Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel Level 3 GCE

Monday 11 May 2026

Morning (Time: 1 hour 30 minutes)

Paper reference **8BN0/01**

Biology A (Salters Nuffield)

Advanced Subsidiary

PAPER 1: Lifestyle, Transport, Genes and Health

You must have:
Scientific calculator, HB pencil, 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.
- **Show all your working out** in calculations and **include units** where appropriate.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 80.
- 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 the question 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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P 7 9 0 7 8 A 0 1 2 8

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 Various risk factors can affect the risk of coronary heart disease in an individual.

The table shows some data from one adult that could be used to assess their risk of coronary heart disease.

BMI	28
waist : hip	0.95
units of alcohol	3 units a day

(a) The table shows BMI classifications.

BMI	Classification
<18.5	underweight
18.5 – 24.9	normal weight
25.0 – 29.9	overweight
$\geqslant 30.0$	obese

(i) What is the BMI classification for this adult?

(1)

☒ **A** underweight

☒ **B** normal weight

☒ **C** overweight

☒ **D** obese

(ii) Which of the following are used in the equation to calculate BMI?

(1)

☒	**A**	height	$mass^3$
☒	**B**	height	$mass^2$
☒	**C**	$height^2$	mass
☒	**D**	$height^2$	$mass^2$

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(b) The recommended alcohol intake is no more than 14 units a week.

A waist-to-hip ratio of more than 0.9 indicates abdominal obesity.

State and justify what conclusion can be made about the risk of coronary heart disease for this individual.

(1)

(c) Describe **two** other tests that could be carried out to assess the risk of coronary heart disease for this individual.

(2)

(Total for Question 1 = 5 marks)

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2 Transcription and translation are two processes that occur in cells.

(a) This sequence of bases is part of an mRNA strand.

AUG CUG GGG UUA AGU CAG ACG UAC

(i) Which DNA base sequence was transcribed to produce this part of the mRNA strand?

(1)

		DNA base sequence
☒	**A**	ATG CTG GGG TTA AGT CAG ACG TAC
☒	**B**	AUG CUG GGG UUA AGU CAG ACG UAC
☒	**C**	TAC GAC CCC AAT TCA GTC TGC ATG
☒	**D**	TUC GUC CCC UUT TCU GTC TGC UTG

(ii) Which of the following bonds joins the nucleotides together in a strand of mRNA?

(1)

☒ **A** disulfide

☒ **B** glycosidic

☒ **C** peptide

☒ **D** phosphodiester

(iii) Which row is correct for the process of transcription?

(1)

		location	enzyme involved
☒	**A**	cytoplasm	DNA polymerase
☒	**B**	cytoplasm	RNA polymerase
☒	**C**	nucleus	DNA polymerase
☒	**D**	nucleus	RNA polymerase

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(b) The table shows mRNA codons and the amino acids they code for.

Second Letter of Codon

First Letter of Codon	U	C	A	G	*Third* Letter of Codon
U	UUU Phe UUC Phe UUA Leu UUG Leu	UCU Ser UCC Ser UCA Ser UCG Ser	UAU Tyr UAC Tyr UAA Stop UAG Stop	UGU Cys UGC Cys UGA Stop UGG Trp	U C A G
C	CUU Leu CUC Leu CUA Leu CUG Leu	CCU Pro CCC Pro CCA Pro CCG Pro	CAU His CAC His CAA Gln CAG Gln	CGU Arg CGC Arg CGA Arg CGG Arg	U C A G
A	AUU Ile AUC Ile AUA Ile AUG Start	ACU Thr ACC Thr ACA Thr ACG Thr	AAU Asn AAC Asn AAA Lys AAG Lys	AGU Ser AGC Ser AGA Arg AGG Arg	U C A G
G	GUU Val GUC Val GUA Val GUG Val	GCU Ala GCC Ala GCA Ala GCG Ala	GAU Asp GAC Asp GAA Glu GAG Glu	GGU Gly GGC Gly GGA Gly GGG Gly	U C A G

(i) Complete the sequence of amino acids that would be translated from the mRNA base sequence shown in the table.

(1)

AUG	CUG	GGG	UUA	AGU	CAG	ACG	UAC
Start		Gly		Ser		Thr	Tyr

(ii) Explain how a mutation in the codon UUA could result in a **shortened** amino acid sequence.

(3)

(Total for Question 2 = 7 marks)

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3 The photograph shows a tubifex worm.



×12 magnification

(Source: © https://www.sciencephoto.com/media/583225/view)

Tubifex worms live in water and do not have a specialised gas exchange system.

Water contains dissolved oxygen.

(a) Explain why tubifex worms do not need a specialised gas exchange system.

(3)

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(b) Mammals are animals with specialised gas exchange systems.

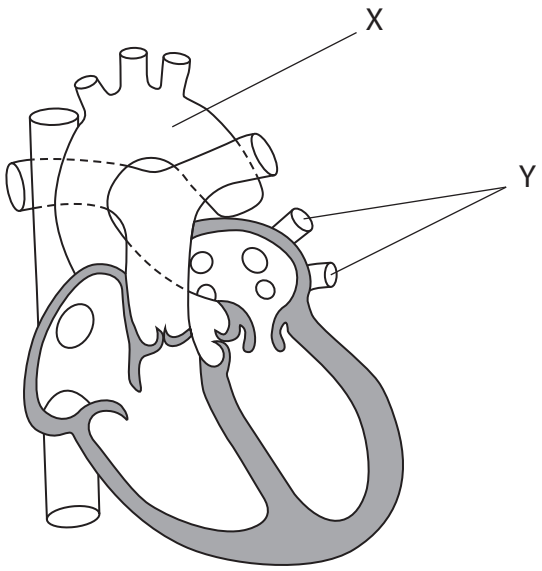
Explain how the mammalian lung is adapted for rapid gaseous exchange.

(4)

(Total for Question 3 = 7 marks)

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4 (a) The diagram shows the internal structure of a human heart.



(i) Which row is correct for structure Y?

(1)

		Name of blood vessel	Blood transported
☒	**A**	pulmonary artery	deoxygenated
☒	**B**	pulmonary artery	oxygenated
☒	**C**	pulmonary vein	deoxygenated
☒	**D**	pulmonary vein	oxygenated

(ii) Draw a labelled cross-section of blood vessel X.

(4)

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(iii) Describe how the heart moves blood from vessel Y to vessel X.

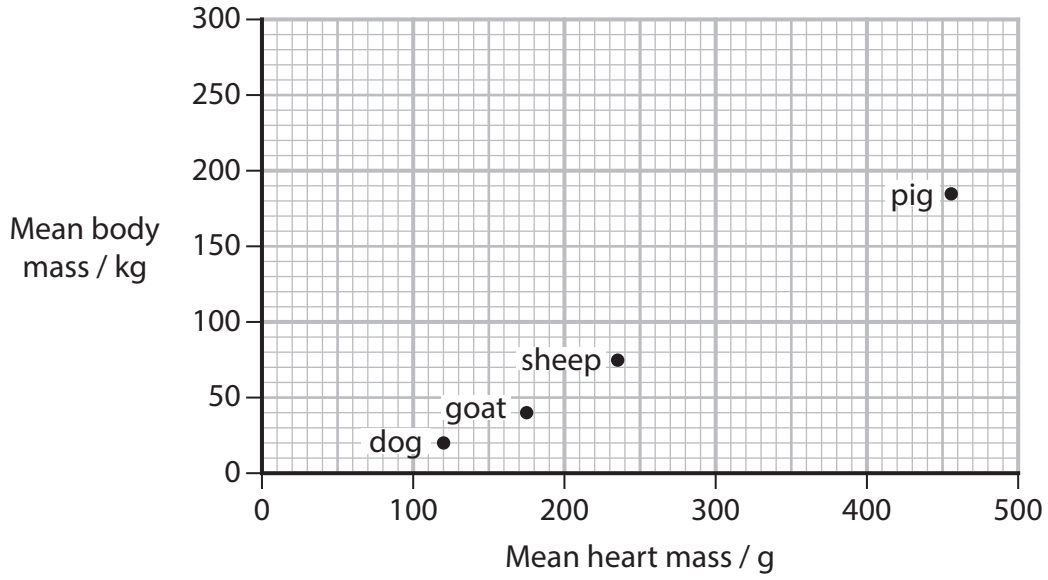
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(b) The graph shows the mean body mass and mean heart mass for four mammals.



(i) The mean body mass of a sea lion is 67 kg. The mean heart mass is 273 g.

Plot this data on the graph.

(1)

(ii) Give **one** conclusion that can be drawn from the data shown in the graph.

(1)

.....

.....

.....

(iii) Calculate the mass of the heart of the dog as a percentage of its body mass.

(2)

..... %

(Total for Question 4 = 13 marks)

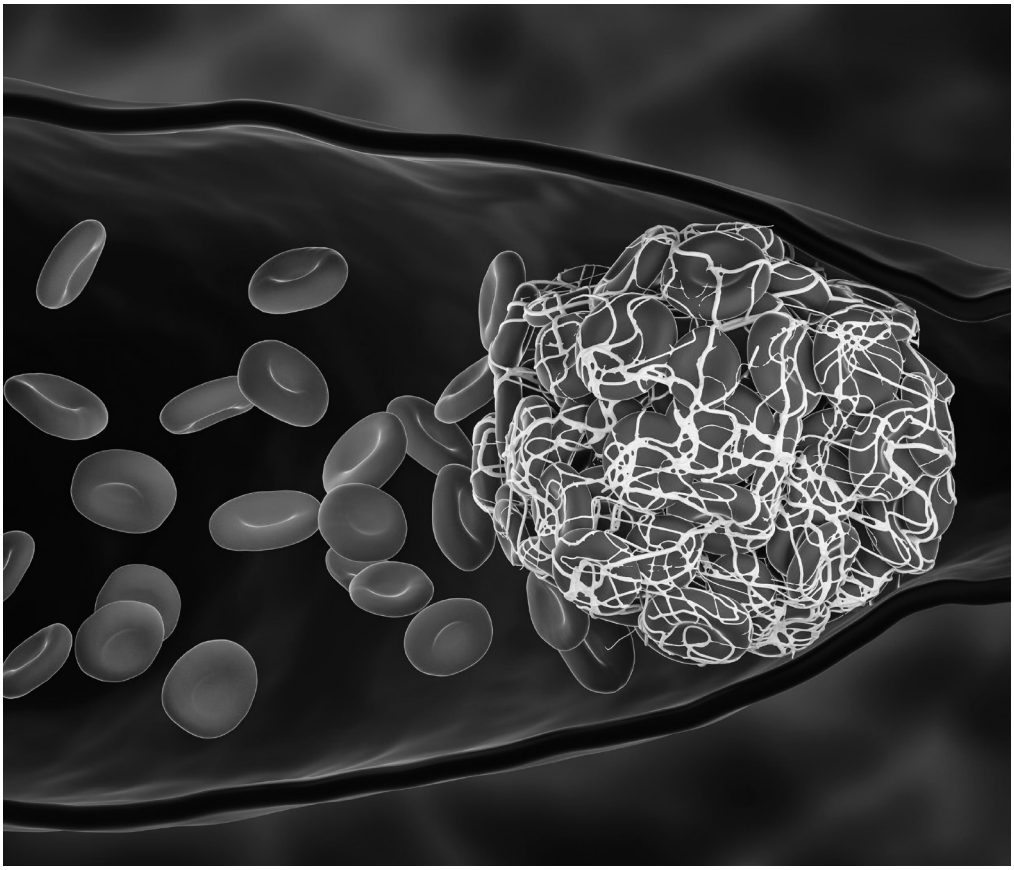
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5 Blood clots contribute to cardiovascular disease (CVD).

The image shows a blood clot blocking a blood vessel.



(Source: © MattLphotography/Alamy Stock Photo)

(a) The red blood cells are trapped in a mesh of insoluble fibrin fibres.

Describe how soluble fibrinogen is converted into insoluble fibrin.

(2)

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(b) Blood clots in coronary arteries can cause a heart attack.

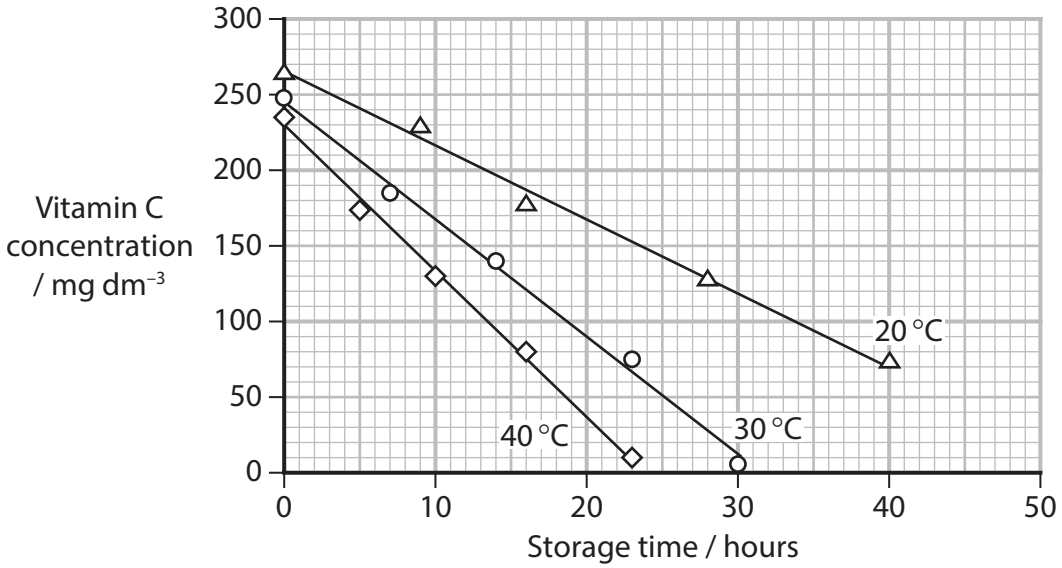
Explain the benefits and risks of using platelet inhibitors to treat people who have CVD.

(3)

(c) Vitamin C is an antioxidant and can reduce the risk of CVD.

The effect of temperature and storage time on the vitamin C concentration of grape juice was investigated.

The graph shows the results of this investigation.



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(i) Give **two** conclusions for this investigation.

(2)

1 .....

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2 .....

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(ii) Calculate the percentage **difference** in the vitamin C concentration after 20 hours of storage at 20 °C and 40 °C.

Use the equation:

$$\text{Percentage difference of two values} = \left(\frac{\text{difference between the two values}}{\text{mean of the two values}} \right) \times 100$$

Give your answer to two significant figures.

(2)

..... %

(d) It takes 6 mg of vitamin C to decolourise 1 cm^3 of DCPIP.

The volume of pineapple juice that was needed to decolourise 1 cm^3 DCPIP was 11.56 cm^3.

Calculate the mass of vitamin C in 1 cm^3 of this pineapple juice.

Give your answer in micrograms.

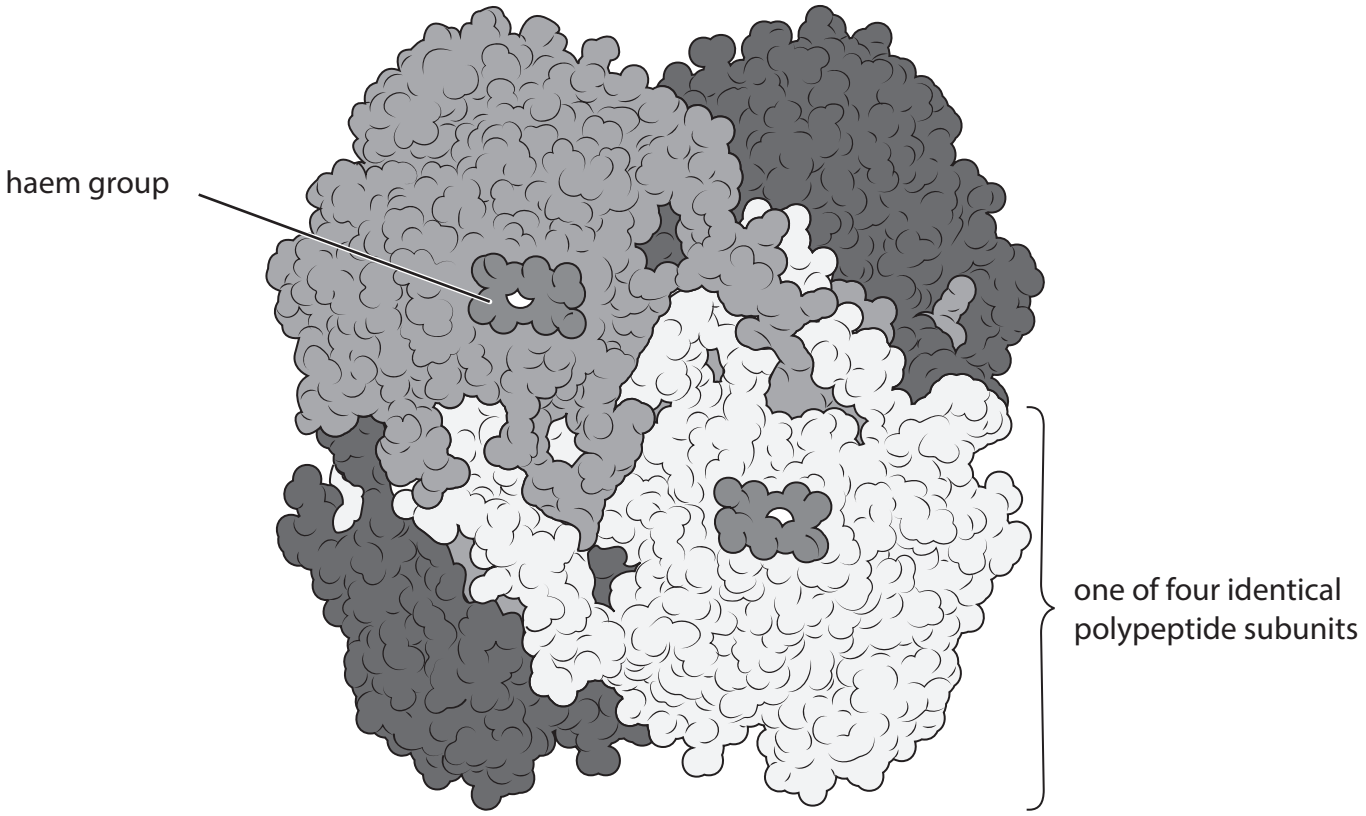
(2)

..... µg

(Total for Question 5 = 11 marks)

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6 A molecule of the enzyme catalase contains four identical polypeptide chains.
The diagram shows a catalase molecule.



(a) Compare and contrast the structure of a catalase molecule and a haemoglobin molecule.

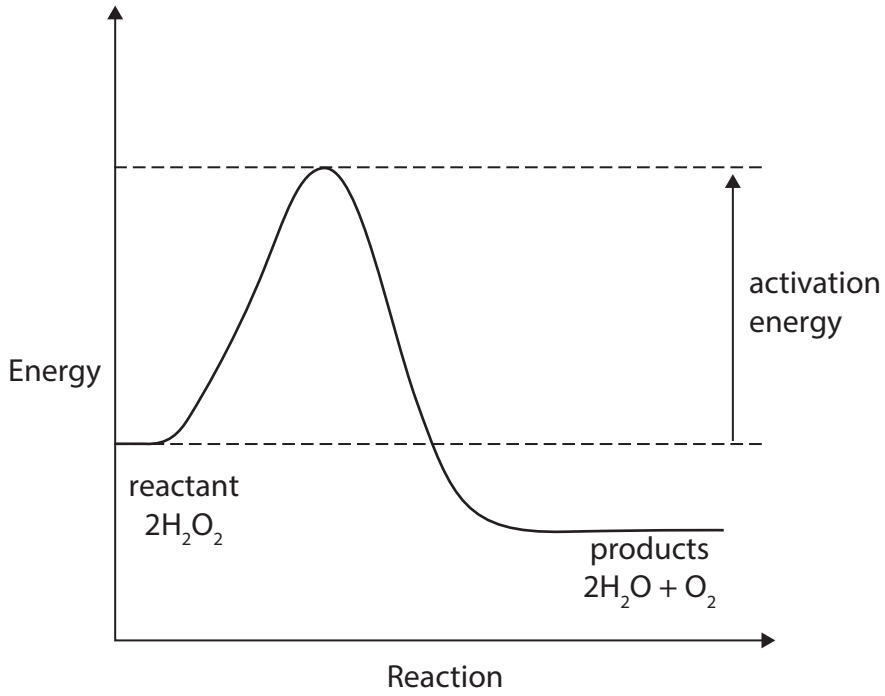
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(b) Hydrogen peroxide (H_2O_2) breaks down to form molecules of water and oxygen.

The breakdown occurs slowly when no catalase enzyme is present.

The graph shows the energy changes during this reaction.



Hydrogen peroxide breaks down faster when catalase is present.

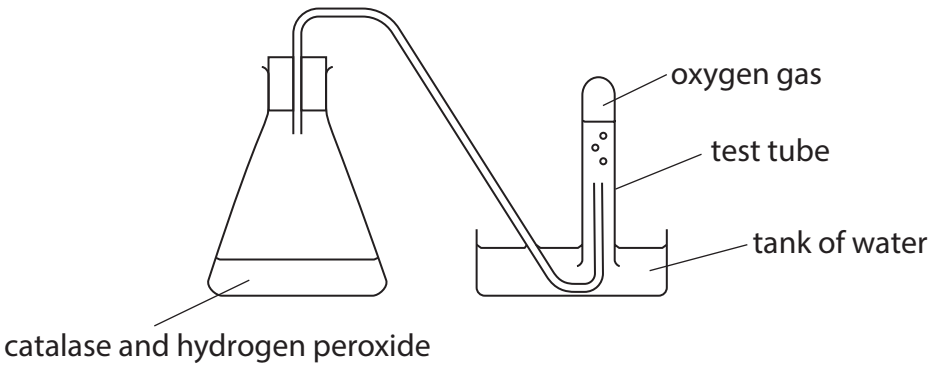
Draw a line on this graph to show what happens to the activation energy when catalase is added to hydrogen peroxide.

(1)

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(c) The activity of catalase can be measured by collecting the oxygen released.

The diagram shows one set of apparatus that could be used.



(i) State and justify a modification which would give a more accurate measure of the activity of catalase.

(1)

Modification

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Justification

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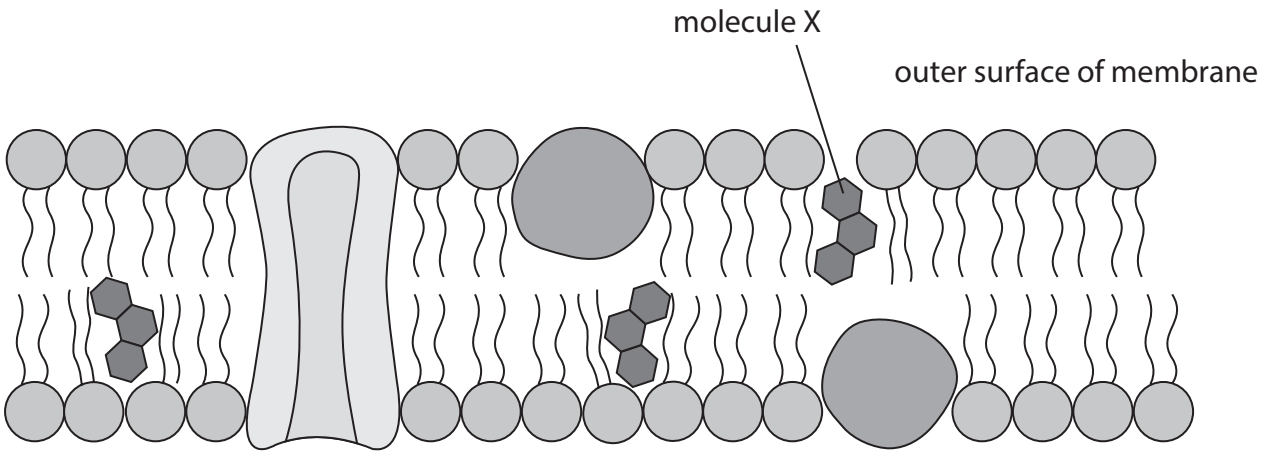
(ii) Devise an investigation to show the effect of hydrogen peroxide concentration on the **initial rate** of this reaction.

(5)

(Total for Question 6 = 10 marks)

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7 The diagram shows part of the structure of a cell membrane.



(a) (i) Draw **and** label a glycolipid **and** a glycoprotein onto this diagram.

(2)

(ii) Which of the following is molecule X?

(1)

- ☒ **A** carbohydrate
- ☒ **B** cholesterol
- ☒ **C** extrinsic protein
- ☒ **D** phospholipid

(iii) State **one** effect molecule X has on the cell membrane.

(1)

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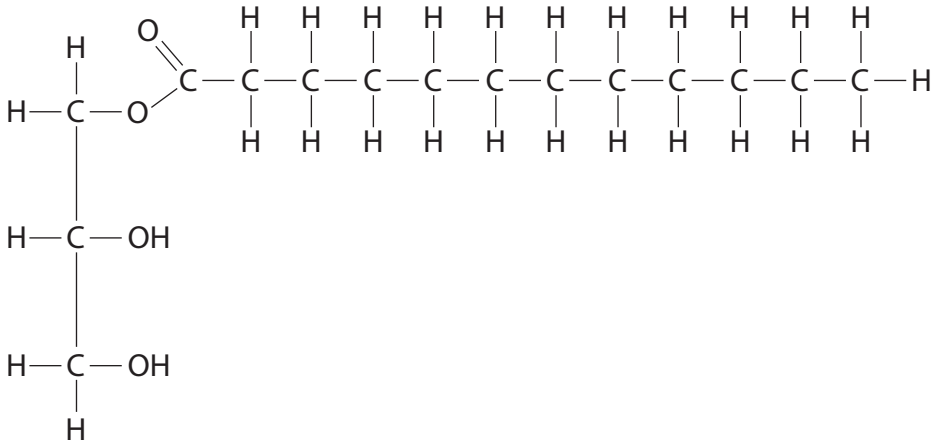
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(b) The diagram shows the structure of a monoglyceride.



(i) Compare and contrast the structure of this monoglyceride with an **unsaturated** phospholipid molecule.

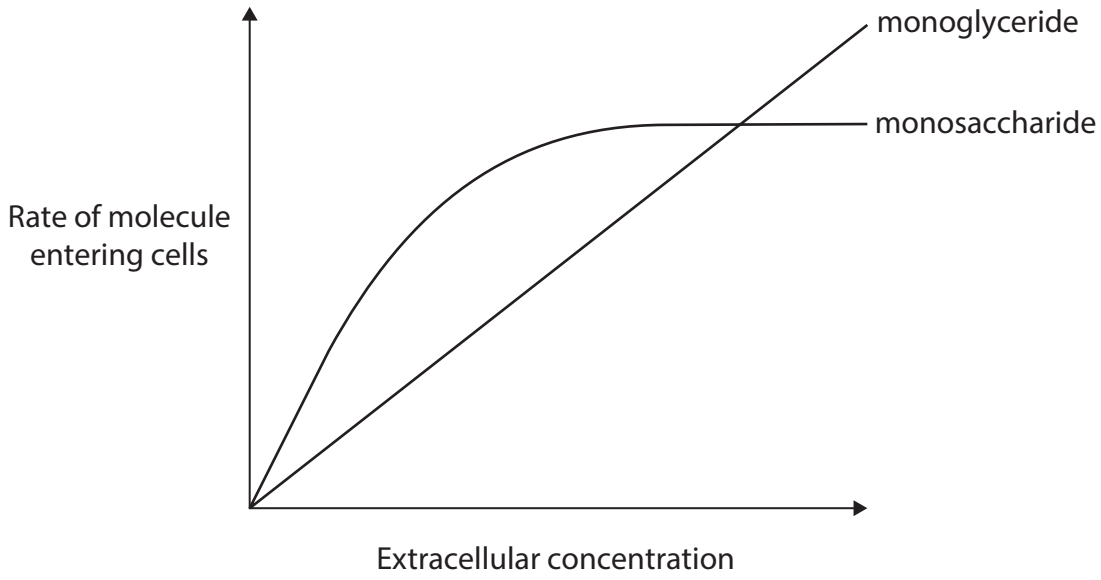
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(ii) Monosaccharides and monoglycerides can enter cells.

The effects of extracellular concentration of monoglycerides and monosaccharides on their rates of entering cells were investigated.

The graph shows the results of this investigation.



Explain the results of this investigation.

(4)

(Total for Question 7 = 12 marks)

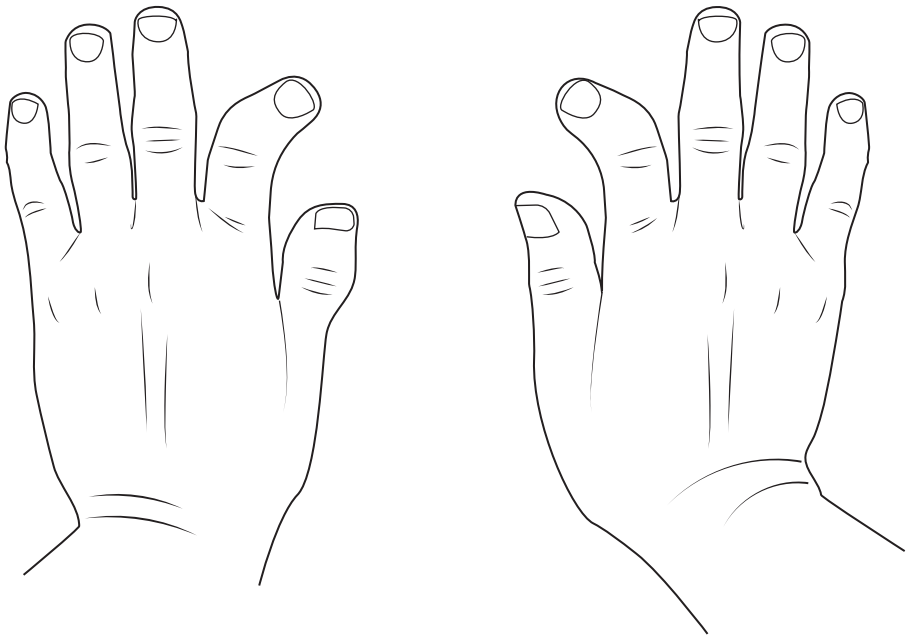
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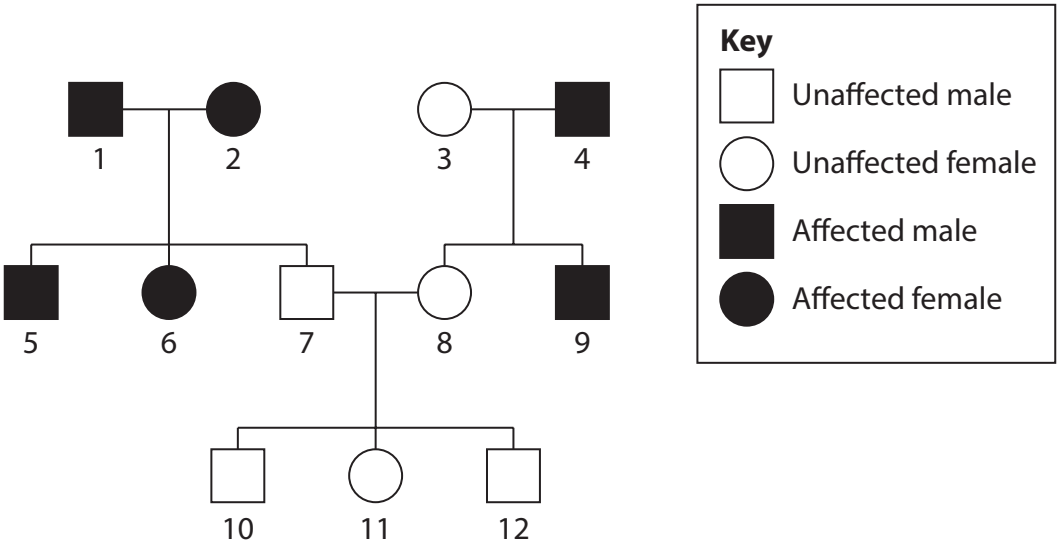
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8 (a) Brachydactyly is an inherited genetic condition that affects the development of fingers and toes.

The diagram shows the hands from a person with brachydactyly.



The diagram shows the inheritance of brachydactyly in a family.



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(i) A student concluded that individuals 1 and 2 were homozygous recessive for brachydactyly.

Evaluate this conclusion.

(3)

(ii) Individual 6 wants to have children in the future. She plans to have a test when she is pregnant to find out if the child will have a genetic condition.

Discuss the ethical issues relating to the use of a **named** genetic screening test.

(3)

Name of test:

Ethical issues:

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(b) Flower colour in snapdragon plants demonstrates incomplete dominance.

The allele C^R codes for a red pigment in flower petals.

Plants with the genotype C^WC^W have white flowers.

The photograph shows a vase containing snapdragon flowers.



(Source: © Maria Bedacht/Alamy Stock Photo)

Complete the Punnett square to show how 100% of offspring would have pink flowers, if one of the parent plants had white flowers.

(2)

(c) Cystic fibrosis is a genetic disorder that affects the functioning of the digestive system.

(i) A country had 50 000 babies born in one year.

Cystic fibrosis affected 1 in every 2500 of these babies on average.

How many babies would have been born with cystic fibrosis in this country in one year?

(1)

☒ **A** 2

☒ **B** 20

☒ **C** 200

☒ **D** 2000

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*(ii) An individual with cystic fibrosis (CF) secretes a lower concentration of pancreatic enzymes.

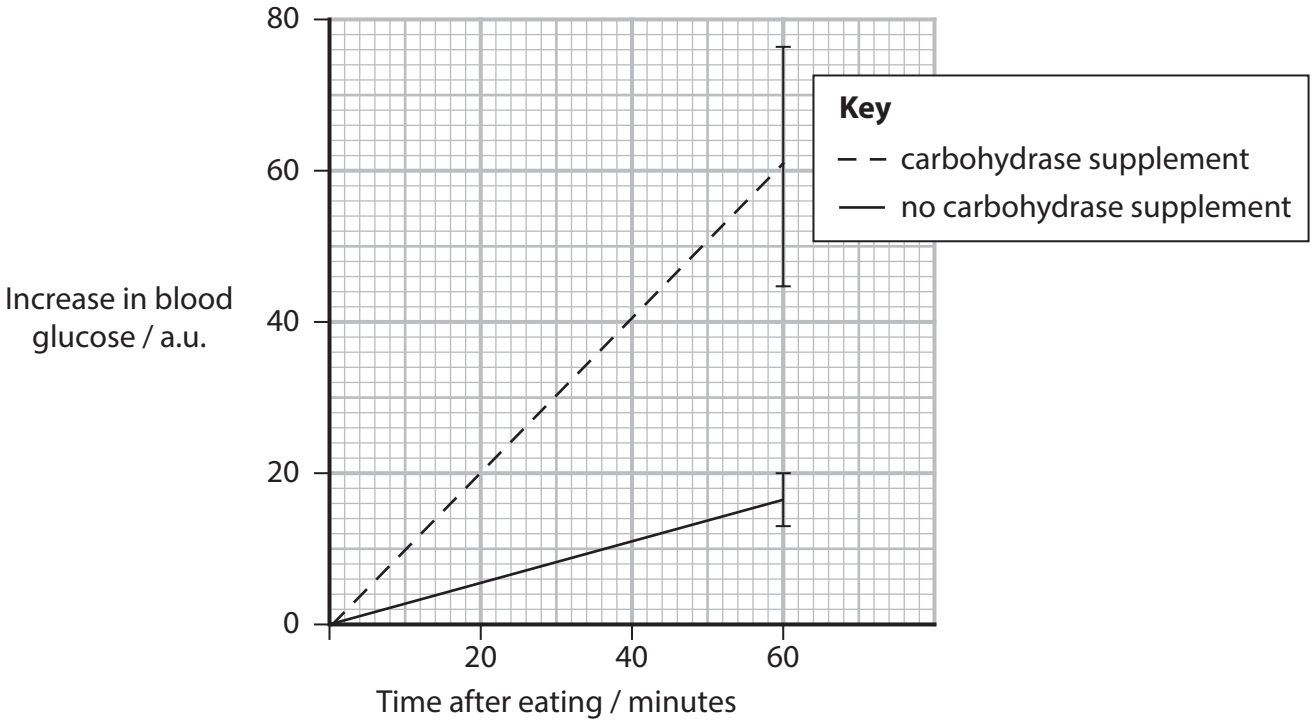
The table shows the types of enzymes secreted through the pancreatic duct into the small intestine.

Type of enzyme secreted	Molecule hydrolysed
carbohydrase	carbohydrate
lipase	lipid
protease	protein

Individuals with CF have reduced absorption of fat-soluble vitamins as well as digested molecules.

A higher proportion of the energy from food is used by the immune system in an individual with CF.

The graph shows the effect of taking supplements of carbohydrase enzyme on the increase in blood glucose after a meal.



The table shows three possible treatments for an individual with cystic fibrosis.

Treatment	Enzyme supplements	Diet
A	✓	normal balanced diet
B	✓	higher in carbohydrates, lipids and proteins
C	✗	higher in carbohydrates, lipids and proteins

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Explain which of these three treatments would be most beneficial for a young child with cystic fibrosis.

Use the information in the question to support your answer.

(6)

(Total for Question 8 = 15 marks)

TOTAL FOR PAPER = 80 MARKS

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