

Surname	Initial(s)
Signature	

Paper Reference(s)

**5006**

# Edexcel GCSE

## Science

Biology B1b

Topic 3: Electrical and Chemical Signals

Topic 4: Use, Misuse and Abuse

**Foundation and Higher Tiers**

Monday 12 March 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.

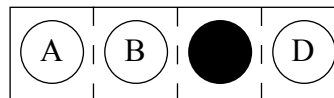
### **Before the test begins:**

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.

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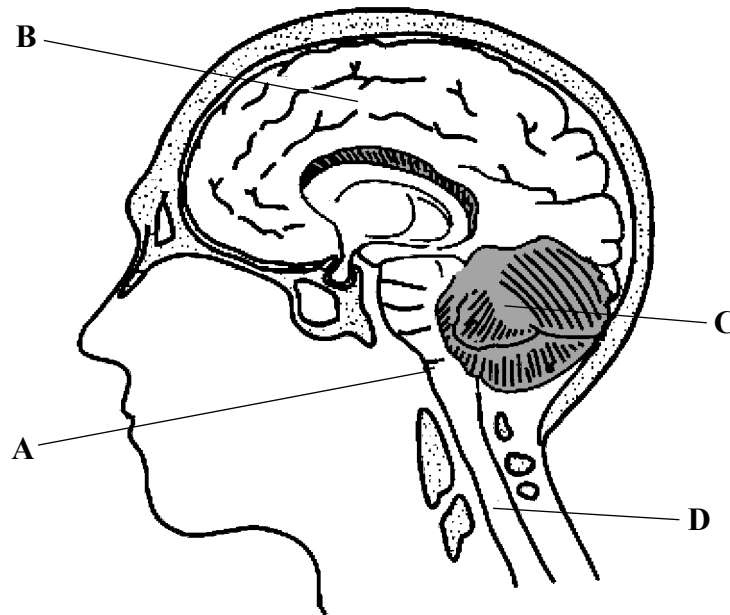
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Questions 1 to 16 must be answered by Foundation tier candidates only.  
Higher tier candidates start at question 17.

## Brain

The diagram shows the brain inside a human skull.

1. Which part helps you to remember?



2. Your brain is part of the central

- A nervous system
- B reflex system
- C control system
- D response system

3. The brain is mostly made from

- A bone
- B muscle
- C neurones
- D skin

4. The pituitary gland releases hormones.  
These hormones carry

- A electrical messages
- B chemical messages
- C receptor messages
- D effector messages

## IVF

More older women are using IVF.

5. The letters IVF stand for

- A in vitro fertilisation
- B inter-vaginal fertilisation
- C in vivo fertilisation
- D it's very fertilising

6. During IVF an egg is fertilised to produce a zygote.  
Which row of the table shows the name of the cell that fertilises the egg and the place where it is fertilised?

	name of cell	name of place
A	egg	uterus
B	egg	glass dish
C	sperm	uterus
D	sperm	glass dish

7. 6 000 babies a year are born in the UK by using IVF.  
This is a success rate of 15%.  
How many babies a year would be born if the success rate increased to 30%?

- A 15
- B 30
- C 3 000
- D 12 000

8. IVF treatment uses drugs to produce more eggs.  
These drugs are called

- A stimulants
- B hormones
- C antibiotics
- D sedatives

## Is red wine good for you?

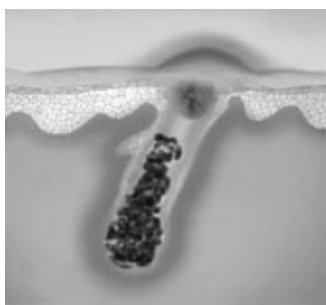
### Alcohol is once again in the news

There is evidence to show that moderate, but not heavy, drinking of red wine may delay the onset of age related deafness.

9. The above article refers to moderate drinking.  
How many glasses of wine is a moderate drinker likely to consume in one day?
- A none
  - B 1 – 2
  - C 6 – 8
  - D more than 8
10. Heavy drinking can damage some organs in the body.  
The organs most likely to be damaged are the
- A brain and lungs
  - B brain and liver
  - C heart and lungs
  - D lungs and liver
11. Drinking two glasses of wine is likely to put a person over the legal limit for driving in Britain.  
There is a legal limit because alcohol
- A increases the time it takes a person to react
  - B decreases the time it takes a person to react
  - C increases the risk of viral infections
  - D decreases the risk of viral infections
12. Alcohol is a drug.  
Which of the following is **not** a drug?
- A aspirin
  - B caffeine
  - C opium
  - D lysozyme

## Spots

The picture shows a section through the skin at the site of a spot. The area around the spot has become swollen and painful.

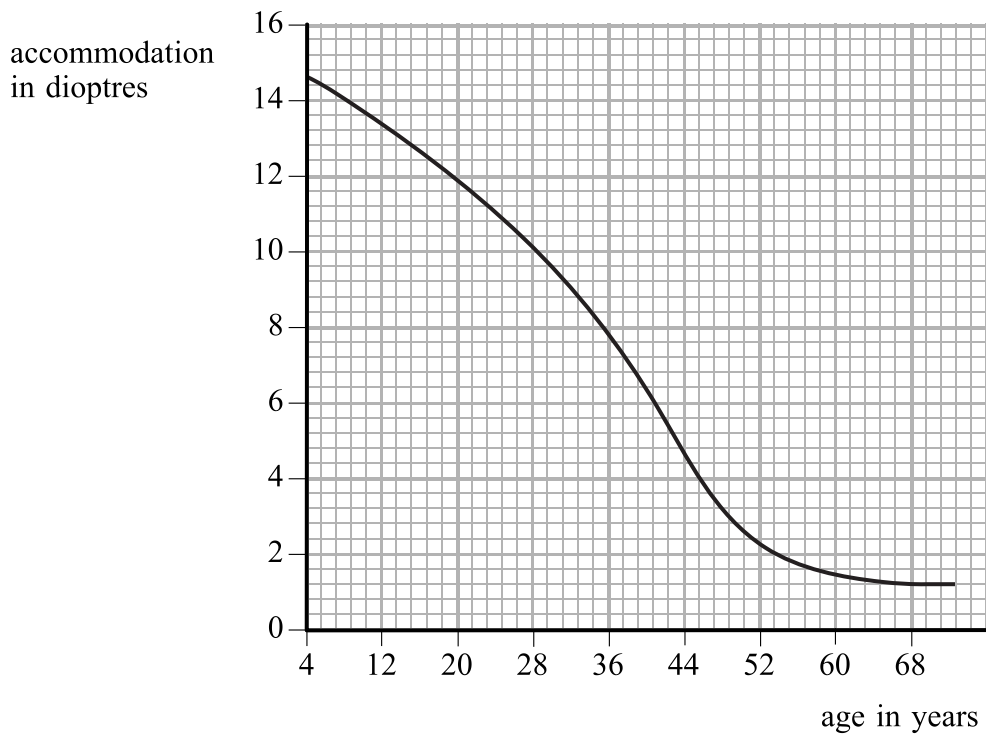


13. The swelling is an example of
- A a pathogenic response
  - B a bacterial response
  - C an inflammatory response
  - D a microbial response
14. The cells involved in this type of response are
- A red blood cells
  - B white blood cells
  - C platelets
  - D muscle cells
15. A single bacterium divides into two every 20 minutes.  
How long would it take for a single bacterium to produce more than 100 bacteria?
- A 20 mins
  - B 1 hour
  - C 1 hour 20 mins
  - D 2 hours 20 mins
16. Bacteria can cause disease.  
What is the general name for a disease-causing organism?
- A antigen
  - B antibody
  - C vector
  - D pathogen

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

### Accommodation

The graph shows how accommodation in the eye changes with age.



17. The graph suggests that accommodation

- A decreases with age
- B increases with age
- C improves with age
- D stays the same with age

18. Accommodation

- A increases iris size
- B decreases iris size
- C changes lens thickness
- D changes the retina

19. Accommodation is a reflex response.  
This means that accommodation is
- A voluntary and slow
  - B voluntary and fast
  - C involuntary and slow
  - D involuntary and fast
20. One reflex response in the eye involves changes to the iris.  
The stimulus that brings about this iris reflex is
- A light
  - B touch
  - C heat
  - D pressure

### Cannabis

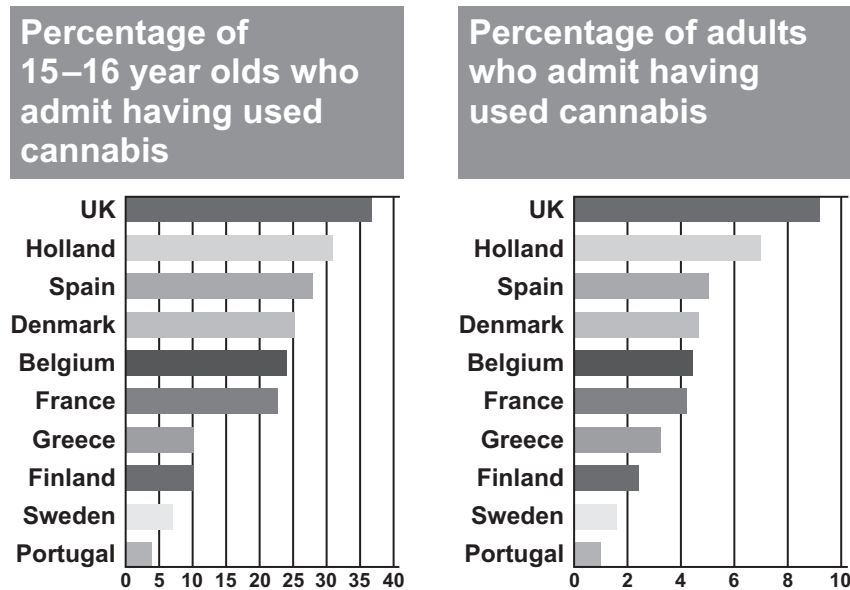
Doctors can prescribe cannabis as a medicine for patients who have Parkinson's disease. Cannabis is illegal to use as a social drug in Britain.



21. Cannabis can be smoked with tobacco when used as a social drug.  
This increases the dangers of using the drug because tobacco
- A contains tar which may damage your lungs
  - B has a sedative effect
  - C makes the cannabis less addictive
  - D increases the risk of viral infections
22. Cannabis may be given to terminally ill patients.  
This is because cannabis
- A acts as a stimulant on the nervous system
  - B is addictive
  - C relieves pain
  - D increases life expectancy

Use this information to answer questions 23 and 24.

The graph shows the percentages of 15–16 year old teenagers and of adults in Europe who admitted to having used cannabis during 2004.



23. What percentage of adults in Holland admitted to using cannabis in 2004?
- A 7%
  - B 9%
  - C 31%
  - D 36%
24. How many of these countries had a higher percentage of 15–16 year olds using cannabis than adults?
- A 0
  - B 3
  - C 6
  - D 10

**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.**

### **Nasal hair**

Nasal hair may look odd but it helps to prevent infection within the human body. Cilia have a similar function.



*'A rotary nasal-hair trimmer!  
However did you guess?'*

Source: [www.CartoonStock.com](http://www.CartoonStock.com)

25. What is the function of nasal hair?
- A to protect the body from water borne microbes
  - B to be part of the first line of defence against infection
  - C to be part of the second line of defence against infection
  - D to cause the production of excess mucus
26. Cilia are affected by smoking.  
This is because the
- A smoke is hot and burns the cilia
  - B nicotine in the tobacco clogs up the cilia
  - C tar in the tobacco stops the cilia from moving
  - D nicotine is a stimulant and causes the cilia to move too fast
27. Another way in which the body prevents infection is by producing chemicals such as lysozyme.  
Lysozyme is
- A a chemical barrier
  - B a physical barrier
  - C a chemical and a physical barrier
  - D neither a chemical nor a physical barrier
28. The body's largest physical barrier in the defence against infection is also the largest organ of the body.  
What is the name of this organ?
- A blood
  - B brain
  - C liver
  - D skin

## Malaria

The picture shows a mosquito. This mosquito causes the transfer of the malaria microbes into humans.



29. What is the name given to this method of disease transmission?
- A bacterial transmission
  - B direct contact
  - C vector borne
  - D vertical contact
30. A man is bitten by a mosquito carrying the malaria microbe. What is the immediate response of his **non-specific** immune system?
- A White blood cells produce antitoxins
  - B Cilia move the infection to the back of the throat
  - C The area surrounding the bite becomes inflamed
  - D Lysozyme cleans the area of infection
31. What would be the **specific** immune response to the presence of this infection?
- A antibody production by the red blood cells
  - B antibody production by the white blood cells
  - C antigen production by red blood cells
  - D antigen production by white blood cells
32. Malarial microbes are protoctists. What type of microbes cause the disease tuberculosis (TB)?
- A bacteria
  - B fungi
  - C protoctists
  - D viruses

## Insulin

Some people cannot make insulin.

33. People who cannot make insulin are
- A diabetic
  - B epileptic
  - C infertile
  - D glycaemic
34. Insulin converts
- A glycogen to glucose
  - B glucagon to glucose
  - C glucose to glycogen
  - D glucose to glucagon
35. Human insulin is made in large quantities by using genetically modified
- A viruses
  - B human cells
  - C pigs
  - D bacteria
36. It is better to use human insulin rather than insulin obtained from animals because
- A there are fewer side effects
  - B fewer animals are killed
  - C it travels more easily in the blood
  - D it is easier to digest

## TB outbreak

A hospital worker has been diagnosed with TB. 213 young children are thought to have come into contact with her and have been asked to report to the hospital for screening.

37. Tuberculosis (TB) is spread by
- A direct vertical contact
  - B sexual transmission
  - C insect vector
  - D droplets in the air
38. Before 1980 TB was almost wiped out in the UK. As a result of this, fewer people have been immunised against TB. The likely outcome of this reduction in immunisation is
- A the development of a new drug to combat TB
  - B an increase in the number of cases of TB
  - C that the number of cases of TB will be unaffected
  - D the emergence of more drug-resistant TB
39. TB is becoming more difficult to treat. What is the most likely reason for this?
- A Hospitals are unable to cope with the large numbers of cases of TB
  - B Cases of TB are not recognised as people generally recover without drugs
  - C The new strains of TB are more resistant to drugs
  - D People travel more and are more likely to contract TB
40. Here are two statements about drug companies and TB.
- 1 Drug companies do not need to research into drugs that treat TB as the disease has been virtually wiped out.
  - 2 Research into a new drug is sometimes so costly it is not financially sound.
- Which are true?
- A 1 only
  - B 2 only
  - C both 1 and 2
  - D neither

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

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**END**