Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2009–2010

Science: Double Award (Modular)

Living Organisms and the Processes of Life
End of Module Test
Higher Tier

A **[GDA02]**

GDA02

WEDNESDAY 24 FEBRUARY 2010, MORNING

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all twelve** questions.

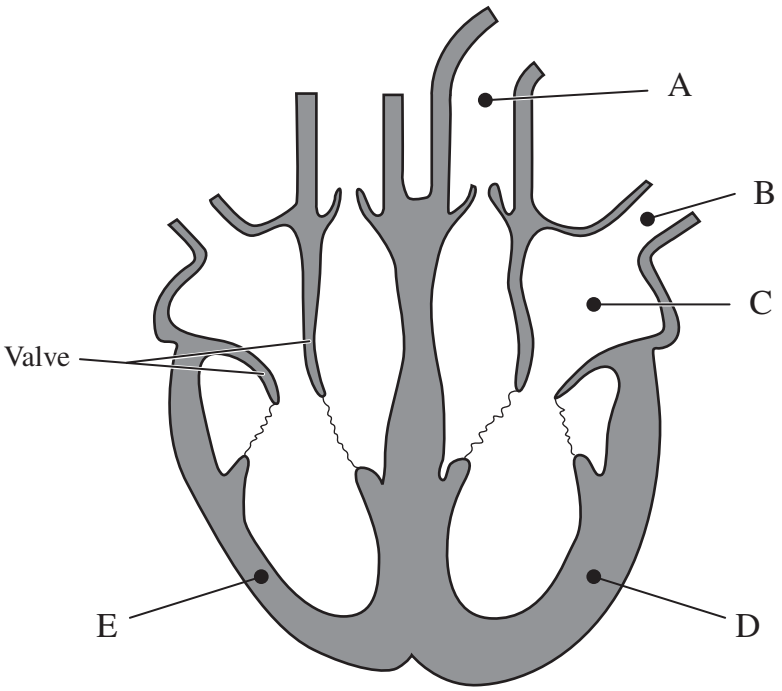
INFORMATION FOR CANDIDATES

The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total Marks	

Examiner Only	
Marks	Remark

1 The diagram shows a section through a heart.



(a) Name parts A, B and C.

A _____

B _____

C _____ [3]

(b) Shade the side of the heart that contains oxygenated blood. [1]

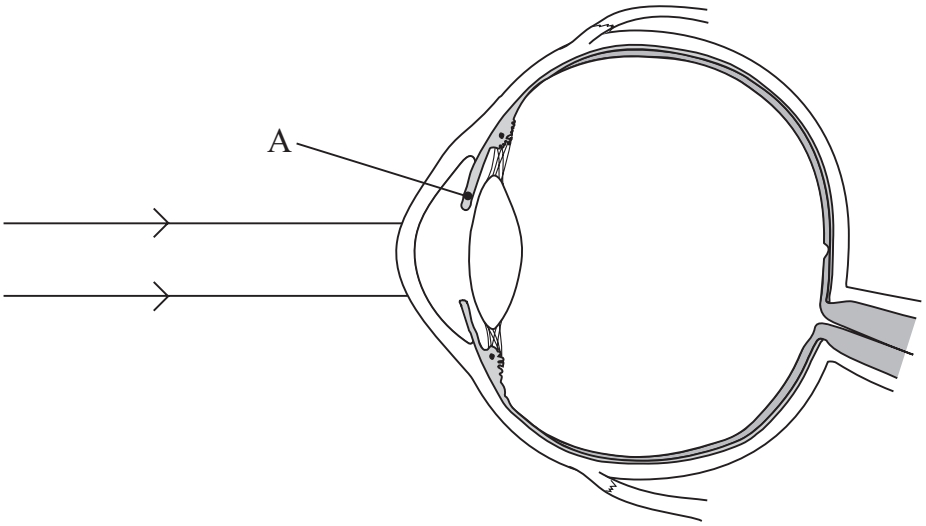
(c) Explain why muscle D in the heart is thicker than muscle E.

_____

_____ [1]

2 A section through the human eye is shown in the diagram.

Examiner Only	
Marks	Remark



(a) Name part A and state its function.

A _____

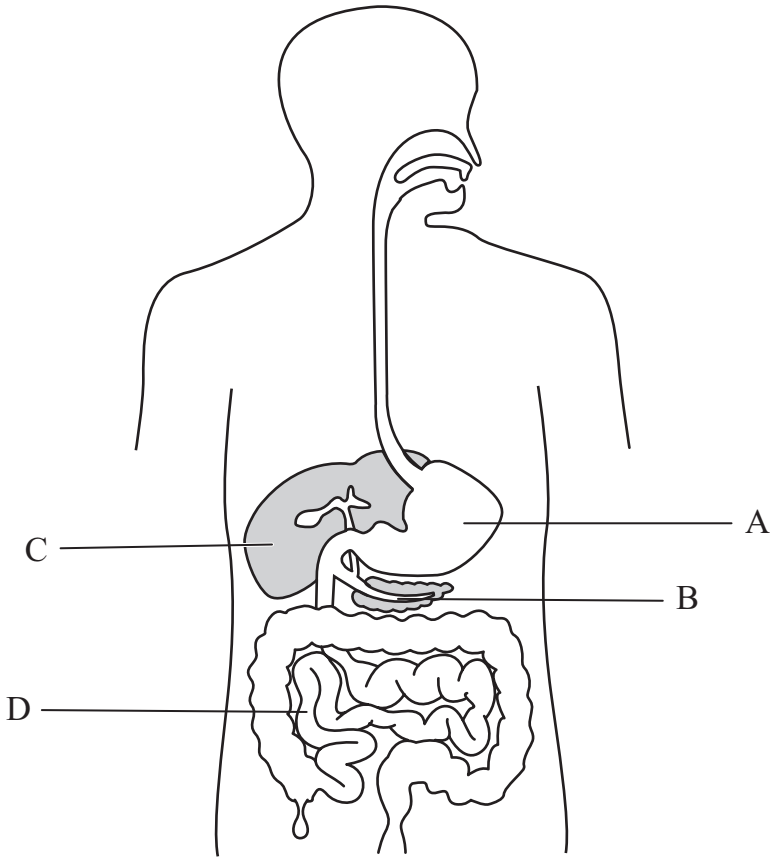
Function _____

_____ [2]

(b) Two parallel rays of light are drawn. Continue both rays to show how they are focused on the retina. [2]

3 The diagram shows the digestive system and associated organs.

Examiner Only	
Marks	Remark



(a) Explain why it is important that food is digested.

_____[1]

(b) In which of the labelled parts on the diagram (A, B, C or D) does protein digestion begin?

_____[1]

(c) Complete the table below to show the type of food broken down and the products of digestion by the enzymes named in the table.

Enzyme	**Food broken down**	**Product**
Protease		
Amylase		

[2]

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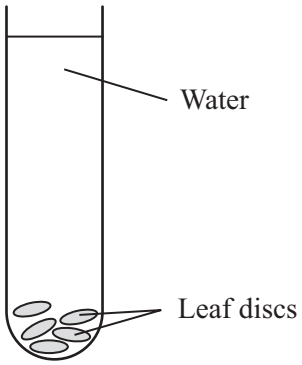
(Questions continue overleaf)

4 Jane cut five leaf discs from a geranium plant and placed them in water.



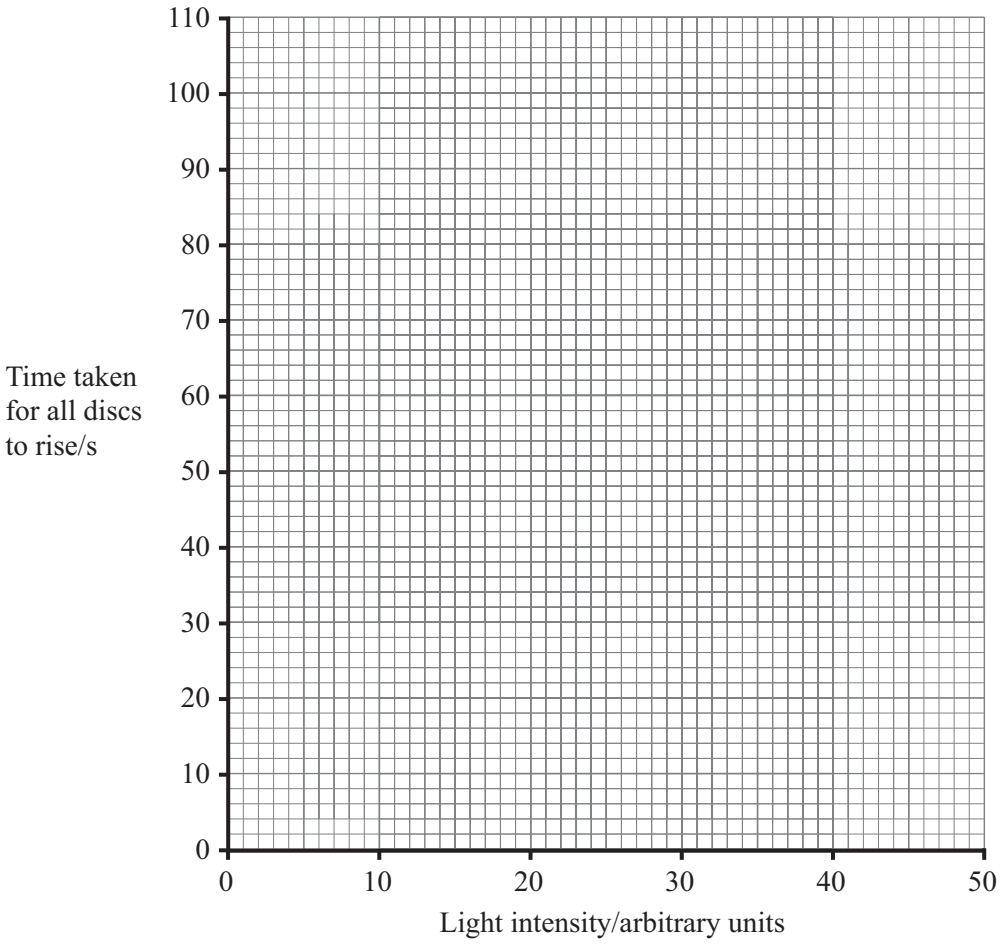
When bright light is shone on the leaf discs, bubbles of gas form on them and the leaf discs rise to the surface.
Jane carried out an experiment to investigate the effect of light intensity on the time taken for the discs to rise to the surface.
Her results are shown in the table.

Light intensity/ arbitrary units	**Time taken for all discs to rise/seconds**
10	105
20	80
30	50
40	20
50	10

Examiner Only

Marks	Remark

(a) Plot the information in the table on a line graph.



[3]

(b) Describe the trend shown by the graph and explain the results.

_____

_____

_____[3]

Examiner Only

Marks	Remark

5 Saltmarsh plants are found in salty soils in coastal regions. They have higher concentrations of salt in their root cells than is present in the surrounding sea water.

(a) Name the process involved in **water** uptake in plant roots.

_____[1]

(b) Suggest how the high concentrations of salt in their root cells help these plants.

_____

_____

_____[3]

Examiner Only	
Marks	Remark

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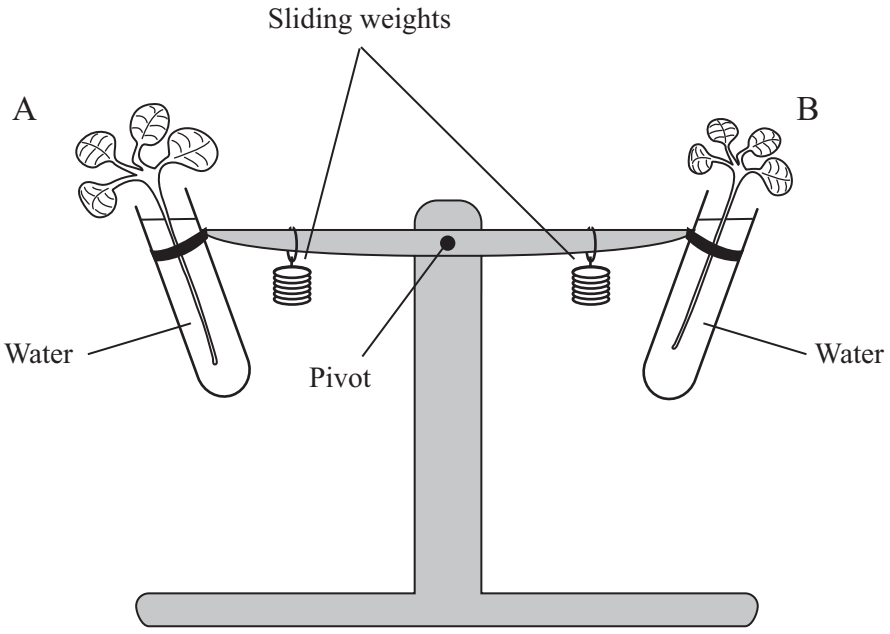
(Questions continue overleaf)

Examiner Only	
Marks	Remark

6 **(a)** A student set up this apparatus to investigate transpiration from plant shoots.

Shoot A has larger leaves than shoot B.



(i) How would the student make the sides balance at the beginning of the experiment?

_____ [1]

(ii) Describe and explain which side of the balance would be higher after 4 hours.

_____

_____

_____ [2]

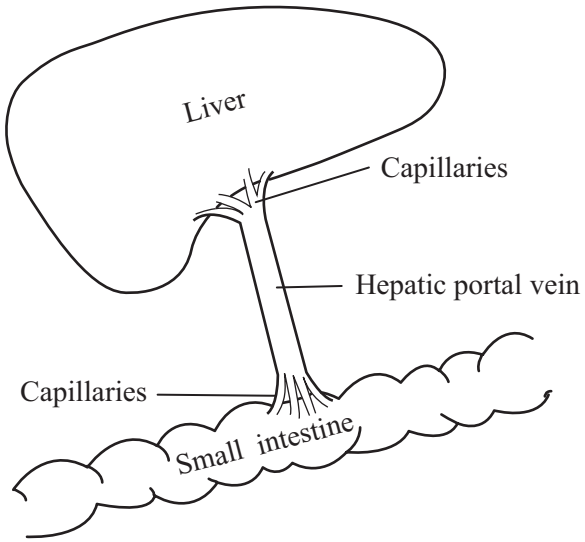
(b) In very dry weather, the stomata close and this affects gas exchange. Explain why plant growth is restricted when this happens.

_____

_____

_____ [2]

7 The diagram shows the liver and the small intestine.



(a) Use the diagram and your knowledge to suggest how the hepatic portal differs in structure from all other veins.

_____ [1]

(b) Explain the role of the liver in the assimilation of glucose.

_____

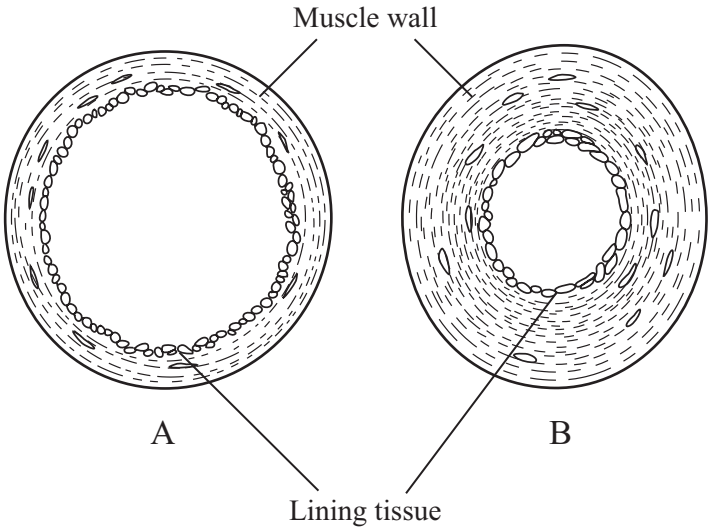
_____ [2]

Examiner Only

Marks	Remark

8 The diagrams show an artery and vein in cross section.

Examiner Only	
Marks	Remark

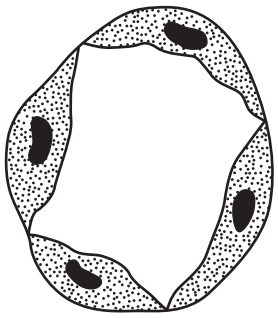


(a) Use the diagram and your knowledge to explain how you know that blood vessel A is the vein.

_____

_____ [2]

(b) The following diagram shows a capillary in cross section.



Use the diagram and your knowledge to suggest how its function is related to its structure.

_____

_____ [1]

9 Excess amino acids are broken down to urea in the liver.

Describe the pathway of the urea until it is eliminated from the body.

_____

_____

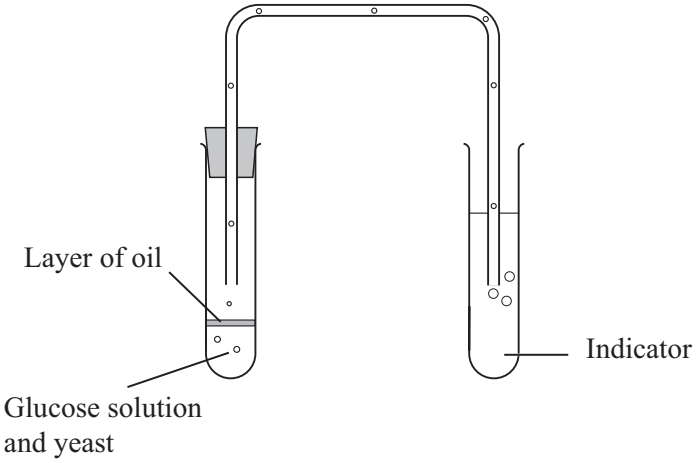
_____

_____

_____ [3]

Examiner Only	
Marks	Remark

10 The diagram shows the apparatus used to investigate anaerobic respiration in yeast.



(a) When setting up this experiment, how is the dissolved oxygen removed from the glucose solution to give anaerobic conditions?

_____ [1]

(b) Explain why a colour change in the indicator does **not** prove that the respiration is anaerobic.

_____

_____ [2]

(c) Compare the energy released during anaerobic respiration to that released during aerobic respiration.

_____ [1]

Examiner Only	
Marks	Remark

11 A crop of barley was grown under two different conditions.

Soil ploughed	Soil not ploughed
Crop yield **4 tonnes/unit area**	**Crop yield** **2.8 tonnes/unit area**

Ploughing helps aeration of the soil. Explain why the field that was ploughed before planting the crop gave a better yield than the field that was not ploughed.

_____

_____

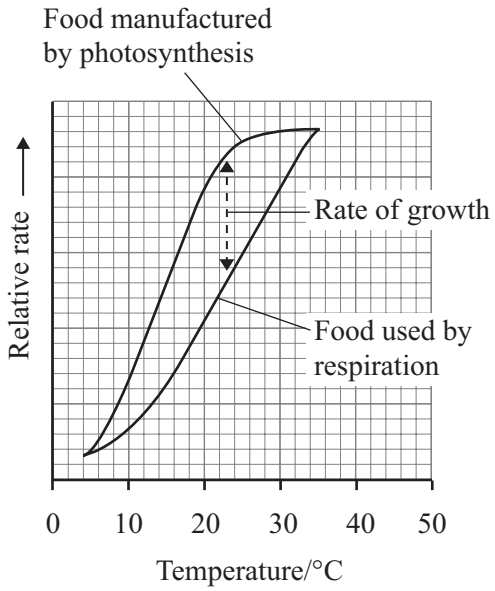
_____

_____

_____ [4]

Examiner Only	
Marks	Remark

12 The graph shows the effect of temperature on the rate of photosynthesis and respiration in a plant.



(a) Explain why the rate of both processes is low at 5 °C.

_____

_____

_____[2]

(b) Use the **graph** to suggest why it is better to grow crops at 25 °C than 15 °C.

_____

_____

_____[2]

(c) Suggest why crops often produce greater yields when growing close to the sea or a large lake.

_____

_____[1]

Examiner Only

Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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