Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Centre Number | | | | | |

Candidate Number | | | | |

Mock Set 2 – Autumn 2018

Time: 1 hour 45 minutes

Paper Reference **1BI0/1H**

Biology

Paper 1

Higher Tier

You must have:
Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- Calculators may be used.
- Any diagrams may NOT be accurately drawn, unless otherwise indicated.
- You must **show all your working out** with **your answer clearly identified** at the **end of your solution**.

Information

- The total mark for this paper is 100.
- The marks for each question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- In questions marked with an **asterisk** (*), marks will be awarded for your ability to structure your answer logically showing how the points that you make are related or follow on from each other where appropriate.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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Pearson

Answer ALL questions. Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒.
If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 (a) The energy content of food can be compared using the equipment shown in Figure 1.

A student burnt one type of potato snack on the mounted needle.

The start and end temperatures of the water were recorded.

This method was repeated with two other types of potato snack.

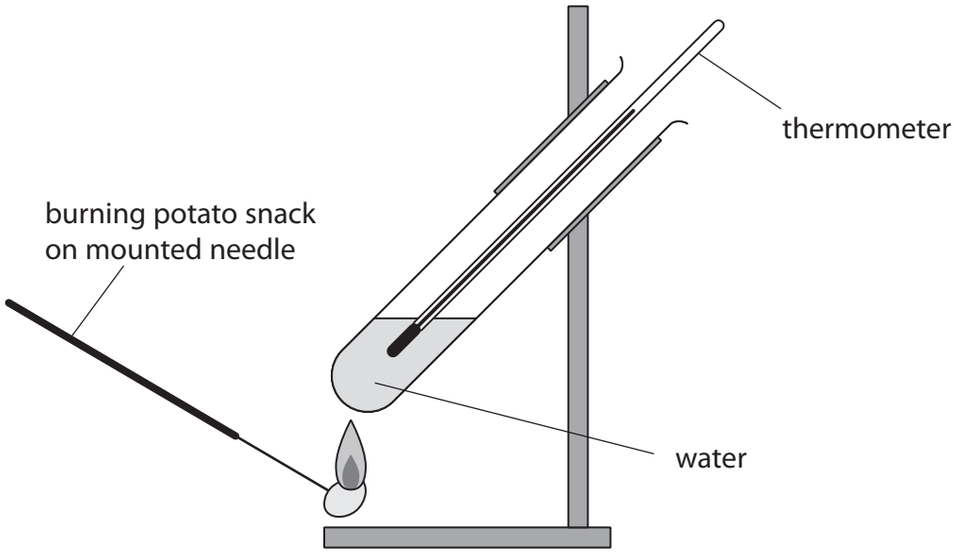


Figure 1

(i) Which process is shown in Figure 1?

(1)

☒ **A** calorimetry

☒ **B** osmosis

☒ **C** active transport

☒ **D** specificity

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(ii) Explain how weighing each of the potato snacks would improve the method.

(2)

(iii) Figure 2 shows the start and end temperature of the water for the three types of potato snack.

type of potato snack	start temperature of the water in °C	end temperature of the water in °C
A	21	28
B	22	31
C	24	32

Figure 2

Explain the conclusion the student can make about the energy content of the three types of potato snack.

(2)

(b) Explain how the student could compare the reducing sugar content of the potato snacks.

(2)

(Total for Question 1 = 7 marks)

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2 (a) Conjunctivitis is an eye infection caused by bacteria or viruses.

This infection causes the eye to become red and sore.

Figure 3 shows a healthy eye and an eye with conjunctivitis.

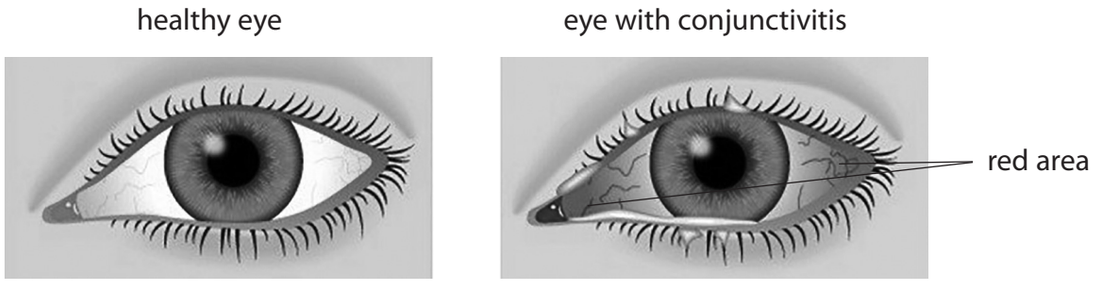


Figure 3

(i) A doctor prescribed antibiotics for a patient with conjunctivitis in one eye.

After four days the eye was still red and sore.

Give **one** reason why the antibiotics were not effective.

(1)

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(ii) Conjunctivitis can be spread from person to person.

Give **one** precaution a person with conjunctivitis should take to avoid spreading the infection.

(1)

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(iii) In one year there were 1.3 million confirmed cases of conjunctivitis.

85% of these cases were caused by bacteria.

Calculate the number of cases caused by bacteria.

(2)

..... cases

(iv) Most people with conjunctivitis recover without treatment.

Give **one** reason why treatment is not always required.

(1)

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(b) Pathogens cause tuberculosis and stomach ulcers.

(i) Which type of pathogen causes tuberculosis?

(1)

☒ **A** bacterium

☒ **B** fungus

☒ **C** protist

☒ **D** virus

(ii) Figure 4 shows the number of cases of stomach ulcers per 1000 men for different age ranges.

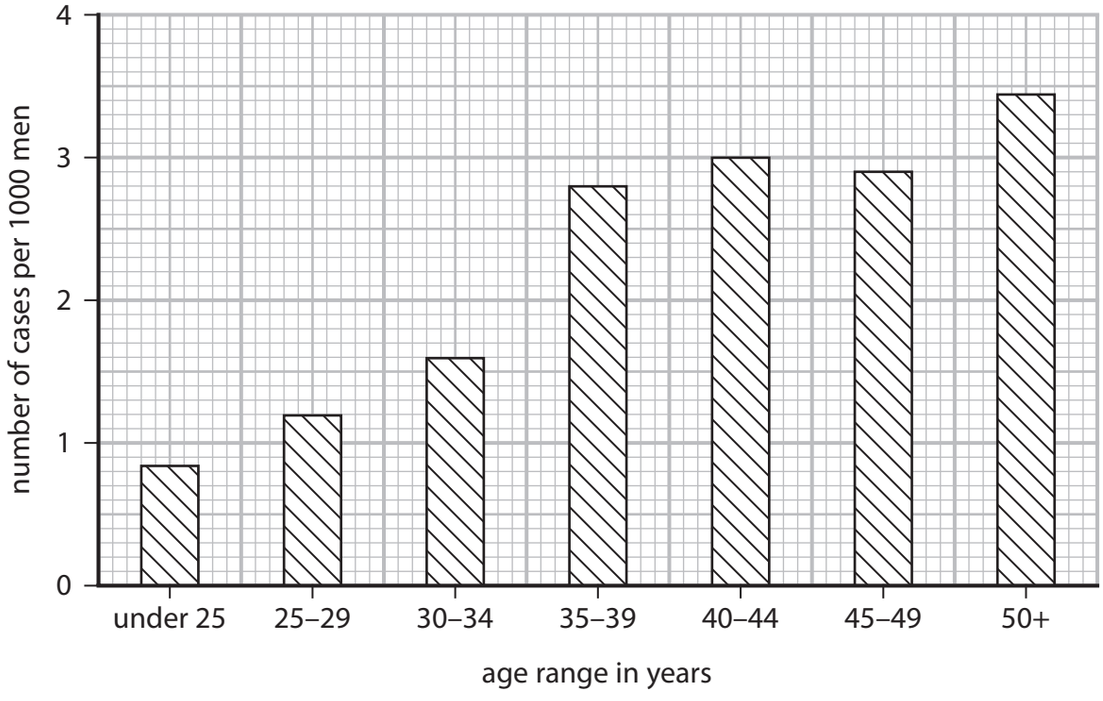


Figure 4

Describe the trend shown in Figure 4.

(1)

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(iii) In one region of the UK, there are 850 000 men in the age range 35–39 years.

Use Figure 4 to estimate the number of these men who have stomach ulcers.

(2)

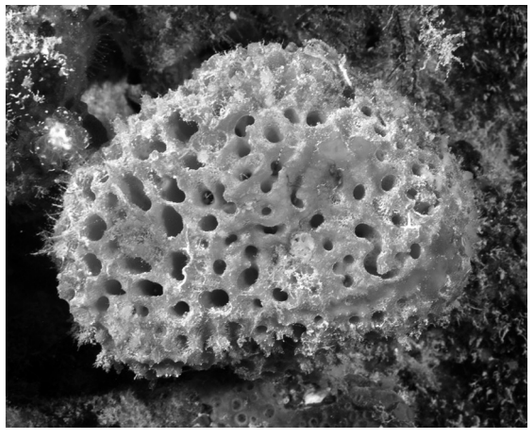
..... men

(Total for Question 2 = 9 marks)

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3 (a) Sponges are animals that live in water.

Figure 5 shows a sponge.



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Figure 5

(i) Sponges can reproduce both sexually and asexually.

Sexual reproduction uses cells produced by meiosis.

Describe the cells produced by meiosis.

(3)

(ii) Name the type of cell division used in asexual reproduction.

(1)

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(b) Sponges take in food particles from their environment.

The food particles are digested by enzymes inside the sponge.

(i) Explain how amino acids are produced from food particles.

(2)

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(ii) Name **one** process by which the amino acids can enter the cells of the sponge.

(1)

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(c) Sponges contain stem cells.

Explain how stem cells are involved in the growth of a sponge.

(2)

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(Total for Question 3 = 9 marks)

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4 (a) Figure 6 shows limbs from five animals.

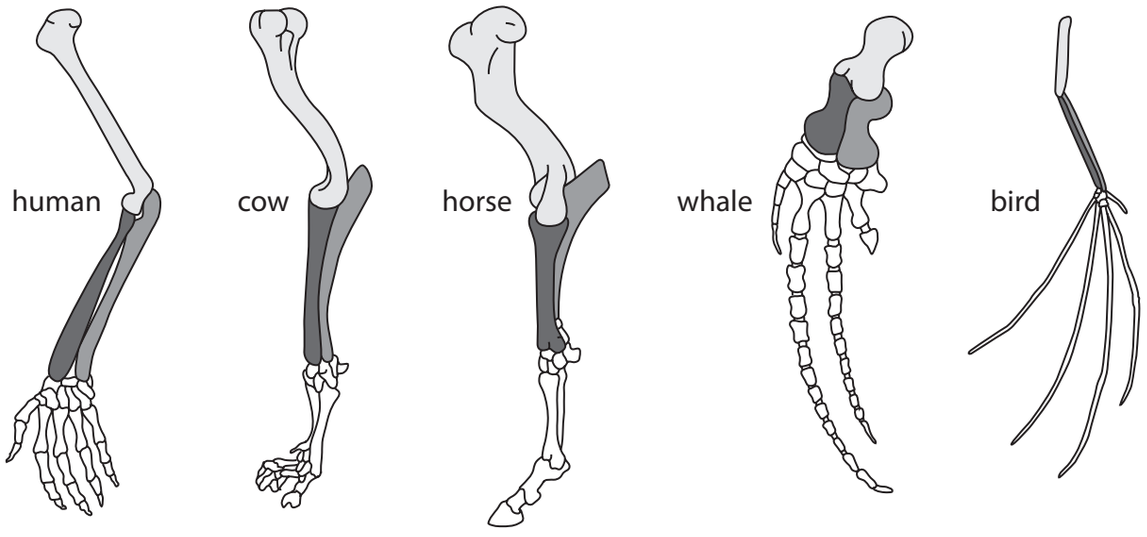


Figure 6

(i) All the limbs in Figure 6 have the same basic anatomy.

Name this type of limb.

(1)

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(ii) Describe how the structures of these limbs provide evidence for evolution.

(2)

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(iii) Describe how the structure of the bird's limb is adapted to its function.

(2)

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(b) Describe how Wallace and Darwin contributed to the theory of evolution.

(2)

(c) Explain the importance of sexual reproduction in evolution.

(4)

(Total for Question 4 = 11 marks)

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5 Polydactylism is a genetic condition that leads to a person having an extra finger or toe.

The extra digit is often small and not formed properly.

Polydactylism is caused by the inheritance of a dominant allele.

(a) A female who does not have polydactylism is having a child with a male who is heterozygous for polydactylism.

(i) Complete the Punnett square to show the possible offspring of these parents.

Use the letters D and d to show the alleles.

(2)

		male	
female			

(ii) Give the percentage probability of a child having polydactylism.

(1)

.....

(iii) Which term can be used to describe the genotype of the female who does not have polydactylism?

(1)

☒ **A** homozygous dominant

☒ **B** homozygous recessive

☒ **C** carrier

☒ **D** monohybrid

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(iv) This female and male have three children.

Two boys have polydactylism and one girl is unaffected.

Draw a family pedigree for this group of people.

(3)

(b) Give **two** reasons why the inheritance of most phenotypic features is not easy to predict.

(2)

1 .....

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2 .....

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(Total for Question 5 = 9 marks)

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6 (a) Figure 7 shows the speed of nerve impulses along myelinated axons of different diameters.

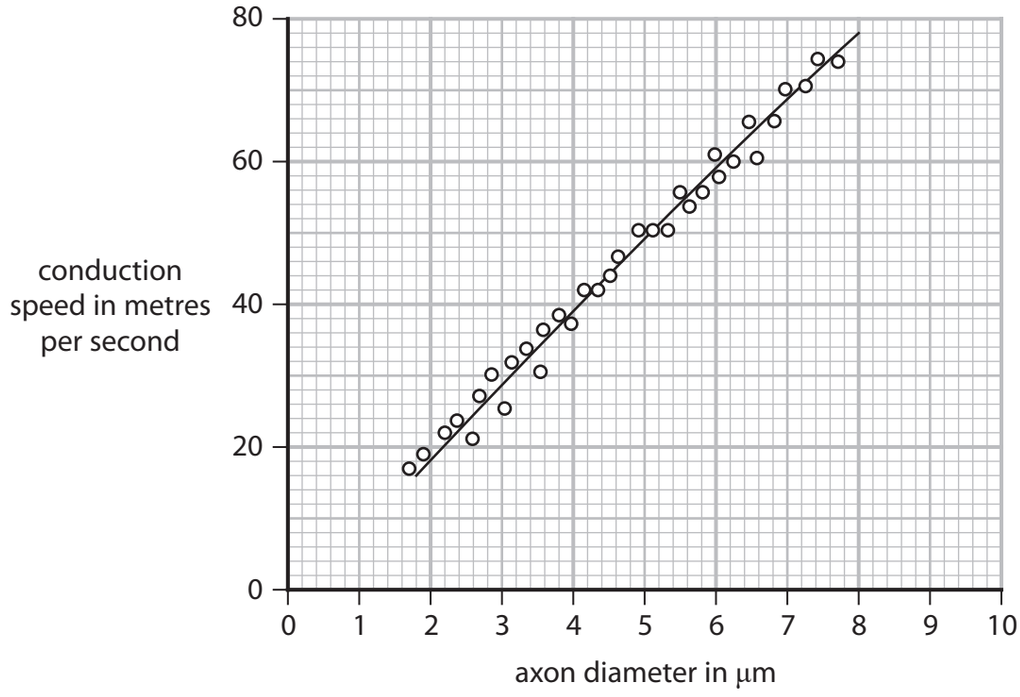


Figure 7

(i) Describe the trend shown in Figure 7.

(2)

(ii) Unmyelinated axons have mean conduction speeds ranging from 0.5 to 10 metres per second.

Explain the difference in conduction speed for the unmyelinated and myelinated axons.

(2)

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(b) When someone touches a very hot object a reflex action may cause them to move their hand away quickly.

Explain the role of a reflex arc in this response.

(4)

(c) A scientist investigated the effect of tiredness on reaction time in humans.

Devise a plan the scientist could use to test the effect of tiredness on reaction time.

(3)

(Total for Question 6 = 11 marks)

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7 (a) Figure 8 shows an MRI scan of a patient with a brain tumour.

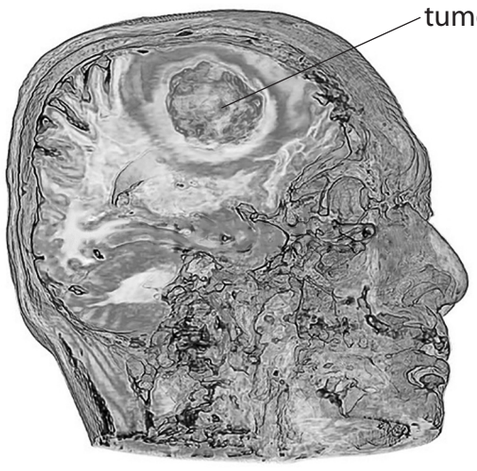


Figure 8

(i) Name the part of the brain with the tumour.

(1)

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(ii) Give **one** reason why treating brain tumours is difficult.

(1)

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(b) Explain how PET scanning can be used to detect cancer cells.

(3)

*(c) Explain how monoclonal antibodies could be made and used to treat the brain tumour shown in Figure 8.

(6)

(Total for Question 7 = 11 marks)

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8 A student investigated osmosis in root vegetables.

They cut three cubes from each vegetable.

Each cube had side lengths of 20 mm.

The mass of each cube was measured.

They placed each cube in a 2% solution of sodium chloride for 30 minutes.

The cubes were dried and the mass measured again.

Figure 9 shows the results.

vegetable	cube	starting mass (g)	final mass (g)	mass change (g)	percentage change in mass (%)
carrot	1	2.75	2.82	0.07	?
	2	2.91	2.99	0.08	2.7
	3	2.86	2.96	0.10	3.5
parsnip	1	2.70	2.65	–0.05	–1.9
	2	2.68	2.62	–0.06	–2.2
	3	2.82	2.71	–0.11	–3.9

Figure 9

(a) (i) Calculate the percentage change in the mass of cube 1 for the carrot.

(2)

.....%

(ii) Explain why the student dried the cubes before recording the final mass.

(2)

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(iii) Explain why the parsnip cubes lose mass.

(3)

(iv) The student repeats the investigation a week later using the same method.

Give **two** variables that they should control.

(2)

1

2

(v) The student had a 10% solution of sodium chloride.

Explain how the student made 100 cm^3 of the 2% solution of sodium chloride.

(2)

(Total for Question 8 = 11 marks)

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9 Figure 10 shows a bacterium that has been modified with gene A.

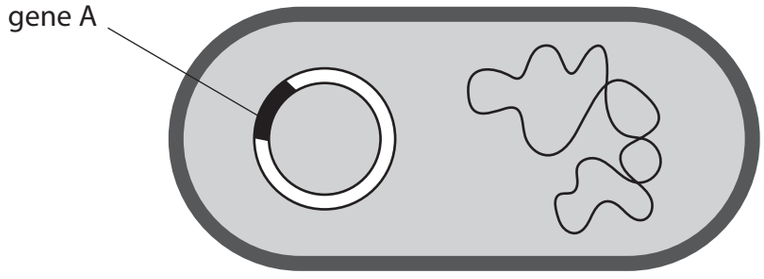


Figure 10

(a) Which term is used to describe all the genetic material of an organism?

(1)

☒ **A** chromosome

☒ **B** DNA

☒ **C** genome

☒ **D** genotype

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*(b) Explain how a gene from one organism can be inserted into a bacterium to produce a genetically modified bacterium.

(6)

(c) Gene A produces protein A.

Protein A is an antigen that can be used in a vaccine.

(i) Give **one** advantage of producing protein A using genetically modified bacteria.

(1)

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(ii) Explain why being vaccinated with protein A will stimulate immunity.

(3)

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10 Plant tissue and human tissue can be cloned to study the treatment of diseases.

A cauliflower plant can be cloned using the method outlined in Figure 11.

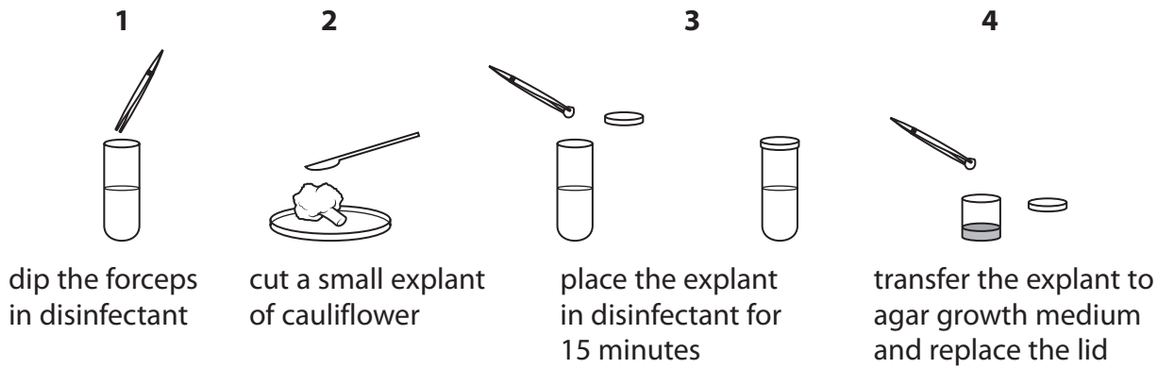


Figure 11

(a) (i) Which process is used to clone the cauliflower plant?

(1)

☒ **A** genetic engineering

☒ **B** selective breeding

☒ **C** tissue culture

☒ **D** biological control

(ii) Placing the forceps in disinfectant is an aseptic technique.

Explain another aseptic technique that could be used to improve the method shown in Figure 11.

(2)

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(iii) Which statement describes the advantages of cloning plants?

(1)

☒ **A** it produces variation and can be a quick process

☒ **B** it produces identical plants and can be a quick process

☒ **C** it produces variation and decreases genetic diversity

☒ **D** it produces identical plants and increases genetic diversity

(b) Cloning can also be used to produce human tissue.

A drug can be tested on human tissue before the drug is used in clinical trials.

(i) Give **one** advantage of testing a drug on human tissue before using this drug in clinical trials.

(1)

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(ii) Drugs have to be successful in clinical trials before they can be approved for general use.

Figure 12 shows the percentage of drugs approved for use in the treatment of five types of disease.

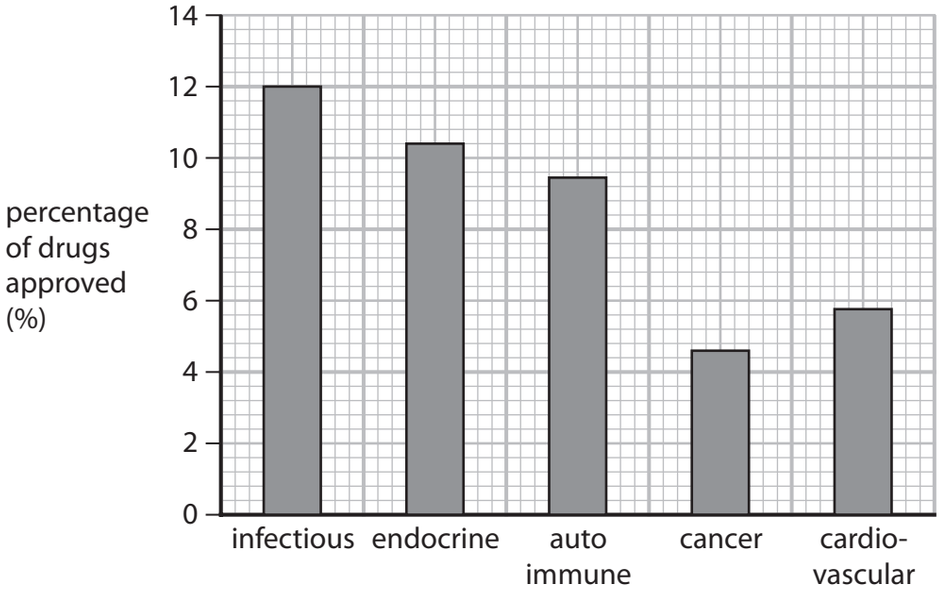


Figure 12

There are 90 drugs undergoing clinical trials for the treatment of cancer.

Estimate the number of drugs that could be approved for use.

(2)

..... drugs

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(c) A farmer noticed that in one field the crop plants were not growing very well.

Describe the methods used to find out if this poor growth is due to a plant disease.

(4)

(Total for Question 10 = 11 marks)

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