

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 4 March 2011 – 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.

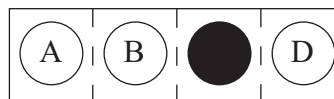
Before the test begins:

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.

Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.

You must not take this booklet or the answer sheet out of the examination room.

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

Danger

Freddie stands on a sharp object and he reacts to the pain.



1. Which one of Freddie's senses was stimulated when he stepped on the sharp object?

- A smell
- B sight
- C touch
- D taste

2. Freddie pulled his foot away from the sharp object before his brain was aware of pain. What type of reaction is this?

- A voluntary response involving the spinal cord
- B involuntary response involving the spinal cord
- C voluntary response involving the brain
- D involuntary response involving the brain

3. Which row of the table is correct for the stimulus and response in this reaction?

	stimulus	response
A	contact with sharp object	feeling pain in spinal cord
B	contact with sharp object	moving foot away
C	moving foot away	feeling pain in spinal cord
D	feeling pain in spinal cord	contact with sharp object

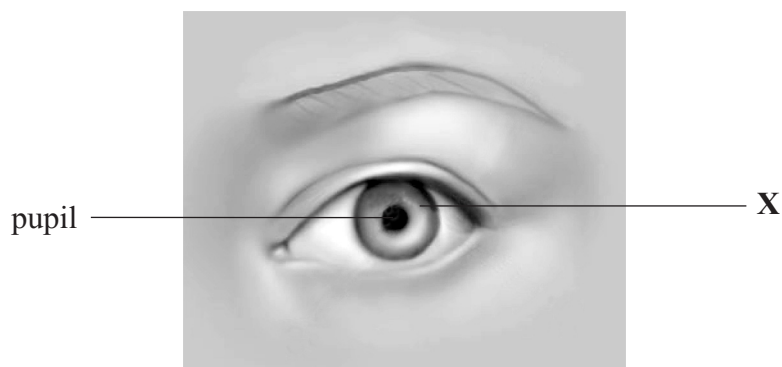
4. The central nervous system is
- A the brain only
 - B the spinal cord only
 - C the brain and spinal cord
 - D neither the brain nor spinal cord

Disease

5. The body can be affected by pathogens such as bacteria, fungi and viruses.
A pathogen is
- A a disease-curing organism
 - B a hormone
 - C an enzyme
 - D a disease-causing organism
6. Diseases can be caught by touching an infected person.
This type of disease transmission is
- A direct contact
 - B indirect contact
 - C vector transmission
 - D vehicle transmission
7. Our bodies have barriers to prevent microbes entering.
Which is the main barrier that prevents microbes entering the bloodstream?
- A hair
 - B mucus
 - C the skin
 - D the liver
8. Tears contains lysozymes.
What is the function of lysozymes?
- A to clump bacteria together
 - B to kill microorganisms
 - C to cause inflammation
 - D to make microorganisms multiply

The human eye

Use this diagram to answer questions 9, 10 and 11.



9. What is the name of the part of the eye labelled X?
- A iris
 - B cornea
 - C lens
 - D retina
10. What is the main function of the part of the eye labelled X?
- A to change focus for near and far objects
 - B to release chemicals to protect the eye
 - C to change the shape of the retina
 - D to change the amount of light entering the eye
11. A side effect of taking some drugs is that the pupil becomes very large. The pupil
- A allows light to reach the back of the eye
 - B is the protective covering of the eye
 - C is the main focusing part of the eye
 - D contains light receptors
12. Which row of the table shows the voluntary responses which happen in the eye?

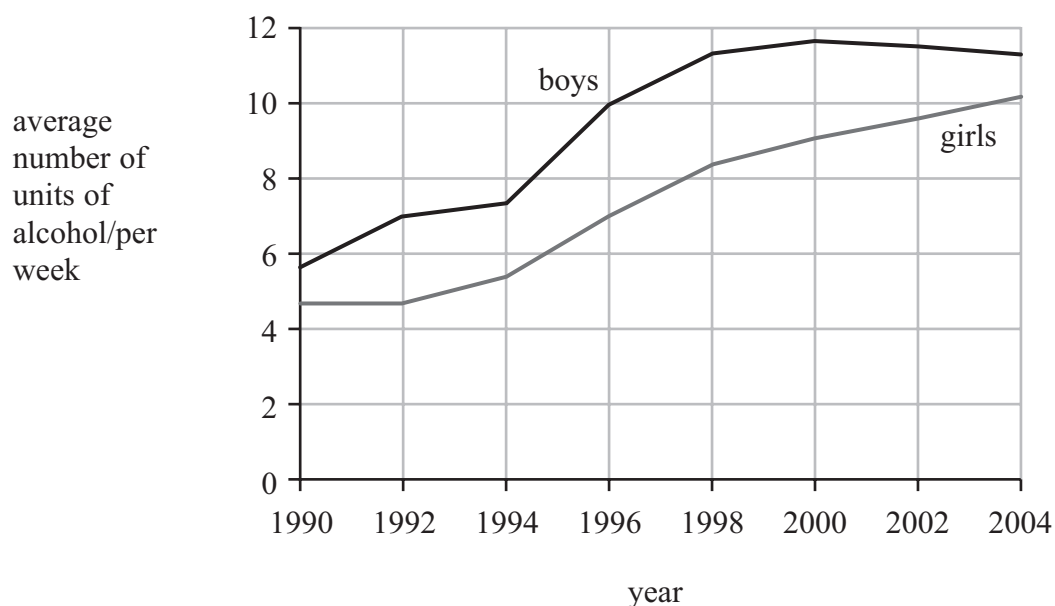
	accommodation	iris reflex
A	no	no
B	no	yes
C	yes	no
D	yes	yes

Under age drinking

Use this information to answer questions 13 and 14.

Children aged 11 to 15 who admitted to drinking alcohol were asked how much they drank in a week. This survey was repeated every year between 1990 and 2004.

The graph shows the average number of units of alcohol the children drank in each week between 1990 and 2004.



13. What is a correct statement based on the information in the graph?
- A girls drank an average of 10 units of alcohol in each week in 1996
 - B boys drank more units of alcohol on average each week than girls in 2004
 - C boys drank fewer units of alcohol on average each week in 1994 than in 1992
 - D girls drank fewer units of alcohol on average each week in 1992 than in 1990
14. Assuming that the boys drank the same number of units of alcohol each week during 1996, how many units of alcohol would they drink during a year?
- A 84 units
 - B 120 units
 - C 364 units
 - D 520 units

15. Drinking at a young age is dangerous because of the effects of alcohol on the brain. What other body organ is most damaged by drinking alcohol?

- A** liver
- B** lungs
- C** eyes
- D** blood

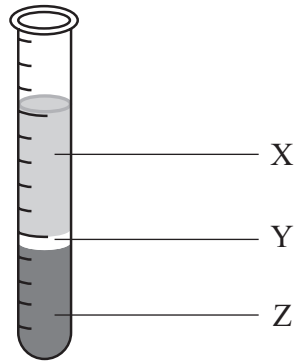
16. What type of drug is alcohol?

- A** stimulant
- B** opiate
- C** depressant
- D** painkiller

**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.**

The blood

17. The body contains between 4 and 5 litres of blood.
 If blood is left to stand it separates into three layers.



Layer X is the liquid part of the blood.
 Which row of the table identifies each of the blood components X, Y and Z?

	red blood cells	white blood cells	plasma
A	X	Y	Z
B	Y	Z	X
C	Z	X	Y
D	Z	Y	X

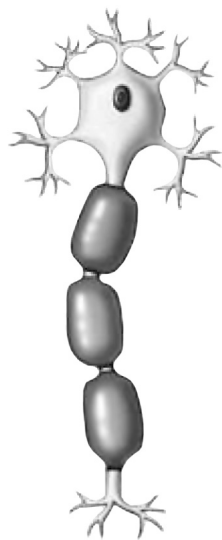
18. What is the main role of red blood cells?
- A to ingest bacteria
 - B to carry hormones
 - C to carry oxygen
 - D to form scabs
19. Structures in the gaseous exchange tract move bacteria.
 These structures are called
- A cilia
 - B antigens
 - C nasal hairs
 - D enzymes

20. Viruses such as HIV are most likely to be spread between drug users by
- A drinking alcohol
 - B inhaling solvents
 - C injecting opiates
 - D smoking cannabis

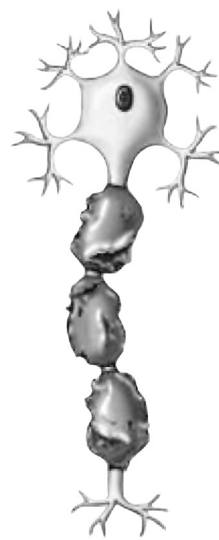
Multiple sclerosis

Use this information to answer questions 21 and 22.

Multiple sclerosis is a degenerative disease which causes the myelin sheath around neurones to become damaged.



neurone with myelin sheath



neurone with damaged myelin sheath

21. What is the role of the myelin sheath surrounding the neurone?
- A to carry impulses from one neurone to another
 - B to insulate the neurone which speeds up the nervous impulse
 - C to carry chemical messages along the neurone
 - D to link one neurone to another
22. A message is carried from a receptor organ to an effector muscle. Which shows some of the stages in the nerve pathway from receptor to effector?
- A sensory neurone → spinal cord → motor neurone → brain
 - B motor neurone → spinal cord → brain → sensory neurone
 - C sensory neurone → spinal cord → brain → motor neurone
 - D motor neurone → brain → spinal cord → sensory neurone

23. The gap between two neurones is called the
- A central nervous system
 - B peripheral nervous system
 - C synapse
 - D reflex arc
24. Information is passed from one neurone to another neurone by
- A electrical impulses
 - B chemical transmitters
 - C hormones in the bloodstream
 - D enzymes in the bloodstream

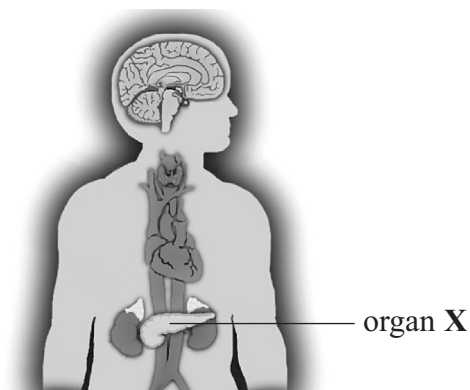
TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

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.

The endocrine system

25.



Organ X is essential in the control of blood glucose concentrations.
What is organ X?

- A stomach
- B heart
- C liver
- D kidney

26. Endocrine glands release chemicals into the body which act as chemical messengers.
Which row of the table shows the type of chemical released from endocrine glands and how they are transported around the body?

	type of chemical	method of transport
A	hormones	through the bloodstream
B	hormones	as impulses along neurons
C	enzymes	as impulses along neurons
D	enzymes	through the bloodstream

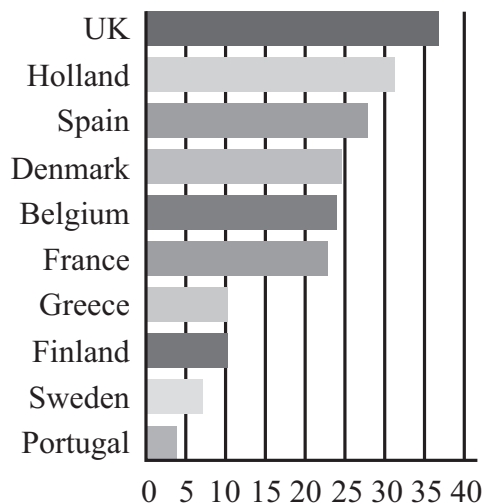
27. Insulin controls blood glucose concentrations.
Insulin triggers the conversion of

- A glucagon to glycogen which is stored in the pancreas
- B glucose to glycogen which is stored in the liver
- C glycogen to glucose which is stored in the liver
- D glucose to glucagon which is stored in the pancreas

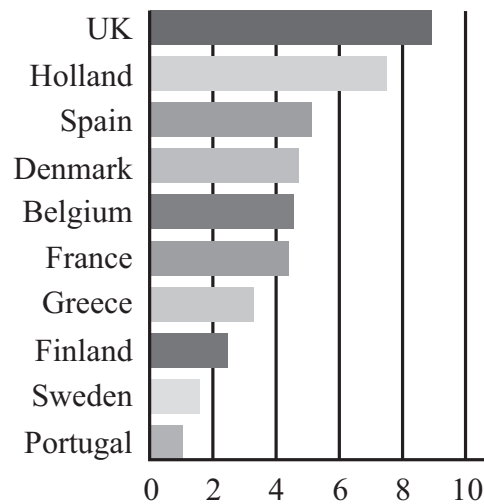
28. Most insulin used by diabetics is made by genetically modified (GM) bacteria. Which of these statements are benefits of using insulin produced by GM bacteria?
- 1 insulin made by GM bacteria is less likely to have side effects than insulin extracted from pigs
 - 2 insulin is less likely to be rejected as it is produced using human DNA in GM bacteria
- A 1 only
 B 2 only
 C both 1 and 2
 D neither 1 nor 2

Cannabis usage

29. The bar charts show the cannabis usage of 15 to 16 year olds and adults during 2007 in some European countries.



percentage of 15 to 16 year olds who admit having used cannabis in 2007



percentage of adults who admit using cannabis in 2007

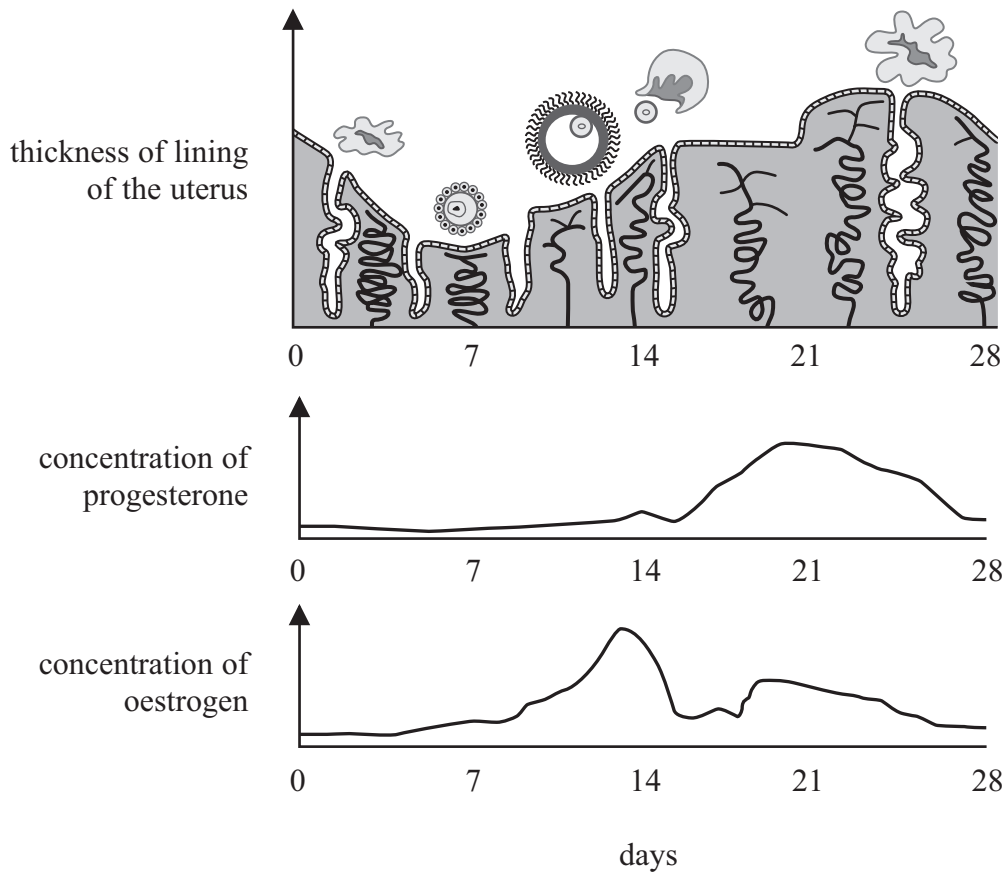
Which statement is true about the data in the bar charts?

- A in each country a greater percentage of adults have used cannabis than 15 to 16 year olds
 B the percentage of adults using cannabis in the UK is half that of Belgium
 C in each country a greater percentage of 15 to 16 year olds have used cannabis than adults
 D the use of cannabis in Holland is greater than in all the other countries

- 30.** Cannabis can be smoked with tobacco.
What are the dangers of smoking tobacco?
- A** cannabinoids are addictive and cause cancer
 - B** nicotine is addictive and tar causes cancer
 - C** nicotine causes lung cancer
 - D** carbon monoxide gas causes lung cancer
- 31.** Medical research indicates that using cannabinoids can cause
- A** Parkinson's disease
 - B** epilepsy
 - C** psychosis
 - D** strokes
- 32.** The region of the brain associated with memory and thinking is the
- A** cerebellum
 - B** cerebral cortex
 - C** medulla
 - D** pituitary gland

The menstrual cycle

Use the diagram to help you answer questions 33 and 34.

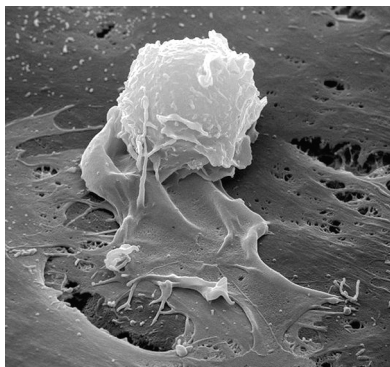


33. What is the main effect of a large and sudden increase in oestrogen concentrations?
- A menstruation
 - B pregnancy
 - C implantation
 - D ovulation
34. What does the reduction in progesterone concentration at the end of the menstrual cycle cause?
- A the lining of the uterus to build up in preparation for pregnancy
 - B the lining of the uterus to break down and menstruation to occur
 - C the follicle to release an egg cell for fertilisation to occur
 - D the follicle to mature many egg cells in preparation for IVF

35. Which two hormones are most commonly given to women who are having fertility treatments?
- A oestrogen and FSH
 - B FSH and LH
 - C LH and progesterone
 - D progesterone and oestrogen
36. IVF treatment can be given to women to help them become pregnant. IVF treatment involves
- A the use of hormones and *in vivo* fertilisation
 - B the use of enzymes and *in vivo* fertilisation
 - C the use of hormones and *in vitro* fertilisation
 - D the use of enzymes and *in vitro* fertilisation

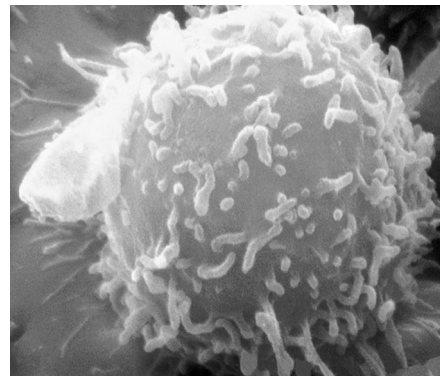
The immune system

The immune system is controlled by white blood cells. There are two types of white blood cells.



phagocyte

David M. Phillips/Science Photo Library



lymphocyte

Science Source/Science Photo Library

37. Phagocytes form part of the second line of defence against disease. What is the role of the phagocytes?
- A to form a barrier to stop bacteria and other organisms entering the body
 - B to produce the chemical lysozyme to destroy bacteria
 - C to produce antigens as part of the specific immune response
 - D to engulf and ingest harmful bacteria in the body

38. The lymphocytes form part of the third line of defence.
What is the role of the lymphocytes?
- A to produce antibodies which are specific to an antigen
 - B to engulf and destroy invasive pathogens
 - C to be part of the immune system producing specific antigens
 - D to control the inflammatory response and assist in wound healing
39. Tuberculosis (TB) is a disease which can be controlled by the immune system.
Which row of the table is correct for the TB microorganism and its transmission?

	type of microorganism	transmission
A	virus	droplets in the air
B	virus	insect vector
C	bacterium	insect vector
D	bacterium	droplets in the air

40. Which of these statements about TB and the immune system are true?
- 1 TB can be controlled by taking multiple antibiotics which work with the immune system to destroy the microorganism that causes TB
 - 2 the emergence of drug resistant TB means that no antibiotics can control the disease
- A 1 only
 - B 2 only
 - C both 1 and 2
 - D neither 1 nor 2

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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