

Sample question paper and mark scheme

DRAFT

LEVEL 3 CAMBRIDGE ADVANCED NATIONAL (AAQ) IN

HUMAN BIOLOGY

Certificate H049

Extended Certificate H149

For first teaching in 2025

F170: Fundamentals of human biology

Introduction

This is Sample Assessment Material (SAM). It is an example exam paper that we publish alongside a new specification to help illustrate the intended style and structure of our question papers.

During the lifetime of the qualification, updates to the question paper template may happen. We always recommend you look at the most recent set of past papers where available.

We also produce two further specific resources to support you with using this SAM:

- An assessment story. We explain the research we have undertaken during the development of the qualification and how consultation with teachers, students and schools have helped shape our assessment approach.
- Annotated SAMs. We take you through the key points of the assessment and highlight the different types of questions your students will experience in the exam.

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Designed and tested with teachers and students



Helping young people develop an ethical view of the world



Equality, diversity, inclusion and belonging (EDIB) are part of everything we do

Summary of updates

Date	Version	Page number	Summary of change
July 2023	1 DRAFT	All	Creation of document

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- celebrate differences and promote positive attitudes to belonging
- include perspectives that reflect the diverse cultural and lifestyle backgrounds of our society
- challenge prejudicial views and unconscious biases
- promote a safe and supportive approach to learning
- are accessible and fair, creating positive experiences for all
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- create a shared sense of identity in a modern mixed society with one humanity.

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If you prefer to use a printed copy of the SAMs, consider printing a selection of pages. The following are the pages which you might find useful to print:

Question paper pages 5-24

Mark scheme pages 24-35



Oxford Cambridge and RSA

Level 3 Cambridge Advanced National (AAQ) in Human Biology (Certificate)

Level 3 Cambridge Advanced National (AAQ) in Human Biology (Extended Certificate)

H049/H149 F170: Fundamentals of human biology

Sample Assessment Material (SAM)

Time allowed: 1 hour 15 minutes

You must have:

- a ruler (cm/mm)

You can use:

- a scientific or graphical calculator

Please write clearly in black ink. Do not write in the barcodes.

Centre number

--	--	--	--	--	--

Candidate number

--	--	--	--	--	--

First name(s)

Last name

Date of birth

D	D	M	M	Y	Y	Y	Y
---	---	---	---	---	---	---	---

INSTRUCTIONS

- Use black ink.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.
- In the live exam there might be lined pages at the end of the question paper for you to use if you need extra space. Remember, you must clearly show the question numbers.
- Answer **all** the questions.

INFORMATION

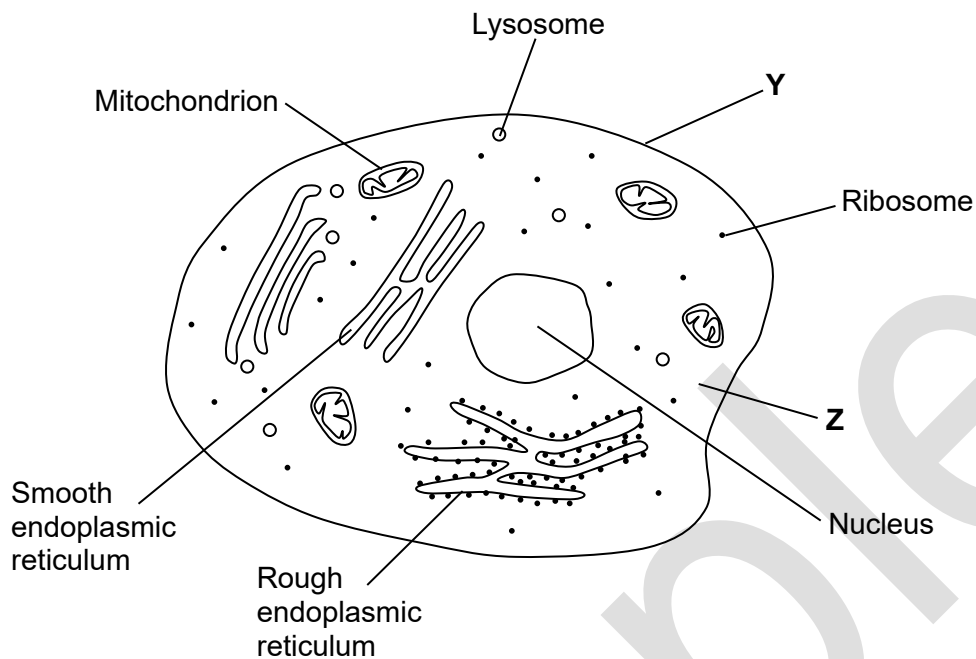
- The total mark for this paper is **60**.
- The marks for each question are shown in brackets [].
- This document consists of **20** pages.

ADVICE

- Read each question carefully before you start your answer.

Answer **all** the questions.

- 1 The diagram below shows a generalised model of a human cell. The diagram is **not** drawn to scale and two of the labels are incomplete.



- (a) (i) Identify **Y** and **Z** from the diagram.

Y

Z

[2]

- (ii) State **two** functions of the smooth endoplasmic reticulum.

1

2

[2]

- (iii) Ribosomes are found freely throughout the human cell and are attached to the rough endoplasmic reticulum.

The diagram does **not** show the other location of ribosomes.

Which structure is also known to contain ribosomes?

Tick (✓) **one** box.

- | | |
|------------------------------|--------------------------|
| Lysosome | <input type="checkbox"/> |
| Mitochondrion | <input type="checkbox"/> |
| Nucleus | <input type="checkbox"/> |
| Smooth endoplasmic reticulum | <input type="checkbox"/> |

[1]

- (b) Many cells are highly specialised. These cells often originate from stem cells found in different locations in the adult human body. One location is in bone marrow.

- (i) State **one other** location for stem cells in the human body.

..... [1]

- (ii) State **two** reasons why stem cells are used to produce new red blood cells in a laboratory.

1

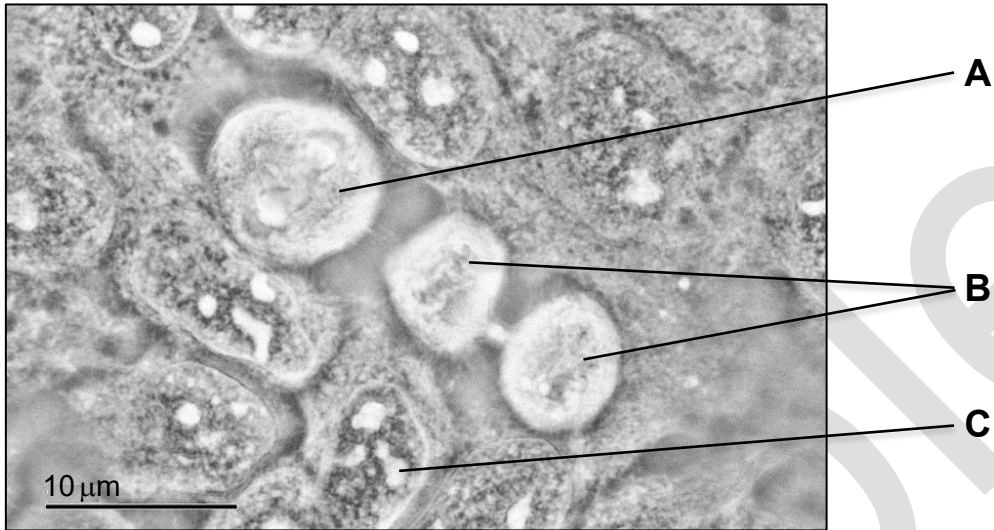
2 [2]

2 Human cancer cells divide rapidly by mitosis.

Cancer cells undergoing mitosis can be observed in a tissue sample using a light microscope.

The percentage of cancer cells dividing can be calculated over time to indicate the stage of cancer development.

The photomicrograph shows some cells undergoing mitosis within cancerous tissue.



(a) (i) Using the photomicrograph, identify **one** advantage and **one** disadvantage of using a light microscope for this observation.

Advantage

.....

Disadvantage

.....

[2]

(ii) The photomicrograph displays a bar line to represent 10 μm .

Calculate the magnification of the image using this information.

Magnification = \times **[2]**

(b) Identify the stages of mitosis shown at **A** and **B** in the photomicrograph.

Explain **one** reason for each choice.

Stage of mitosis at **A**.....

Explanation

.....

Stage of mitosis at **B**

Explanation

.....

[4]

Sample

3 An athlete has broken the radius bone in their arm.

Surgery will be required to hold the two parts of the bone together.

(a) (i) The bone will reform as different components migrate across the adjacent surfaces between the two parts.

Which **two** components must migrate across the adjacent surfaces?

Tick (✓) **two** boxes.

Erythrocytes

Fibrocytes

Hepatocytes

Muscle cells

Osteocytes

[2]

(ii) Blood vessels grow between the two parts of the damaged radius bone to deliver essential molecules and ions needed to form new bone tissue.

Complete the sentences.

The blood supply delivers oxygen needed to carry out aerobic respiration.

The reforming bone tissue also needs ions to form the matrix.

Bone growth is energy demanding. The blood supply delivers molecules as an energy source.

[2]

(iii) The athlete is keen to return to training as soon as possible.

Strength and movement are functions of bones in the human body. The consultant tells the athlete that it may take many months before the strength and movement provided by the radius bone will return to normal function.

State **one other** function of bones in the human body.

..... **[1]**

- 4 A 6-year-old child has a hole in the septum of their heart between the two ventricles. This condition is known as a ventricular septal defect (VSD).

- (a) (i) The VSD can be diagnosed by observing a number of symptoms. Three different physiological tools can be used to aid this diagnosis.

Electrocardiogram (ECG) Spirometer Ultrasound scanner

Complete the table to match the physiological tool used to show each of the symptoms of the VSD.

Each physiological tool is only used once.

Symptom of the VSD	Physiological tool
Abnormal heartbeat
Hole in the septum between the ventricles of the heart
Rapid breathing

[2]

- (ii) State **one** benefit of using an ultrasound scanner.

..... [1]

- (iii) Identify what will happen to the child's pulmonary ventilation rate (PVR) if their breathing rate increases.

..... [1]

- (b) (i) If not treated, a VSD may lead to a higher pressure of blood delivered at the lungs. This results in a condition called pulmonary resistance.

Pulmonary resistance can be measured using a peak flow meter.

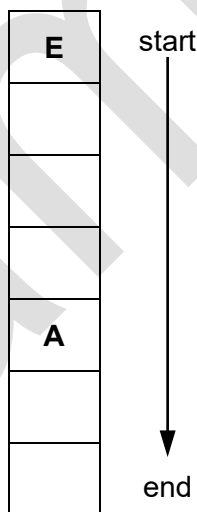
The table shows the seven steps to follow when using a peak flow meter.

The steps are not in the correct order.

Step	Action
A	Blow out as hard as you can in a single blow
B	Stand up straight
C	Take a deep breath to fill your lungs
D	Write down the number you get
E	Move the marker to the bottom of the numbered scale
F	Repeat the set of steps 2 more times
G	Put your lips tight around the mouthpiece

Write a letter for each step in each box to show the **correct** order.

Two steps (A and E) have been done for you.



[3]

- (ii) The steps taken in question 4(b)(i) will give three pulmonary resistance values.

Which of the three values should be written down in the patient's log chart?

..... [1]

- 5 (a) Simplified homeostasis models are often used to show how negative feedback affects the process of glucose regulation in the human body.

Complete the sentences to explain part of the principles of glucose regulation.

Use words from the list.

You can use each word once, more than once or not at all.

beta cells enzyme erythrocytes hormone impulse plasma

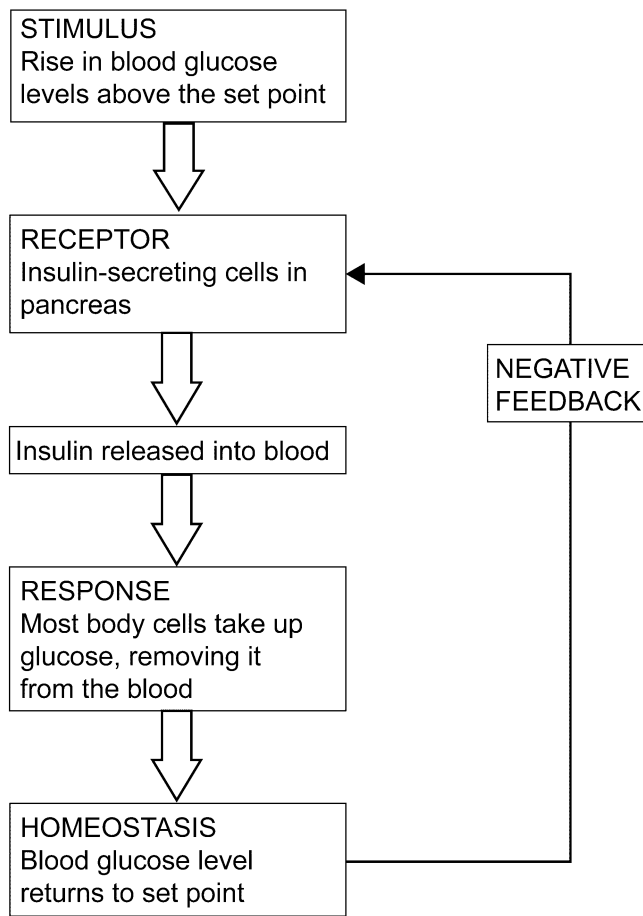
Insulin is produced by the

Insulin is a transported in blood via the

[3]

Sample

(b) The homeostasis model summarises the steps involved in the regulation of glucose.



(i) Using the model above, explain how negative feedback affects the release of insulin from the insulin-secreting cells.

.....

.....

.....

..... [2]

(ii) Outline why negative feedback is an essential part of glucose regulation.

.....

..... [1]

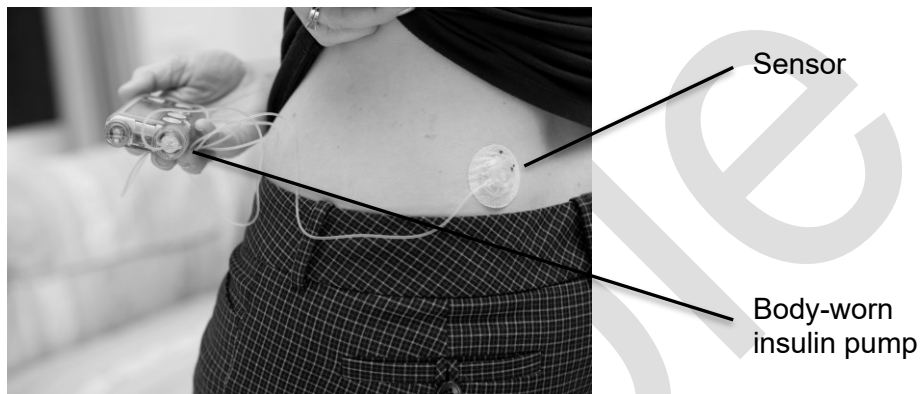
(c) (i) State **two** lifestyle changes that a patient with **type 2** diabetes could consider so that further development of their diabetes and side effects are limited.

1

2

[2]

(ii) Research has led to the production of an automated tool, commonly called the artificial pancreas, to regulate **type 1** diabetes. The tool uses a hybrid closed loop system, as shown in the image.



- A sensor is attached to the body of the patient to monitor blood glucose levels.
- The 'set point' for the patient is programmed into a body-worn insulin pump.
- The sensor transmits data to the pump.
- The data is used to calculate how much insulin is needed by the patient.
- The pump is charged by a battery cell and delivers insulin into the patient's blood.

Explain **one** advantage of using an artificial pancreas.

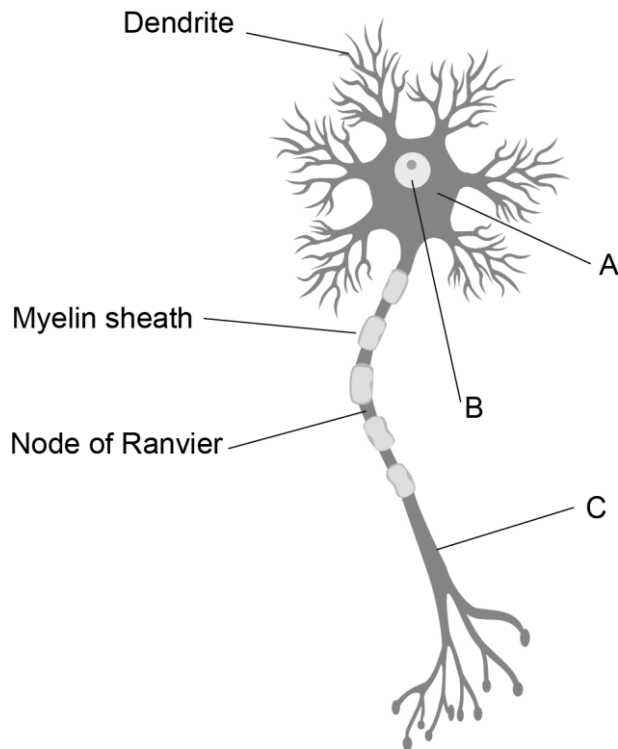
.....
.....
.....

[2]

6 A trainee doctor is studying multiple sclerosis (MS).

The trainee is already aware that this condition involves a change in the structure and function of neurons in the body.

(a) The course tutor shows the trainee a diagram of a motor neuron affected by MS.



(i) Identify structures **A**, **B** and **C** in the diagram.

A

B

C

[3]

(ii) Describe the changes to the myelin sheath causing MS.

.....

.....

..... **[2]**

(iii) State the impact of the changes to the myelin sheath on the transmission of impulses along the motor neuron.

.....

..... **[1]**

(b) The trainee is exploring the overall effect of MS on the spinal reflex arc.

State **one other** type of neuron commonly found in the spinal reflex arc, **not** including the motor neuron.

..... [1]

Sample

7 A team of research scientists are culturing bacteria extracted from the large intestine of a patient.

(a) The bacteria are cultured using the aseptic technique.

State **two** benefits of the aseptic technique when culturing bacteria.

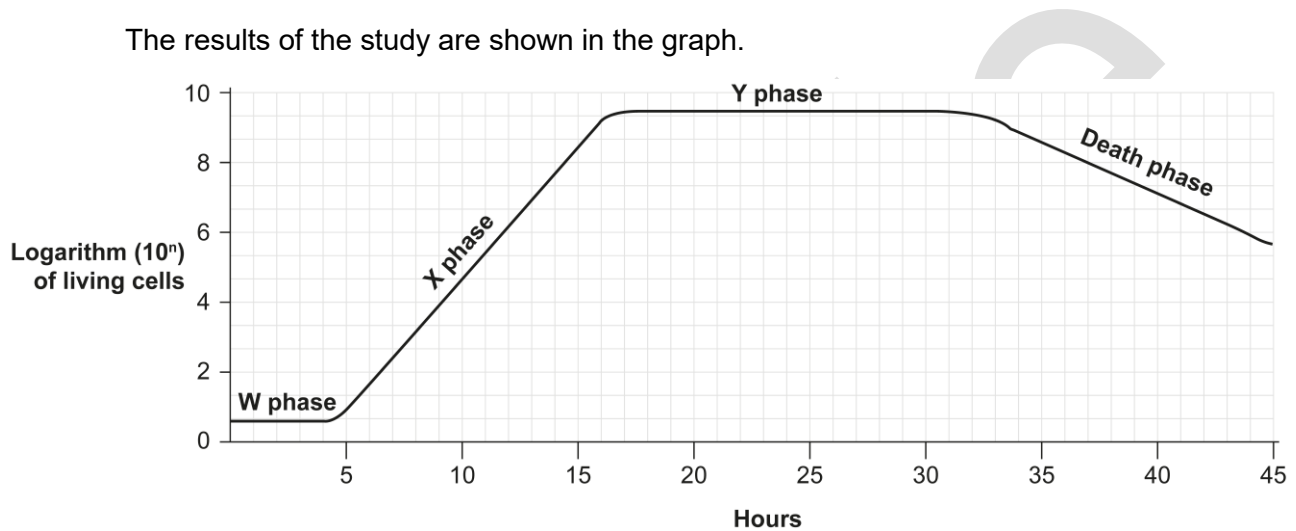
1

2

[2]

(b) A specific type of bacteria in the sample is cultured in a container of nutrient broth. Changes in the bacteria population are recorded over a period of 45 hours.

The results of the study are shown in the graph.



(i) What is the increase in logarithm (10ⁿ) of living bacterial cells recorded between phases **W** and **Y**?

Increase in logarithm (10ⁿ) of living cells = [1]

(ii) A number of factors cause the death of bacterial cells in the container during the final phase.

State **two** of these factors.

1

2

[2]

(iii) Under optimum conditions in the phase labelled **X** on the diagram, bacteria in the container reproduce rapidly by binary fission.

- It is possible to estimate how many bacteria can be produced by one bacterial cell.
- One of the bacterial cells in the container divides 18 times.

Calculate the number of bacteria produced by the original cell.

Number of bacteria produced = cells [2]

(c) The research scientists have shown that many of the bacteria found in the large intestine are beneficial to human health and wellbeing.

(i) Complete the sentences to explain how bacteria in the biome carry out their beneficial activities.

You can use each word once, more than once or not at all.

- capsule** **cell surface membrane** **chitin**
- mesosomes** **peptidoglycan** **ribosomes**

The beneficial bacteria can produce antimicrobial peptides (AMP) or proteins, which disrupt the cell walls of disease-causing bacteria.

The AMP or proteins are produced by beneficial bacterial cells at their

.....

The AMP is secreted across the by active processes.

When released into the lumen of the intestine, the AMP breaks down the

..... in the cell wall of disease-causing bacteria.

[3]

(ii) The research scientists use the latest technologies to generate products for therapeutic use, including bacterial rectal implants.

Bacterial rectal implants derived from donors must be safe to use.

State **one** factor to be considered to make sure that the implants are safe to use.

..... [1]

8 Fungi live in many different locations, including inside the human body.

A number of fungal species form branching hyphae, called a mycelium.

(a) (i) The septum in the fungal hypha contains tiny holes or perforations.

What is the function of the perforations?

..... [1]

(ii) Extracellular enzymes are secreted from the growing tips of the hyphae.

Which type of reaction is catalysed by the extracellular enzymes?

Tick (✓) **one** box.

Condensation

Hydrolysis

Oxidation

Reduction

(b) Fungi can be parasitic.

[1]

State **one** characteristic of parasitic fungi.

.....
..... [1]

END OF QUESTION PAPER

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Sample

Sample

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Level 3 Cambridge Advanced National (AAQ) in Human Biology (Certificate)

Level 3 Cambridge Advanced National (AAQ) in Human Biology (Extended Certificate)

F170: Fundamentals of human biology

SAMPLE ASSESSMENT MATERIAL

Mark scheme

This document has **12** pages.

Sample

MARKING INSTRUCTIONS

Crossed-out answers

If a student has crossed out an answer and written a clear alternative, do **not** mark the crossed-out answer.

If a student has crossed out an answer and **not** written a clear alternative, give the student the benefit of the doubt and mark the crossed-out answer if it's readable.

Multiple choice question answers

When a multiple choice question has only one correct answer and a student has written two or more answers (even if one of these answers is correct), you should **not** award a mark.

When a student writes more than one answer

1. Questions that ask for a set number (including 1) of short answers or points

If a question asks for a set number of short answers or points (e.g. **two** reasons for something), mark only the **first set number** of answers/points.

First mark the answers/points against any printed numbers on the answer lines, marking the **first** answer/point written against each printed number. **Then**, if students have not followed the printed numbers, mark the answers/points from left to right on each line and **then** line by line until the set number of answers/points have been marked. Do **not** mark the remaining answers/points.

2. Questions that ask for a single developed answer

If a student has written two or more answers to a question that only requires a single (developed) answer, and has **not** crossed out unintended answers, mark only the first answer.

3. Contradictory answers in points-based questions

When a student has written contradictory answers, do **not** award any marks, even if one of the answers is correct.

Levels of Response marking

1. To determine the level start at the highest level and work down until you reach the level that best describes the answer

2. To determine the mark within the level, consider the following:

Quality of the answer	Award mark
Consistently meets the criteria for this level	At the top of the level (6 and 9 mark questions)
Meets the criteria but with some inconsistency	At the middle of the level (9 mark questions)
On the borderline of this level and the one below	At the bottom of the level (6 and 9 mark questions)

MARK SCHEME

1 (a) (i)	
Max mark	2
Answer	Y = Cell (surface) membrane (1) Z = Cytoplasm/cytosol (1)
Guidance	1 mark for each correct answer.

1 (a) (ii)	
Max mark	2
Answer	Any two from: <ul style="list-style-type: none"> • Synthesis/storage of lipids, cholesterol, phospholipids (1) • Steroid/hormone synthesis (1) • Storage/metabolism of calcium (1) • Glycogen hydrolysis (1)
Guidance	1 mark for each correct answer. Do not accept: <ul style="list-style-type: none"> • responses referring to RER, e.g. protein synthesis

1 (a) (iii)	
Max mark	1
Answer	<ul style="list-style-type: none"> • Mitochondrion (1)
Guidance	Correct answer only.

1 (b) (i)	
Max mark	1
Answer	One mark for location of stem cell stated: <ul style="list-style-type: none"> • Lungs (1) • Liver (1) • Cartilage (1) • Muscle (1) • Skin/epidermis (1) <p>Credit any other appropriate response</p>
Guidance	1 mark for each correct answer. Do not accept: <ul style="list-style-type: none"> • Bone marrow

1 (b) (ii)	
Max mark	2
Answer	<p>Any two from:</p> <ul style="list-style-type: none"> • Unspecialised (1) • Capable of differentiating (1) • Multipotent (1) • Undergo mitosis (1) <p>Credit any other appropriate response</p>
Guidance	Correct answers only.

2 (a) (i)	
Max mark	2
Answer	<p>Up to one mark for one advantage of using a LM from the photomicrograph Up to one mark for one disadvantage of using a LM from the photomicrograph</p> <p>One mark for identifying an advantage of LM from the photomicrograph.</p> <ul style="list-style-type: none"> • Dividing cells A and B can be distinguished from non-dividing cells like cell C and surrounding cells (1) • Relative abundance of cells undergoing interphase (not mitosis) in the cells surrounding A and B is reinforced (1) <p>One mark for identifying a disadvantage of LM from the photomicrograph.</p> <ul style="list-style-type: none"> • Low magnification means that details of centromeres are not visible (1) • Presence of nuclear envelope cannot be confirmed due to the resolution/magnification of this image (1) <p>Credit any other appropriate response.</p>
Guidance	<p>Maximum one advantage and one disadvantage.</p> <p>Do not accept: LMs are cheap/quick to use</p>

2 (a) (ii)	
Max mark	2
Answer	Magnification = image size ÷ actual size $25 \text{ mm} \div 10 \mu\text{m}$ $25000 \mu\text{m} \div 10 \mu\text{m} (1)$ $= (\times) 2500 (1)$
Guidance	Look for the correct answer first . If the correct answer is present, award full marks and ignore anything else that is written in the answer space. Otherwise: 1 mark for $25000 \mu\text{m} \div 10 \mu\text{m}$

2 (b)	
Max mark	4
Answer	Up to two marks for each stage: One mark for identifying the stage of mitosis shown in the photomicrograph. One mark for explanation using the photomicrograph Stage of mitosis at A <ul style="list-style-type: none"> • Metaphase (1) Explanation <ul style="list-style-type: none"> • Clusters of chromosomes at the equator / centre of spindle arrangement (1) Stage of mitosis at B <ul style="list-style-type: none"> • Telophase (1) Explanation <ul style="list-style-type: none"> • Clusters of chromatids/new chromosomes at the opposite poles/newly forming cells (1) • Cytoplasmic streaming/cytokinesis taking place (1) Credit any other appropriate response.
Guidance	Up to two marks for each stage identified. Maximum two stages.

3 (a) (i)	
Max mark	2
Answer	<ul style="list-style-type: none"> • Fibrocytes (1) • Osteocytes (1)
Guidance	Correct answers only If a student ticks more than two boxes, award 0 marks for the whole question.

3 (a) (ii)	
Max mark	2
Answer	Calcium /Phosphate/Sodium/Magnesium (1) Glucose (1)
Guidance	1 mark for each correct answer. Accept incorrect spellings if the word is recognisable.

3 (a) (iii)	
Max mark	1
Answer	<p>One mark for function stated:</p> <ul style="list-style-type: none"> • Support (1) • Shape (1) • Protection (1) • Calcium storage (1) • Red blood cell production (1) • Hearing/ossicles (1) <p>Credit any other appropriate response.</p>
Guidance	1 mark for each correct answer. Do not allow: <ul style="list-style-type: none"> • Strength/movement

4 (a) (i)									
Max mark	2								
Answer	<table border="1"> <thead> <tr> <th>Symptom of the VSD</th> <th>Physiological tool</th> </tr> </thead> <tbody> <tr> <td>Abnormal heartbeat</td> <td>Electrocardiogram / ECG</td> </tr> <tr> <td>Hole in the septum between the ventricles of the heart</td> <td>Ultrasound scanner</td> </tr> <tr> <td>Rapid breathing</td> <td>Spirometer</td> </tr> </tbody> </table>	Symptom of the VSD	Physiological tool	Abnormal heartbeat	Electrocardiogram / ECG	Hole in the septum between the ventricles of the heart	Ultrasound scanner	Rapid breathing	Spirometer
Symptom of the VSD	Physiological tool								
Abnormal heartbeat	Electrocardiogram / ECG								
Hole in the septum between the ventricles of the heart	Ultrasound scanner								
Rapid breathing	Spirometer								
Guidance	1 mark for 1 or 2 correct answers. 2 marks for 3 correct answers. Correct answers only.								

4 (a) (ii)	
Max mark	1
Answer	<p>One mark for benefit of ultrasound scanner stated:</p> <ul style="list-style-type: none"> • Non-intrusive (1) • Real time images (1) • 3D visible (1) • No ionising radiation (1) • Painless (1) <p>Credit any other appropriate response</p>
Guidance	1 mark for a correct answer.

4 (a) (iii)	
Max mark	1
Answer	<ul style="list-style-type: none"> • PVR will increase (1) <p>Credit any other appropriate response</p>
Guidance	1 mark for a correct answer.

4 (b) (i)	
Max mark	3
Answer	<p>(E) B C G (A) D F</p>
Guidance	<p>1 mark for 1 or 2 correct answers. 2 marks for 3 or 4 correct answers. 3 marks for 5 correct answers.</p> <p>Answers must be in the correct order. Correct answers only.</p>

4 (b) (ii)	
Max mark	1
Answer	<ul style="list-style-type: none"> • Highest reading/value (1)
Guidance	Credit any other appropriate response

5 (a)	
Max mark	3
Answer	Beta cells (1) Hormone (1) Plasma (1)
Guidance	1 mark for each correct answer. Accept incorrect spellings if the word is recognisable.

5 (b) (i)	
Max mark	2
Answer	Up to two marks for valid explanation using information from the homeostasis model provided <ul style="list-style-type: none"> Negative feedback is triggered by return of glucose to set point/normal level (1) Negative feedback causes insulin-secreting/beta cells (acting as receptors) to release less insulin into the blood (1) <p>Credit any other appropriate response.</p>
Guidance	Up to two marks for valid explanation

5 (b) (ii)	
Max mark	1
Answer	<ul style="list-style-type: none"> (Essential) to avoid excess absorption of glucose (by body cells) from the blood (1) Avoid hypoglycaemia/low glucose levels in blood (1) <p>Credit any other appropriate response.</p>
Guidance	1 mark for correct answer.

5 (c) (i)	
Max mark	2
Answer	Any two from: <ul style="list-style-type: none"> Increase exercise/keep fit (1) Reduce intake of sugary foods (1) Stop smoking (1) Stop/reduce alcohol intake (1) Lose weight (1) <p>Credit any other appropriate response.</p>
Guidance	1 mark for each correct answer.

5 (c) (ii)	
Max mark	2
Answer	<p>Up to two marks for the advantage. Up to one mark for one identifying an advantage of using the artificial pancreas Up to one mark for explaining why this is an advantage</p> <ul style="list-style-type: none"> • The sensor calculates how much data is needed (1) so the patient does not need to estimate how much insulin is needed (1) • The sensor calculates how much data is needed (1) so the process is not subjective (1) • The sensor transmits the data (1) so the patient does not need to take blood samples/do finger-prick tests (1) • The body worn insulin pump delivers the insulin (1) so the patient does not need to inject insulin (1) <p>Credit any other appropriate response.</p>
Guidance	Maximum one advantage.

6 (a) (i)	
Max mark	3
Answer	<p>A Cell body/cytoplasm/soma B Nucleus C Axon</p>
Guidance	<p>1 mark for each correct answer. Accept incorrect spellings if the word is recognisable.</p>

6 (a) (ii)	
Max mark	2
Answer	<ul style="list-style-type: none"> • Myelin sheath/Schwann cell breaks down/demyelination occurs (1) • Node of Ranvier is longer/more exposed (1)
Guidance	1 mark for each correct answer.

6 (a) (iii)	
Max mark	1
Answer	<p>Any one from:</p> <ul style="list-style-type: none"> • Rate of nerve impulse transmission slows down (1) • Saltatory response stops (1) <p>Credit any other appropriate response.</p>
Guidance	1 mark for correct answer.

6 (b)	
Max mark	1
Answer	Any one from: <ul style="list-style-type: none"> • Sensory (1) • Relay/internuncial/connector (1) <p>Credit any other appropriate response.</p>
Guidance	1 mark for correct answer. Do not accept: <ul style="list-style-type: none"> • motor neuron

7 (a)	
Max mark	2
Answer	Any two from: <ul style="list-style-type: none"> • Reduces contamination of bacterial culture (1) • Reduces contamination of room/environment (1) • Provides a barrier against infection (1) • Reduces spread of disease (1) <p>Credit any other appropriate response</p>
Guidance	1 mark for each correct answer.

7 (b) (i)	
Max mark	1
Answer	<ul style="list-style-type: none"> • 8.5 (1)
Guidance	Allow tolerance of +/- 0.5

7 (b) (ii)	
Max mark	2
Answer	Any two from: <ul style="list-style-type: none"> • Toxins/poisons (1) (released by cells) • Less nutrients available (1) • Increase in temperature (1) (due to cellular respiration) • Less space available (1) • Less water available (1) • DNA damage/mutation (1) <p>Credit any other appropriate response</p>
Guidance	1 mark for each correct answer.

7 (b) (iii)	
Max mark	2
Answer	1×2^{18} (1) $= 262,144$ or 2.62×10^5 (1)
Guidance	Look for the correct answer first . If the correct answer is present, award full marks and ignore anything else that is written in the answer space. Otherwise: 1 mark for 1×2^{18}

7 (c) (i)	
Max mark	3
Answer	Ribosomes Cell surface membrane Peptidoglycan
Guidance	1 mark for each correct answer. Accept incorrect spellings if the word is recognisable.

7 (c) (ii)	
Max mark	1
Answer	Any one from: <ul style="list-style-type: none"> • Does not contain pathogens/disease-causing organisms (1) • Does not contain tissues/cells from the donor (1) • Does not contain toxins/poisons (1) Credit any other appropriate response
Guidance	1 mark for a correct answer.

8 (a) (i)	
Max mark	1
Answer	Any one from: <ul style="list-style-type: none"> • To allow movement/exchange of molecules/organelles between 'cells' (1) • To enable isolation of dead/diseased 'cells' within the hypha (1) Credit any other appropriate response
Guidance	1 mark for a correct answer

8 (a) (ii)	
Max mark	1
Answer	<ul style="list-style-type: none"> Hydrolysis (1)
Guidance	Correct answer only.

8 (b)	
Max mark	1
Answer	<p>Any one from:</p> <ul style="list-style-type: none"> Cannot survive in absence of host organism/human (1) Obtain nutrients from living cells/tissues (1) Penetrate living cells/tissues (1) <p>Credit any other appropriate response</p>
Guidance	1 mark for a correct answer

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Q5 (c) (ii), MarkHatfield, Insulin Infusion Site, www.gettyimages.co.uk

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