EXAMINATIONS COUNCIL OF SWAZILAND
Swaziland General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **6884/02**

Paper 2 Core **October/November 2013**

1 hour 15 minutes

Candidates answer on the Question Paper.

No additional materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs, tables or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
Write your answers in the spaces provided on the question paper.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

This document consists of **12** printed pages.

1 Fig. 1.1 shows an arthropod.

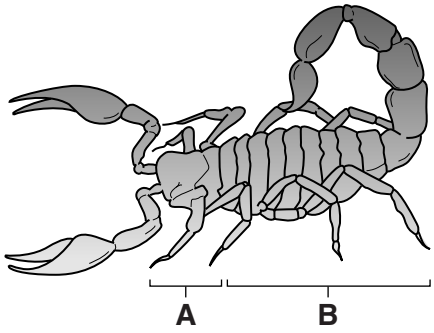

Fig. 1.1

(a) (i) Name the class to which the organism in Fig. 1.1 belongs.

.....[1]

(ii) State one characteristic feature of the organism in Fig. 1.1 that identifies it as an arthropod.

.....[1]

(b) Name the regions of the body labelled **A** and **B** in Fig. 1.1.

A .....

B .....

[2]

[Total: 4]

2 Fig. 2.1 shows the apparatus that was used to investigate osmosis in plant tissue. Two identical pieces of plant tissue were balanced on the scale as shown below. Tissue **C** was immersed in a concentrated salt solution and tissue **D** was immersed in distilled water. The apparatus was left for one hour.

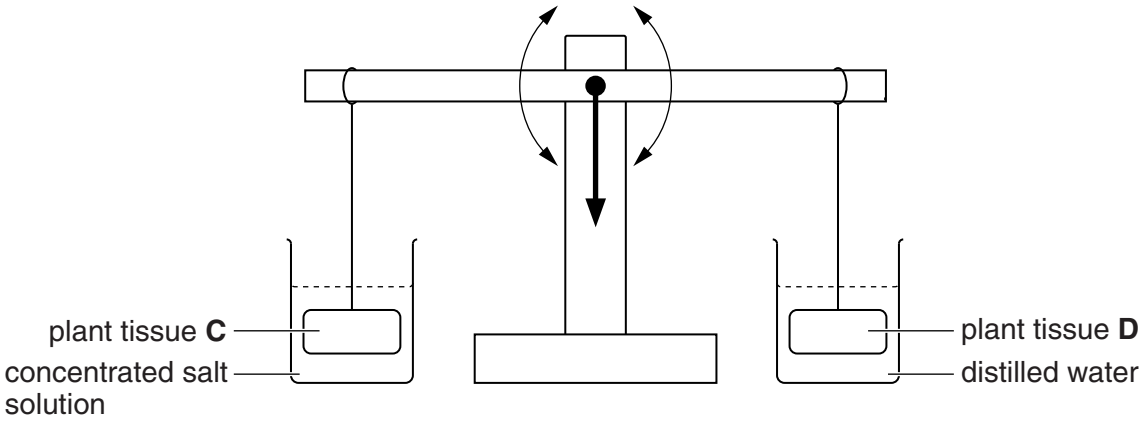

Fig. 2.1

State and explain what will happen to the scale after one hour.

.....

.....

.....

.....

.....

.....

.....[5]

[Total: 5]

3 Fig. 3.1 shows the structures involved in a reflex action, resulting in the movement of the arm in the direction shown.

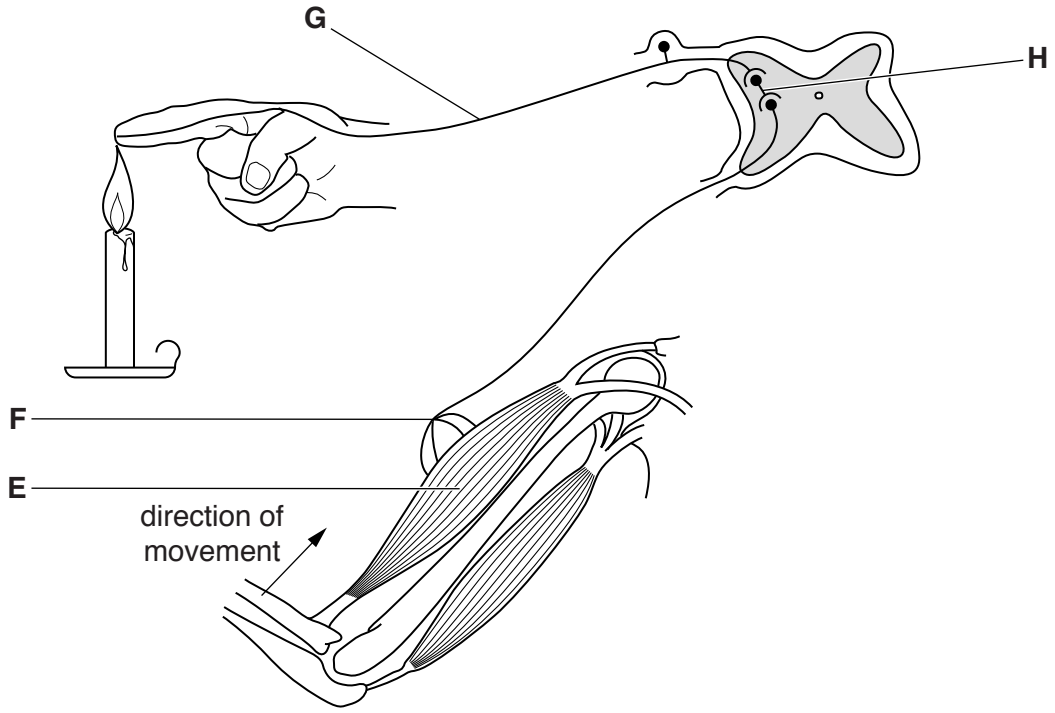

Fig. 3.1

(a) (i) Name structure **H**.

.....[1]

(ii) Using the given letters, state the sequence in which the structures **E**, **F**, **G** and **H** become involved in the movement of the arm.

..... → ..... → ..... → ..... [2]

(b) (i) Name the muscle that will contract to move the arm in the direction shown in Fig. 3.1.

.....[1]

(ii) Describe how muscles are adapted to carry out their function.

.....

.....

.....[2]

(c) The skin helps to maintain a constant body temperature.

(i) State the term used to describe the ability of the body to maintain a constant internal environment.

.....[1]

(ii) Describe the role of the skin's heat receptors and the arterioles in maintaining a constant body temperature when taking a cold bath.

heat receptors

.....

.....

.....

.....

.....[2]

arterioles

.....

.....

.....

.....

.....[3]

(d) In an emergency, the body secretes a hormone which brings about sudden and quick responses.

(i) Name the hormone that the body secretes in an emergency.

.....[1]

(ii) State and explain the effect of this hormone on the heart beat and breathing.

heart beat .....

.....

.....

.....[3]

breathing .....

.....

.....[2]

[Total: 18]

4 Fig. 4.1 shows a model of the flow of blood in the human circulatory system. The arrows show the direction of blood flow.

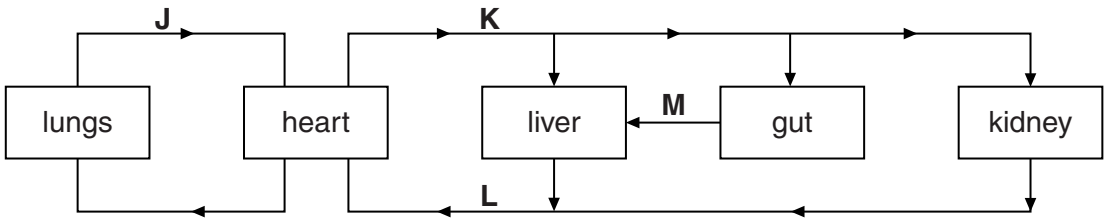

Fig. 4.1

(a) Name the blood vessels represented by letters **J** and **M**.

J .....

M .....

[2]

(b) State one difference between blood carried in vessels **K** and **L**.

.....

.....[1]

(c) **(i)** State two structural differences between an artery and a vein.

1 .....

.....

2 .....

.....

[2]

(ii) Describe what is likely to be observed in an artery of a person with a high fat diet who is at risk of suffering a heart attack.

.....

.....[1]

(iii) A person can reduce the risk of a heart attack by avoiding a high fat diet.

State two **other** preventative measures to reduce the risk of a heart attack.

1 .....

2 .....

[2]

[Total: 8]

5 **(a)** Fig. 5.1 shows the same plant at different times of the day.

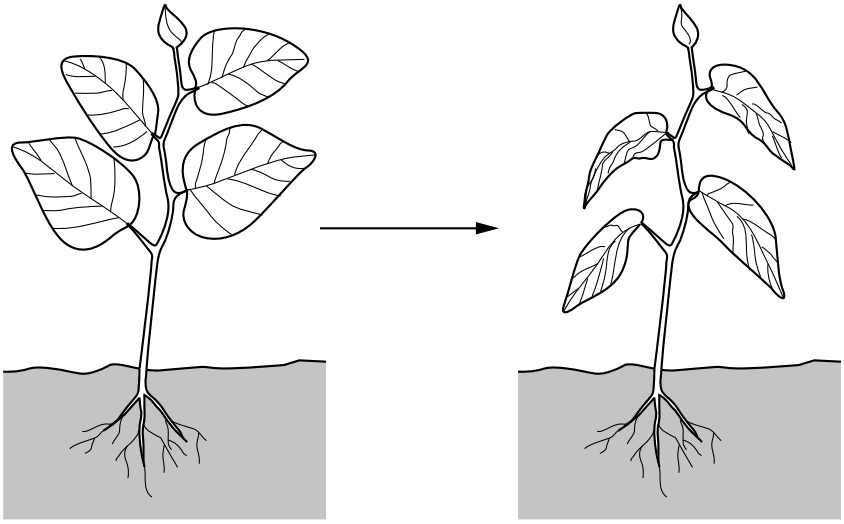

Fig. 5.1

(i) Name the condition shown by the plant at time **Q** in Fig. 5.1.

.....[1]

(ii) Describe the process that resulted in the condition shown by the plant at time **Q** in Fig. 5.1.

.....

.....

.....

.....[4]

(iii) Explain how this condition will affect the rate of photosynthesis.

.....

.....

.....[3]

(b) State why the stem of the plant at time **Q** in Fig. 5.1 is still upright while the leaves are drooping.

.....

.....

.....

.....[2]

[Total: 10]

6 At puberty, apart from an increase in growth rate, boys and girls also experience many other changes in their bodies.

(a) Define the term growth.

.....

.....[1]

(b) Name the hormone responsible for the development of secondary sexual characteristics in:

boys .....

girls .....
[2]

(c) **(i)** Name the organ that produces ova in mammals.

.....[1]

(ii) State the possible sex chromosomes that may be found in each gamete.

sperm .....

ovum .....
[2]

(d) Teenage boys and girls may have different nutritional requirements even though they may be of the same age.

Describe the difference in nutritional requirements between a body builder who wants to develop muscles and an athlete who is a long distance runner.

.....

.....

.....

.....[2]

[Total: 8]

7 In a certain plant the allele for white fruit, **R**, is dominant over the allele for yellow fruit, **r**. A white-fruited plant was crossed with a yellow-fruited plant. About half of the offspring had white fruits and the other half had yellow fruits.

(a) Define the term *allele*.

.....

.....[1]

(b) State the genotype of the white-fruited parent plant.

.....[1]

(c) White-fruited parents that were crossed produced both white-fruited offspring and yellow-fruited offspring.

Draw a genetic diagram to show the inheritance of fruit colour in this cross.

[4]

[Total: 6]

8 Fig. 8.1 shows the effect of pH on the activity of an enzyme.

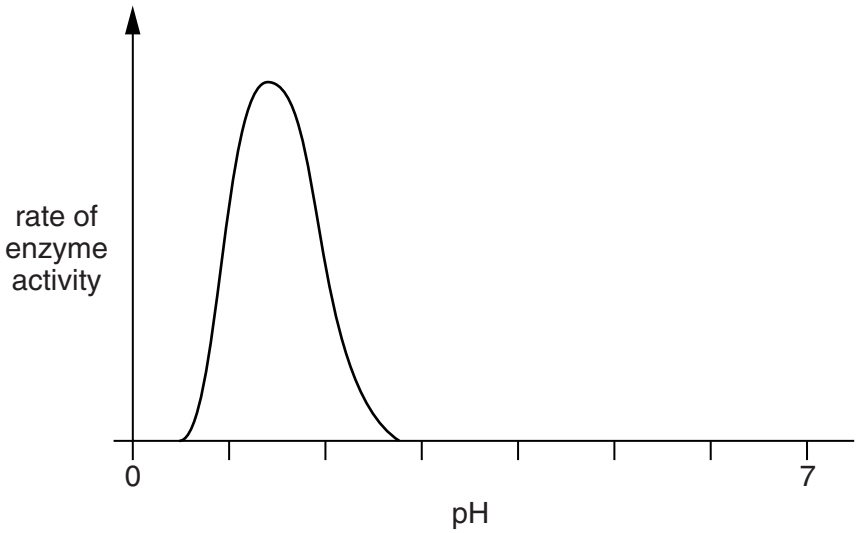

Fig. 8.1

(a) Define an enzyme.

.....

.....[2]

(b) **(i)** State the optimum pH for the enzyme in Fig. 8.1.

.....[1]

(ii) Name a region of the human alimentary canal where the enzyme in Fig. 8.1 would work best.

.....[1]

(c) State another factor that would affect the rate of enzyme activity, **other** than pH.

.....[1]

(d) Enzymes are important in the digestion of food.

Outline the process of fat digestion in the human alimentary canal up to absorption.

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.....[6]

[Total: 11]

9 Fig. 9.1 shows a food web in an ecosystem.

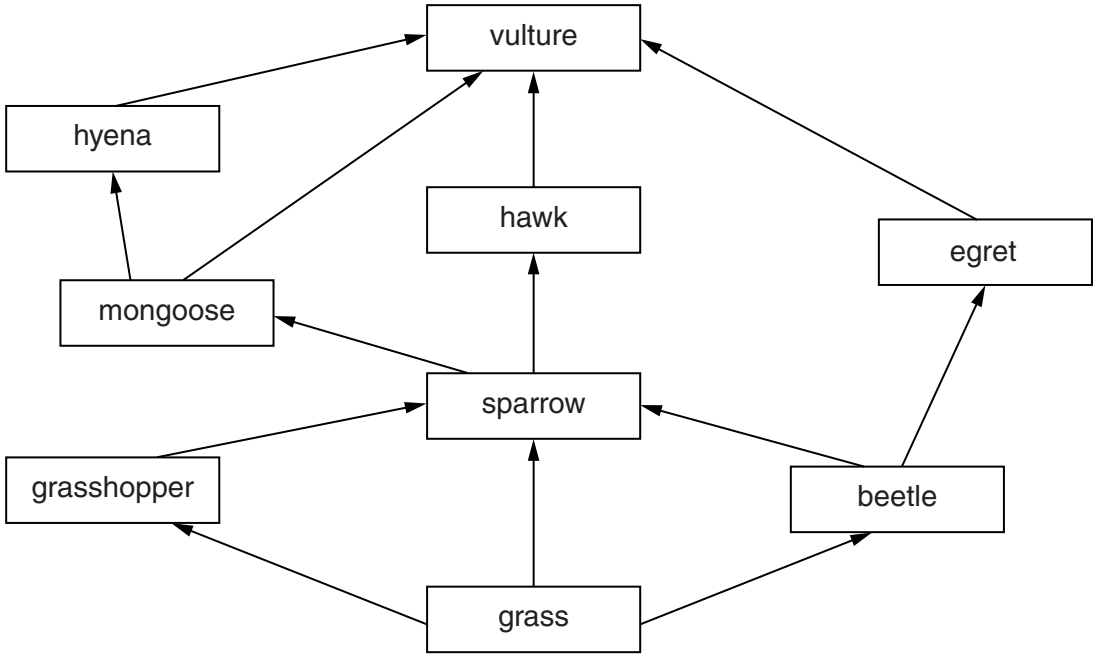

Fig. 9.1

(a) (i) Using the information given in Fig. 9.1, construct a food chain with six trophic levels.

[1]

(ii) Name the principal source of energy in an ecosystem.

.....[1]

(iii) Explain why it may be better for the sparrows in Fig. 9.1 to feed on grass instead of beetles, in terms of energy value.

.....

.....[2]

(iv) Describe the effect of an increase in the population of hawks on grasshoppers.

.....

.....

.....

.....[2]

(b) Describe the effect on vultures of using pesticides to kill insects such as grasshoppers and beetles.

.....

.....

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.....[4]

[Total: 10]