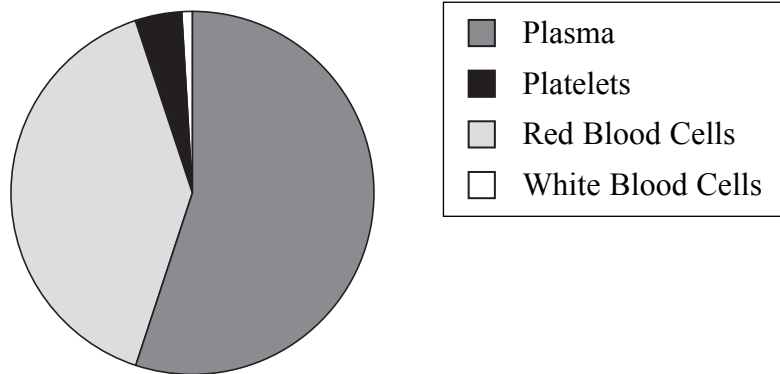
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**Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.**

Simon's blood test

Simon has been feeling ill. He is tired all the time. Simon went to his doctor for a blood test. The results are shown in the pie chart.

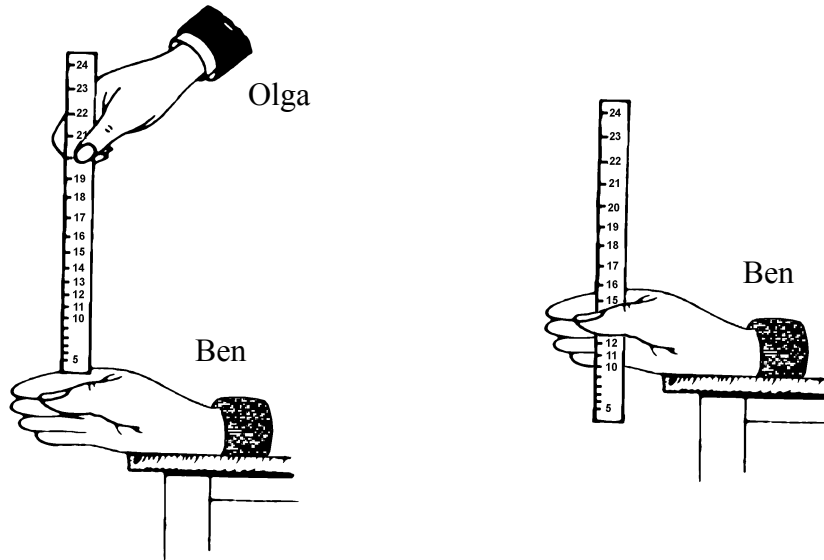


- Simon's blood contains mainly
 - plasma
 - platelets
 - red blood cells
 - white blood cells
- The doctor said Simon's red blood cell count was low. What is the role of red blood cells in the body?
 - to defend against disease
 - to carry oxygen
 - to carry dissolved glucose
 - to aid blood clotting
- The doctor also checked the glucose levels in Simon's blood. Hormones control glucose levels. How are hormones carried around the body?
 - bonded to red blood cells
 - bonded to white blood cells
 - dissolved in the plasma
 - dissolved in the platelets
- Which hormone controls glucose levels in the blood?
 - insulin
 - oestrogen
 - progesterone
 - testosterone

Measuring reaction times

Olga and Ben are doing an experiment to measure their reactions. Olga drops a ruler from just above Ben's hand and he tries to catch it as quickly as possible. She repeats this experiment twice. Ben then does the same for Olga.

The results are shown in the table.



distance ruler fell before being caught	
Olga	Ben
15 cm	20 cm
16 cm	18 cm
11 cm	25 cm

5. What was Olga's average reaction distance?
- A 14 cm
 - B 15 cm
 - C 21 cm
 - D 42 cm
6. What was used in this experiment to measure their reactions?
- A stopwatch
 - B pulse meter
 - C ruler
 - D thermometer

7. Why did they do the experiment three times?
- A to make the results more reliable
 - B to make the results less accurate
 - C to get the correct result
 - D to make the results the same
8. What would be most likely to make Ben's reactions slower?
- A using nicotine patches
 - B taking caffeine
 - C drinking alcohol
 - D taking paracetamol

Smoking ban hits pub profits

A poll of pub landlords showed there had been a significant loss in trade since the start of the smoking ban in July 2007.
July and August profits were down by 20% on the previous year's trade.

9. What is likely to be a cause for the reduction in trade in pubs during July and August 2007?
- A people are becoming more health conscious and giving up smoking
 - B some people are drinking more in pubs
 - C people can no longer drink and smoke inside pubs
 - D pubs are no longer popular with non smokers
10. Why has the government banned people from smoking in public?
- A to stop people drinking as much alcohol
 - B to protect people from the effects of tobacco smoke
 - C to increase the number of people smoking at home
 - D to increase the taxes from tobacco
11. Smoking cigarettes causes lung cancer because
- A the nicotine is addictive
 - B the tar is addictive
 - C the nicotine is a carcinogen
 - D the tar is a carcinogen

12. Carbon monoxide is produced when smoking cigarettes.
This can cause problems because carbon monoxide
- A stops the red blood cells from carrying as much oxygen
 - B makes the heart beat slower
 - C is a major contributor to global warming
 - D is very addictive

Julia's fright

13. Julia was driving down the motorway when, out of the corner of her eye, she saw a plane rising into the air. This caused her to duck and she almost crashed her car.
This response is known as the ducking reflex.
What type of response is this?
- A involuntary response
 - B voluntary response
 - C accommodation
 - D the iris reflex
14. Accommodation ensures that you can
- A focus on near and distant objects
 - B move yourself out of danger
 - C react to light to protect the retina
 - D react to light to protect the lens
15. Which parts of the eye enable accommodation to take place?
- A lens and pupil
 - B lens and ciliary muscle
 - C iris and ciliary muscle
 - D iris and pupil
16. As you get older your eyes are less able to change focus. Many older people have to wear glasses.
Glasses for people who cannot focus on distant objects
- A magnify images to enable people to see close objects
 - B magnify images to enable people to see distant objects
 - C allow the lens of the eye to focus on distant objects
 - D alter the shape of the lens of the eye to allow focussing

**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.**

Caffeine

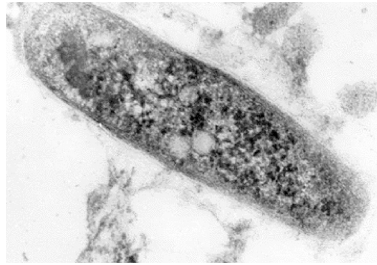
Caffeine is a drug that speeds up the transmission of nerve impulses.

17. What is the name given to this type of drug?
- A depressant
 - B hallucinogen
 - C analgesic
 - D stimulant
18. What is the most common method of taking caffeine?
- A injection
 - B drinking
 - C smoking
 - D inhaling
19. People sometimes take caffeine supplements.
What is the most likely reason to take a caffeine supplement?
- A to increase alertness
 - B to increase reaction time
 - C to aid sleep
 - D to reduce pain
20. Caffeine causes faster communication between two neurones.
Which row of the table correctly describes the gap between the neurones and the method of communication?

	gap between neurones	method of communication
A	synapse	electrical
B	synapse	chemical
C	relay	electrical
D	relay	chemical

Tuberculosis (TB)

The picture shows an organism that causes tuberculosis.



21. What type of organism causes tuberculosis?
- A bacteria
 - B fungi
 - C protoctista
 - D virus
22. Organisms that cause diseases like tuberculosis or malaria are
- A antibodies
 - B antigens
 - C vectors
 - D pathogens
23. How does the body try to get rid of a tuberculosis infection?
- A white blood cells ingest the organism
 - B red blood cells ingest the organism
 - C antigens break down the organism
 - D antibodies break down the organism
24. Tuberculosis is most likely to be spread
- A in water
 - B through droplets in the air
 - C by insects
 - D by hand to hand contact

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

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.**

Mosquitoes

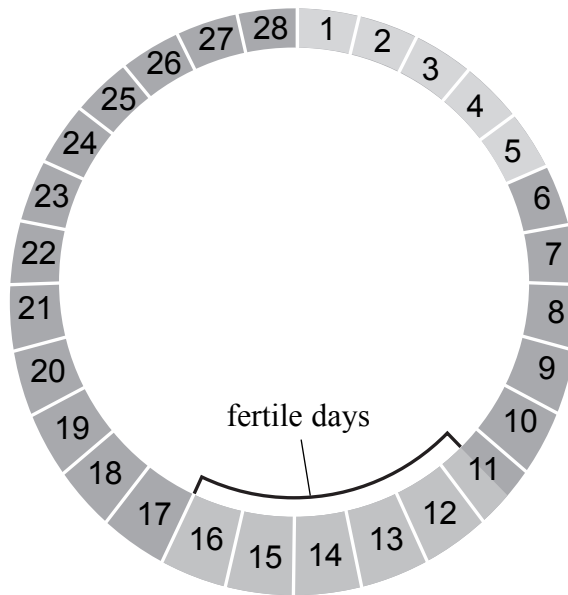
Mosquitoes are carriers of the protozoan *Plasmodium*.

Plasmodium can pass into the bloodstream of a person and cause malaria.

25. What is this type of disease transmission?
- A direct contact
 - B indirect contact
 - C vertical infection
 - D vector borne
26. What is the body's main physical barrier against malaria?
- A the cilia
 - B the skin
 - C white blood cells
 - D vaccination
27. When mosquitoes suck human blood it can cause an inflammatory response. The inflammatory response is part of the second line of defence against infection. Another second line of defence involves
- A white blood cells ingesting bacteria
 - B red blood cells ingesting a virus
 - C white blood cells producing antibodies
 - D platelet formation under the skin
28. Dogs are vectors of rabies, a disease caused by a virus. The virus is transmitted to humans in a similar way to *Plasmodium*. Rabies is passed to humans by
- A dogs licking food for human consumption
 - B dog faeces being touched by humans
 - C dogs biting through human skin
 - D dog fleas biting through human skin

The menstrual cycle

The diagram shows Janet's usual menstrual cycle.
She is a 53 year old woman who is not pregnant.

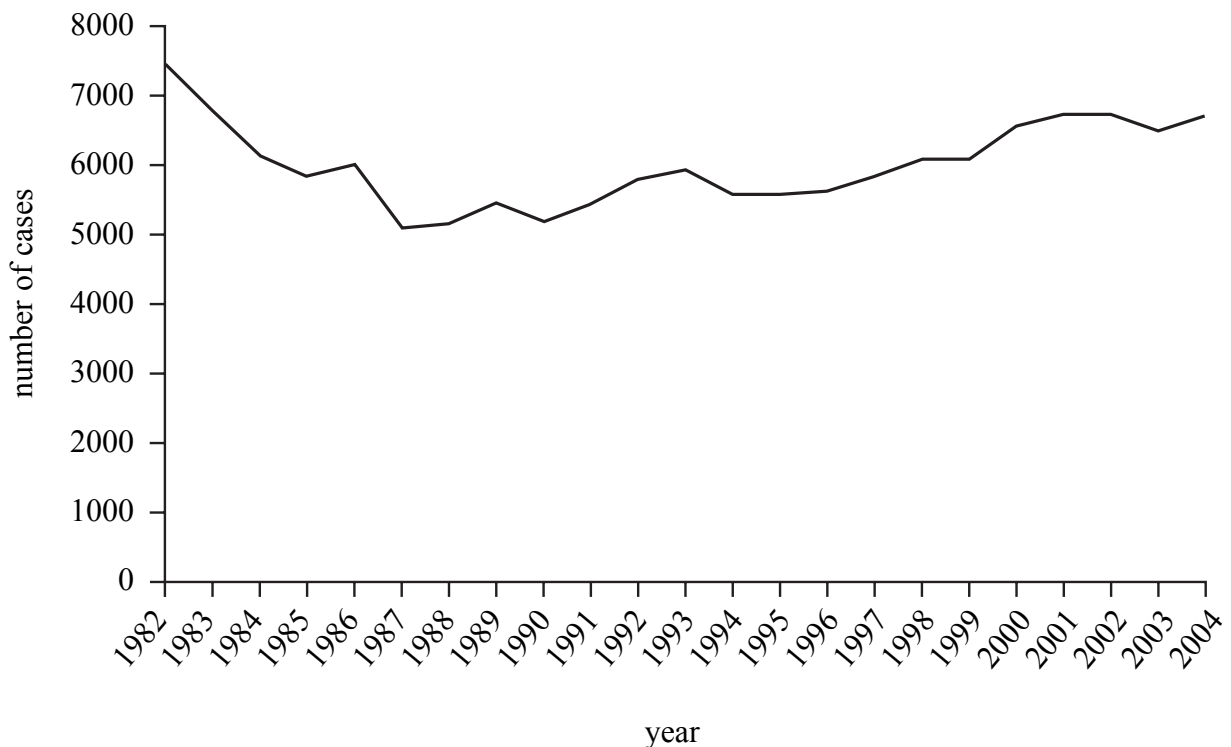


29. What happens between day 1 and day 5 of the menstrual cycle?
- A fertilisation
 - B implantation
 - C menstruation
 - D ovulation
30. In which part of the cycle is Janet most likely to ovulate?
- A days 1 – 5
 - B days 11 – 16
 - C days 17 – 21
 - D days 22 – 28
31. What is the most likely cause of high levels of oestrogen and progesterone throughout the whole of the menstrual cycle?
- A Janet is constantly menstruating
 - B Janet is infertile and cannot ovulate
 - C Janet is pregnant with twins
 - D Janet is taking the combined contraceptive pill

32. What would be an ethical concern of giving IVF treatment to Janet in particular?
- A IVF is more likely to result in multiple births
 - B IVF involves the use of genetically modified embryos
 - C Janet is more likely to have health problems
 - D Janet can choose the sex of her baby with IVF

Tuberculosis (TB) trends

The following graph shows the number of cases of TB in Britain between 1982 and 2004.



33. Using information from the graph, which of the following statements is correct?
The number of cases of TB
- A has fallen steadily since 1982
 - B has remained steady
 - C was at its lowest in 1987
 - D has fallen below 5000 only once
34. What is the most likely reason for the increase in TB cases since 1995?
- A decreased population in Britain
 - B decreased numbers of immigrants into Britain
 - C increased numbers of people relocating to rural areas
 - D increased numbers of people in urban areas

35. TB can now be cured using drug therapy and DOTS.
Why would this treatment be a problem for the health service?
- A the treatment is expensive in terms of drugs only
 - B the treatment is expensive in terms of drugs and staff
 - C the treatment needs funding for new drug development
 - D the treatment cannot be carried out in hospitals

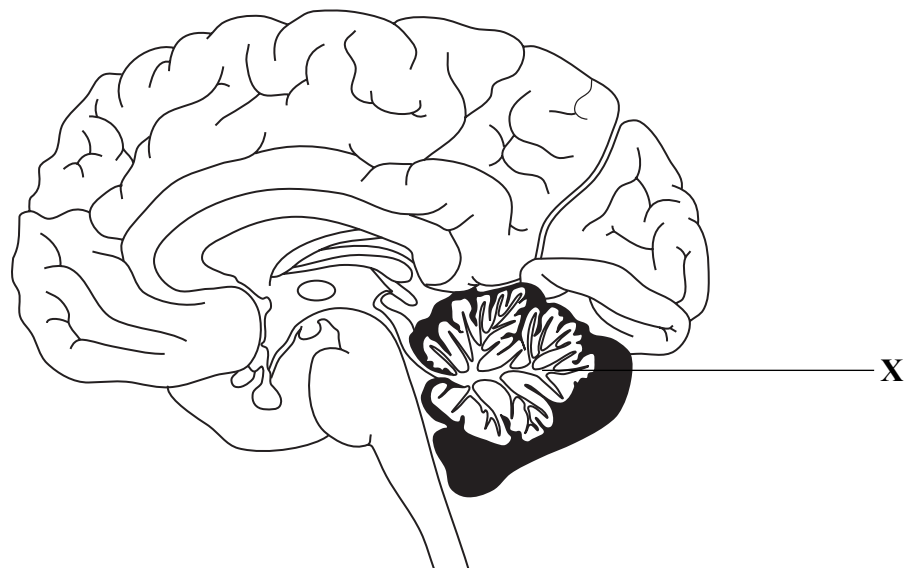
36. These are 2 statements about the treatment of tuberculosis
- 1 DOTS treatment relies on the use of one expensive antibiotic
 - 2 Some strains of tuberculosis are resistant to antibiotics

Which statements are **not** true?

- A 1 only
- B 2 only
- C both 1 and 2
- D neither 1 or 2

The amazing human brain

The human brain is an incredible organ. It controls many of the responses in the human body and yet we only use a very small proportion of it.



37. The section labelled X is the part which controls balance and muscles.
What is the name of this section of the brain?
- A cerebellum
 - B cerebral hemispheres
 - C medulla
 - D pituitary gland

38. Which section of the brain controls automatic responses such as breathing?

- A cerebellum
- B cerebral hemispheres
- C medulla
- D pituitary gland

39. Some responses are known as reflexes.

What is the correct pathway for a reflex from stimulus to response?

- A receptor → sensory neurone → relay neurone → motor neurone → effector
- B receptor → relay neurone → sensory neurone → motor neurone → effector
- C effector → sensory neurone → relay neurone → motor neurone → receptor
- D effector → motor neurone → relay neurone → sensory neurone → receptor

40. These are two statements about diseases that affect the brain

- 1 Grand mal epilepsy affects the electrical signals in the brain
- 2 Parkinson's disease causes the body to shake uncontrollably

Which statements are true?

- A 1 only
- B 2 only
- C both 1 and 2
- D neither 1 or 2

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

END