

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 20 June 2008 – 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.

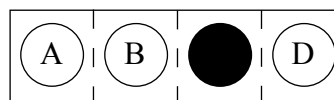
### **Before the test begins:**

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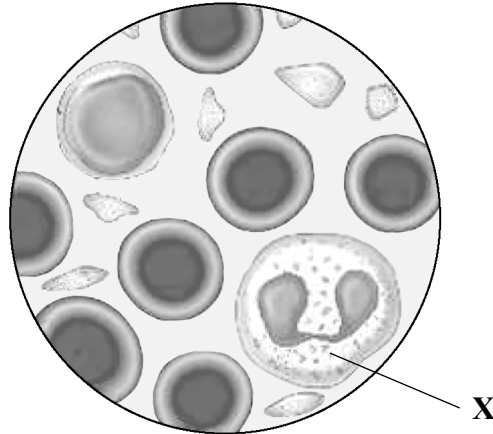
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**Questions 1 to 16 must be answered by Foundation tier candidates only.  
Higher tier candidates start at question 17.**

### **A Hospital Visit**

Amii was tired all the time. She had a blood sample taken at a hospital which was then examined under a microscope.

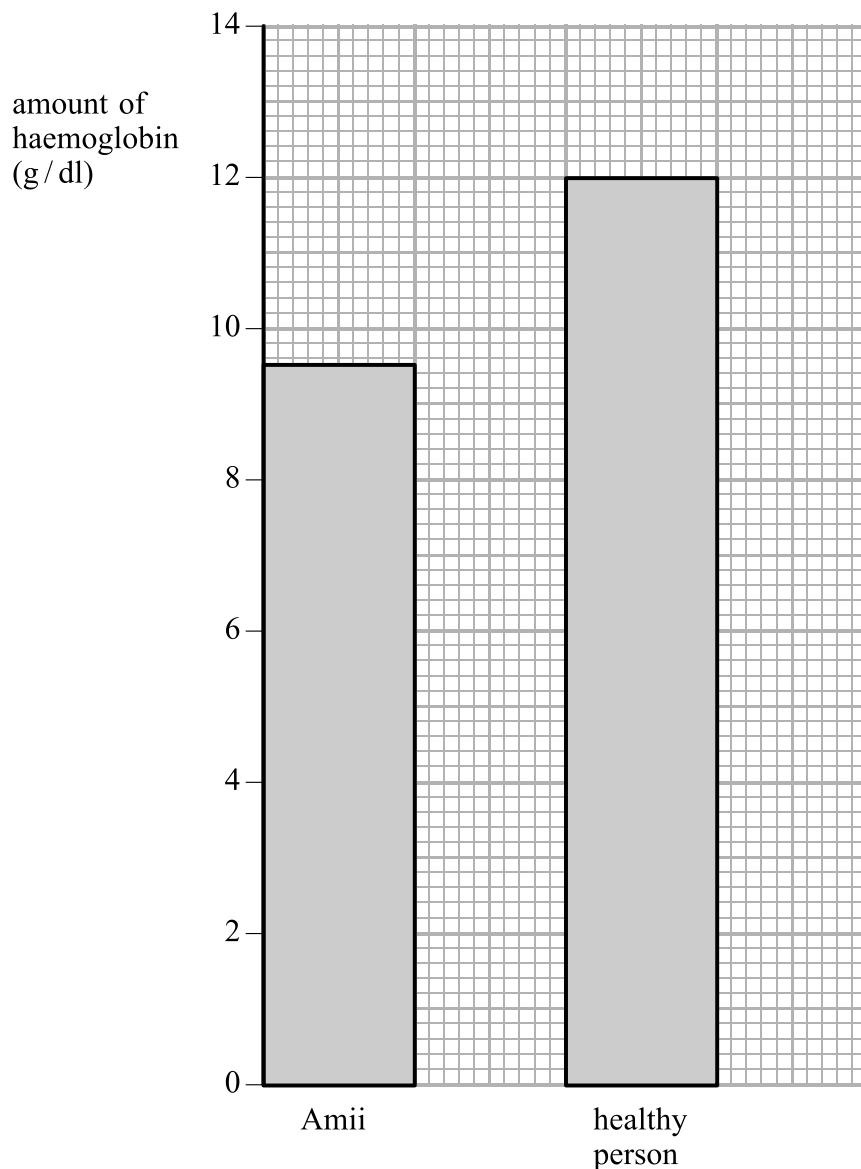
This is what was seen.



1. The cell labelled **X** is a
  - A** platelet
  - B** skin cell
  - C** red blood cell
  - D** white blood cell
  
2. Amii's doctor said that the reason she felt tired all of the time was because her red blood cells could not carry enough
  - A** oxygen
  - B** carbon dioxide
  - C** glucose
  - D** hormones

3. Amii's doctor said she should take iron tablets to make her feel better. The iron would be transported to her body cells by
- A platelets
  - B plasma
  - C red blood cells
  - D white blood cells

Red blood cells contain haemoglobin. The doctor compared the amount of haemoglobin in Amii's red blood cells to the amount in the red cells of a healthy person.



4. How much more haemoglobin did the healthy person's red blood cells contain compared to Amii's?
- A 2.5 g/dl
  - B 3.0 g/dl
  - C 9.5 g/dl
  - D 12.0 g/dl

## Britain bans smoking in public buildings (July 2007)

From 1st July 2007 smoking has been banned from public premises in Britain. This includes pubs, restaurants and railway stations. The reason for this change in legislation is to protect the people working in these environments.

*(Daily Mail)*

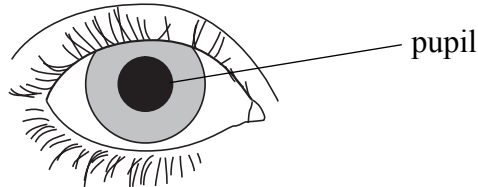
5. Which organ in the body is most affected by smoking tobacco?
- A liver
  - B lungs
  - C pancreas
  - D small intestine
6. The heart is also affected by smoking tobacco.  
What is the name of the organ system which includes the heart and bloodstream?
- A circulatory system
  - B digestive system
  - C pulmonary system
  - D reproductive system
7. Which harmful substance does tobacco contain?
- A antigens
  - B caffeine
  - C tar
  - D water
8. Many people who smoke find it difficult to give up.  
This is because
- A the tar in tobacco is addictive
  - B the nicotine in tobacco is addictive
  - C the tar in tobacco is a stimulant
  - D the nicotine in tobacco is a stimulant

## Eye Test

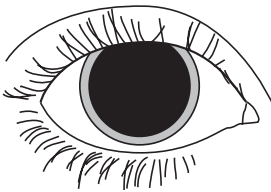
Charlie went to the opticians for an eye test. The optician shone a bright light into Charlie's eyes to see how they responded.

9. Diagram 1 shows Charlie's pupil before the optician shone the light into his eye.

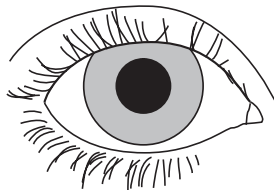
**Diagram 1**



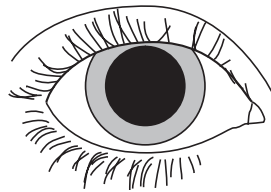
Which diagram shows Charlie's pupil when the optician shone the light into his eye?



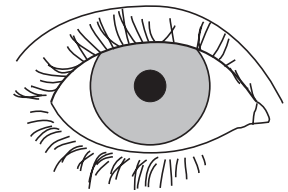
**A**



**B**



**C**

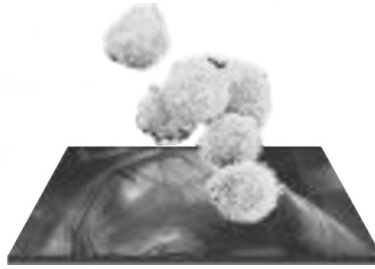


**D**

10. This response is known as the
- A** ducking reflex
  - B** pupil reflex
  - C** iris reflex
  - D** optic reflex
11. The stimulus that brings about this response is
- A** sound
  - B** touch
  - C** light
  - D** movement
12. Charlie's pupil responded because an impulse was sent from his brain to his eye. What type of neuron carried this impulse?
- A** motor neuron
  - B** sensory neuron
  - C** relay neuron
  - D** motor and sensory neuron

## White blood cells

This image of white blood cells was created from several images taken with an electron microscope.



13. An electron microscope can produce more realistic images than a light microscope. This is a benefit to scientists because
- A no detail can be seen with a light microscope
  - B cells can be studied in greater detail with an electron microscope
  - C cells can be altered using an electron microscope
  - D more detail can be studied using a light microscope
14. How is the structure of white blood cells suited to their function?
- A they are large and can block the walls of arteries
  - B they contain fibrin to seal cuts
  - C they can change shape to engulf bacteria
  - D they have a large surface area to carry oxygen
15. What is another function of white blood cells?
- A the production of antibodies
  - B the production of antigens
  - C the production of pathogens
  - D the production of cilia
16. The body is protected from microorganisms by physical barriers. Which part of the body is **not** a physical barrier to microorganisms?
- A skin
  - B cilia
  - C nasal hairs
  - D lysozyme

**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.**

### **Disease in Britain**

There are many diseases in Britain caused by microorganisms.

17. A disease-causing organism is
- A a drug
  - B an antigen
  - C a pathogen
  - D a vector
18. Overcrowding can make disease more likely because
- A all diseases are contagious
  - B disease is more easily transferred
  - C the immune system is weakened
  - D it leads to a poor diet
19. A disease which is increasing once again in Britain is tuberculosis (TB).  
What type of organism causes TB?
- A bacterium
  - B fungus
  - C protozoan
  - D virus
20. TB is spread through
- A badly cooked food
  - B contaminated water
  - C an insect vector
  - D droplets in the air

## Making Babies

Louise Brown was born in 1978.

Her birth made international news.

Louise's parents were the first couple to undergo IVF treatment, making Louise the world's first test tube baby.

21. The following statements show the stages involved in IVF but they are not in the correct order.

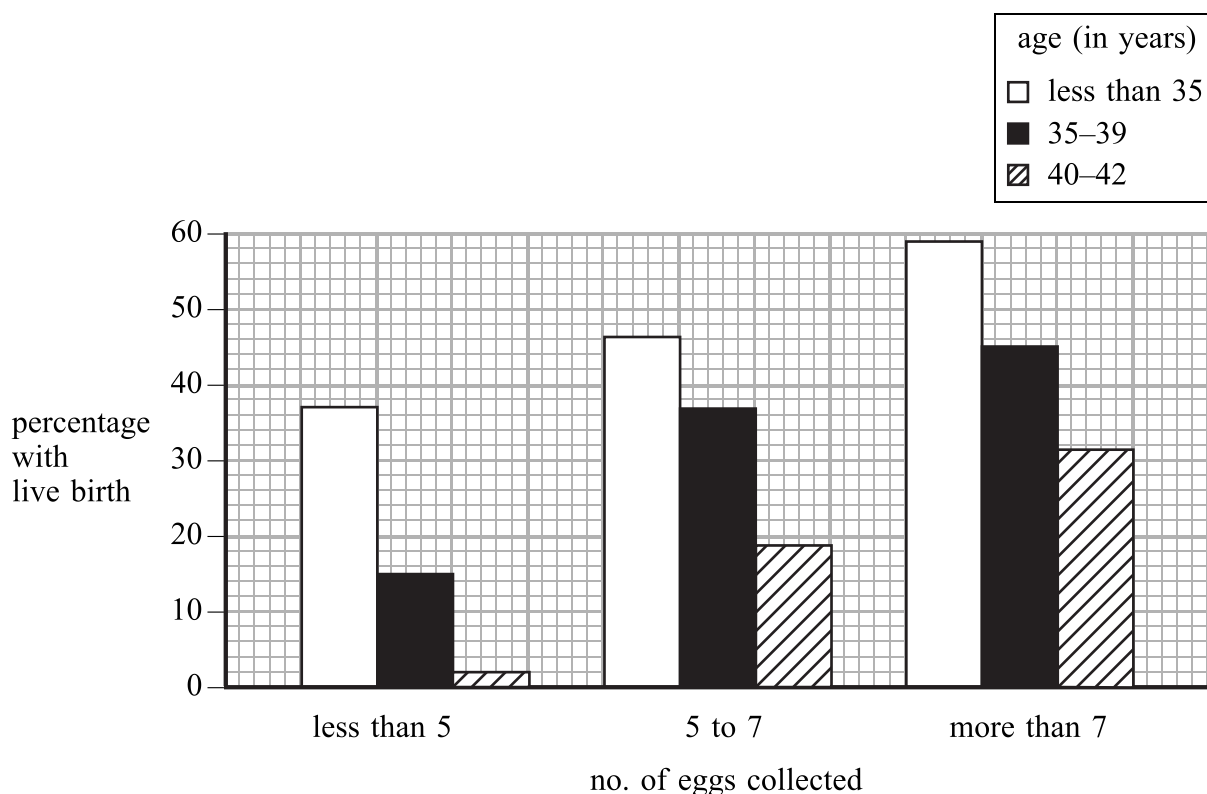
- 1 The embryo is inserted into the uterus
- 2 Eggs are collected from the ovaries
- 3 Sperm are mixed with the eggs
- 4 A woman is injected with a fertility hormone
- 5 An egg is fertilised and develops into an embryo

The correct order of these statements is

- A** 2-3-5-1-4  
**B** 4-2-3-5-1  
**C** 4-3-2-5-1  
**D** 5-1-2-3-4
22. Using sex hormones to prevent pregnancy is known as
- A** constipation  
**B** ovulation  
**C** contraception  
**D** infertility

The graph shows the success rate of IVF in women.

The women are put into groups based on their age and the number of eggs collected from their ovaries.



23. Evidence from the graph suggests that IVF is
- A more successful for women as their age increases regardless of the number of eggs collected
  - B more successful for women of all age groups the more eggs collected
  - C less successful for women of all age groups the more eggs collected
  - D more successful for women of all age groups the fewer eggs collected
24. Some people argue that IVF should only be given to women below the age of 50. The most likely reason for this is because older women
- A are more likely to get pregnant without IVF
  - B do not have enough money to look after a child
  - C are more likely to have successful pregnancies
  - D are more likely to become ill

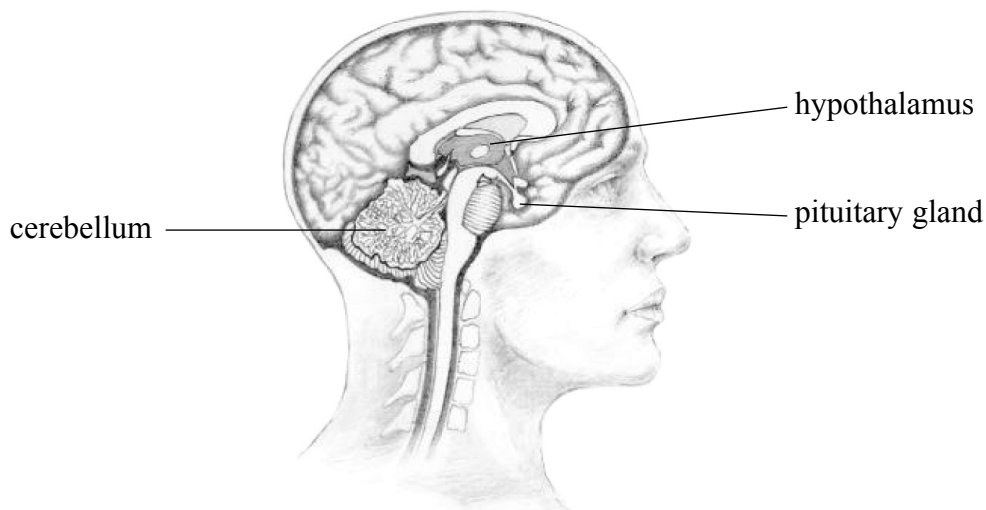
**TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS**

**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 Nervous System

The diagram shows the structure of the human brain.



25. The brain is part of the nervous system.  
It contains

- A sensory and motor neurones only
- B motor and relay neurones only
- C sensory and relay neurones only
- D sensory, motor and relay neurones

26. Different parts of the brain are responsible for different body functions.  
Which row of the table shows the correct parts of the brain responsible for body temperature and movement?

	body temperature	body movement
A	hypothalamus	pituitary gland
B	pituitary gland	hypothalamus
C	hypothalamus	cerebellum
D	cerebellum	pituitary gland

27. Which statement shows how neurones communicate with each other across the synapse?

- A diffusion of chemical messages
- B diffusion of electrical signals
- C conduction of electrical signals
- D conduction of chemical messages

28. The statements below give some actions carried out by our body.

- we smile when we are happy
- we cough if something gets stuck in our throat
- we run to catch a bus
- we blink if dust gets in our eye

How many of the statements describe reflex actions?

- A one
- B two
- C three
- D four

## 2012 Olympics

There is a lot of discussion about how to control the use of performance enhancing drugs in the 2012 Olympics.

Caffeine in large doses is one of the drugs being considered for the banned list.

29. What properties of caffeine make it likely to act as a performance enhancing drug?

- A it is a stimulant which enables athletes to train for longer
- B it is a stimulant which makes athletes more alert
- C it is a barbiturate which enables athletes to train for longer
- D it is a barbiturate which makes athletes more alert

30. Which row of the table correctly describes the effect of caffeine on the body?

	reaction time	heart rate
A	increases	increases
B	increases	decreases
C	decreases	increases
D	decreases	decreases

31. The misuse of solvents is banned because they can damage the myelin sheath surrounding the neurone.

The effect of this damage on the neurone is that

- A chemical messages are transferred faster
- B electrical impulses are transferred faster
- C chemical messages are transmitted less effectively
- D electrical impulses are transmitted less effectively

32. Other banned substances include steroids and cannabis.

Steroids allow athletes to train harder for longer. Steroids have side effects similar to cannabis.

A side effect of both steroids and cannabis is

- A a decrease in reaction time
- B an increase in pain
- C mood changes
- D an increase in viral infections

## The Change of Life

The menopause is a normal change in a woman's life.

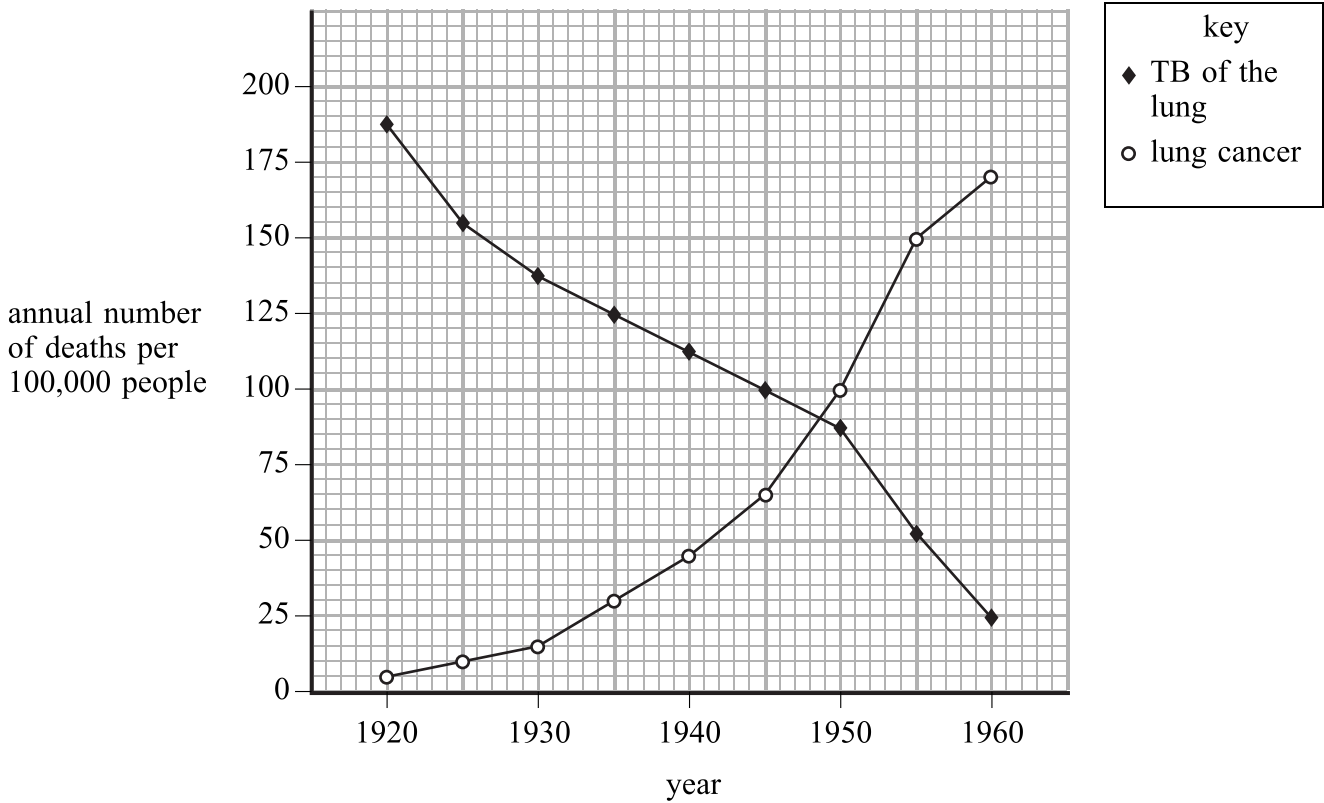
During the menopause, menstruation gradually stops as she produces less oestrogen, progesterone and luteinising hormone (LH).

Levels of Follicle Stimulating Hormone (FSH), however, remain high.

33. What effect will lower levels of oestrogen and progesterone have on the female menstrual cycle during the menopause?
- A the uterus lining breaks down prematurely
  - B the uterus lining remains built up
  - C a greater number of egg follicles mature
  - D egg follicles become less sensitive to FSH
34. Lower levels of LH may prevent
- A the release of FSH
  - B the repair of the uterus lining
  - C ovulation
  - D a rise in oestrogen levels
35. FSH is released from
- A the adrenal gland
  - B the pancreas
  - C the thyroid gland
  - D the pituitary gland
36. FSH is a hormone that is also used
- A in the contraceptive pill to prevent pregnancy
  - B for fertility treatment to stimulate the development of eggs
  - C in IVF to increase the chances of an embryo forming
  - D for the treatment of diabetes to regulate blood sugar levels

### Tuberculosis (TB) and lung cancer

The graph shows the changes in the number of deaths from TB and lung cancer between 1920 and 1960.



37. What best describes the trends shown in the graph?

- A TB and lung cancer both show a negative correlation
- B TB and lung cancer both show a positive correlation
- C TB shows a positive correlation and lung cancer a negative correlation
- D TB shows a negative correlation and lung cancer a positive correlation

38. The population in 1935 was 8 million.  
How many people died from TB during 1935?

- A 125
- B 1000
- C 1250
- D 10 000

39. Since 1960 the incidence of TB has increased dramatically in some parts of the country. What is the most likely reason for this increase?
- A the development of multi-antibiotics to treat sufferers
  - B the use of DOTS (directly observed treatment short course)
  - C a greater amount of food is imported from abroad
  - D the emergence of a drug resistant form of the TB bacteria

40. The cost of developing a new drug to treat TB may be £500 million or more. This is because drug development has to go through several stages.

Put the stages in the correct order.

- 1 human volunteers trial the drugs
- 2 chemicals are tested and developed
- 3 animals trial the drugs
- 4 the drug is registered with the regulatory authority
- 5 possible chemicals are identified

- A 5-2-4-3-1
- B 5-2-4-1-3
- C 5-4-2-3-1
- D 5-2-3-1-4

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

**END**

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