Centre Number	Candidate Number

Candidate Name_____

EXAMINATIONS COUNCIL OF ZAMBIA
Joint Examination for the School Certificate and General Certificate of Education Ordinary Level

BIOLOGY 5090/2

PAPER 2 Theory

Monday **8 NOVEMBER 2010** **1 hour 45 minutes**

Additional materials:
Answer Booklet

TIME: 1 hour 45 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page and on the Answer Booklet used.

There are **ten** questions in this paper.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer any **three** questions.

Write your answers in the Answer Booklet provided.

At the end of the examination:

1. fasten the Answer Booklet used securely to the question paper,
2. **enter** the numbers of the Section B questions you have answered in the grid on the right.

FOR EXAMINER'S USE	
Section A	
Section B	
Total	

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.

You are advised to spend no longer than one hour on Section A and no longer than 45 minutes on Section B.

Cell phones are not allowed in the examination room.

Section A [44 marks]

Answer all questions

1 **Figure 1.1** shows the structures of four specialised cells.

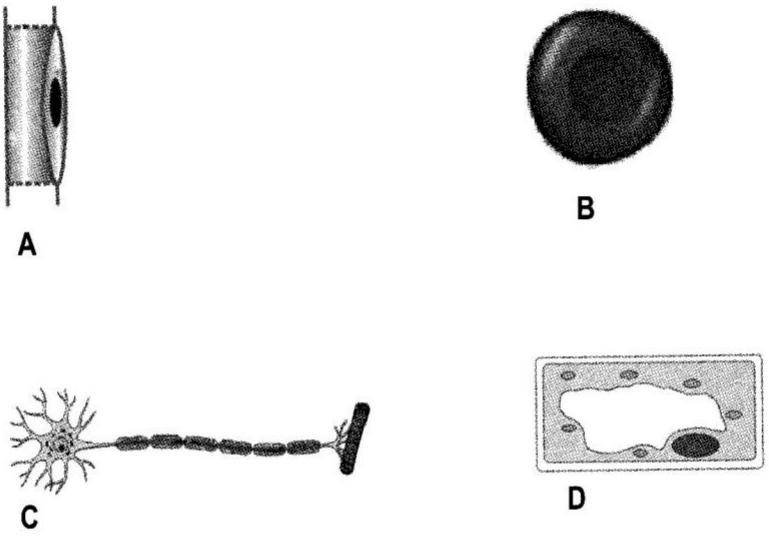

Figure 1.1

(a) **(i)** Using the letters of the cells, identify animal cells and name them.

	Identity	Name
1.		
2.		

[2]

(ii) For each named animal cell in (a) (i), state one of its characteristic features.

Feature in Animal cell 1: .....

.....

Feature in Animal cell 2: .....

..... [2]

For Examiner's Use

(b) For cells A and D in figure 1.1, name the substance found in the cell which enables it to perform its specialised function.

Cell	Substance	Function
A		
D		

[2]

(c) **Figure 1.2** shows an experiment on osmosis.

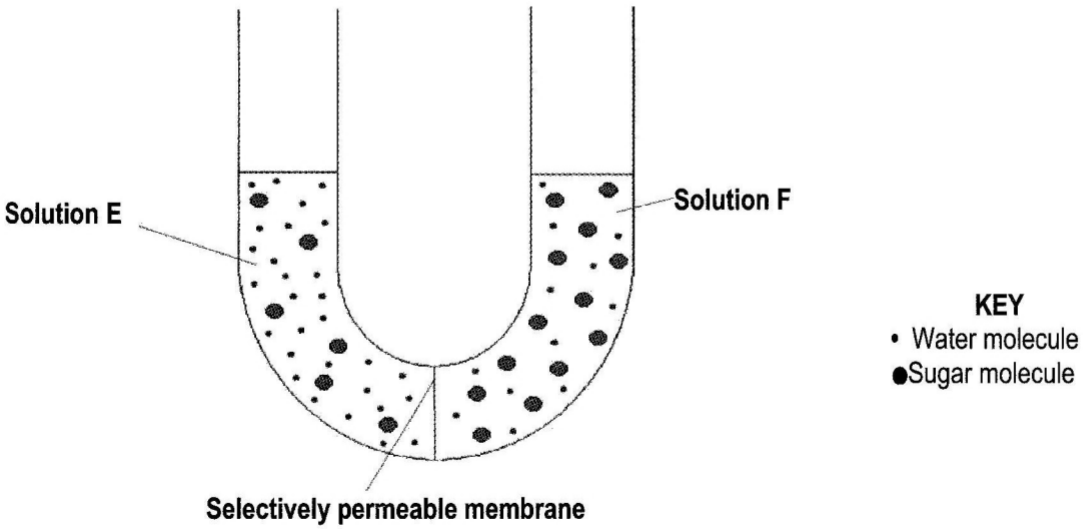

Figure 1.2

(i) From which solution in figure 1.2 will there be flow of water molecules by osmosis?

..... [1]

(ii) When will the flow of water molecules across the membrane stop by osmosis?

.....

..... [1]

(iii) Suggest one reason why only water molecules can move across this membrane.

.....

..... [1]

[Total 9]

2 **Figure 2.1** shows the human digestive system.

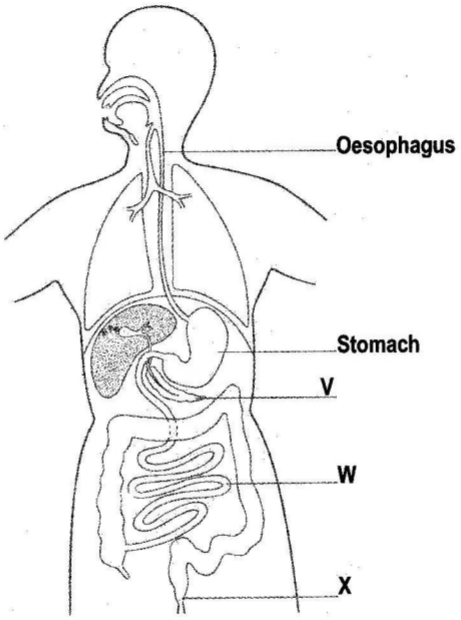

Figure 2.1

(a) From **Figure 2.1**, select the letter where

(i) egestion occurs.....

(ii) pancreatic juice is formed.....

(iii) villi are present..... [3]

(b) The stomach produces hydrochloric acid.

State **two** functions of this acid in the stomach.

1. .....

.....

2. .....

..... [2]

(c) Describe the roles of the liver in

(i) digestion.....

.....

(ii) assimilation .....

.....

..... [4]

[Total 9]

Figure 3.1 shows a longitudinal section through a bean seed.

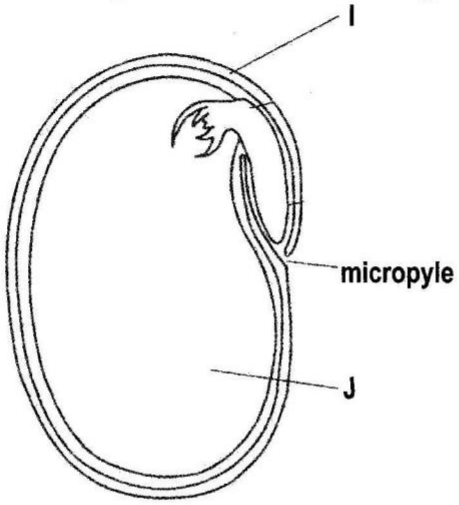

Figure 3.1

(a) Identify the parts labelled **I** and **J**.

I. ..... [1]

J..... [1]

(b) Describe the role of the micropyle and structure J.

(i) micropyle

.....

.....

..... [1]

(ii) structure J

.....

.....

..... [1]

(c) **Figure 3.2** shows the position of the plumule after exposure of a seedling to one-sided light for five days.

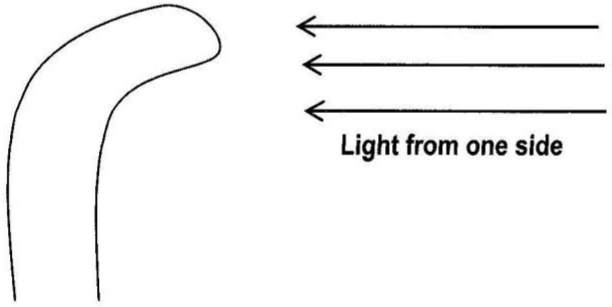

Figure 3.2

(i) Explain the effects of one sided light on the tip of the Plumule.

.....

.....

..... [2]

(ii) What is the benefit of this effect to the seedling?

.....

.....

..... [2]

[Total 8]

4 **Figure 4.1** shows some components found in an ecosystem.

Component A	Component B	Component C
1 river 70 trees 250 hectares of grass 17 rocks 50 hares 100 impalas 200 zebra 4 lions	100 impalas	50 hares 100 impalas 200 zebra 4 lions

Figure 4.1

(a) Which of the above component corresponds to

(i) a population?

.....

(ii) a community?

..... [2]

(b) **(i)** Which of the above components contains abiotic factors?

..... [1]

(ii) From the component named in **b(i),** give one example of an abiotic factor.

..... [1]

(iii) Construct a food chain using organisms in component A in figure 4.1.

..... [1]

(c) **Figure 4.2** shows untreated industrial effluent being discharged into a river.

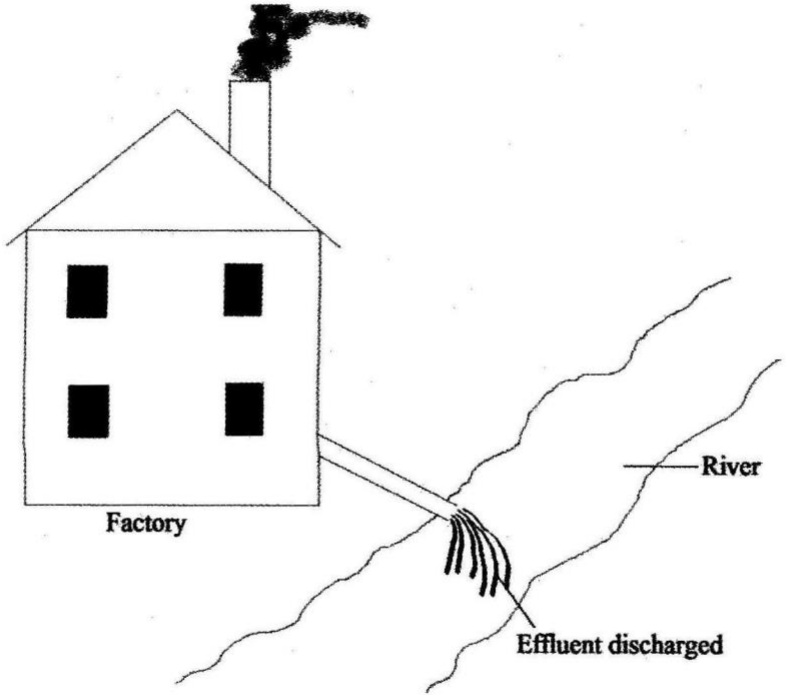

Figure 4.2

(i) What type of pollution is shown in figure 4.2?

..... [1]

(ii) Suggest a pollutant which can be found in the industrial effluent.

..... [1]

(iii) What measures can be taken to reduce this type of pollution?

.....

.....

..... [2]

[Total 9]

5 **Figure 5.1** shows the inheritance of haemophilia in a family.

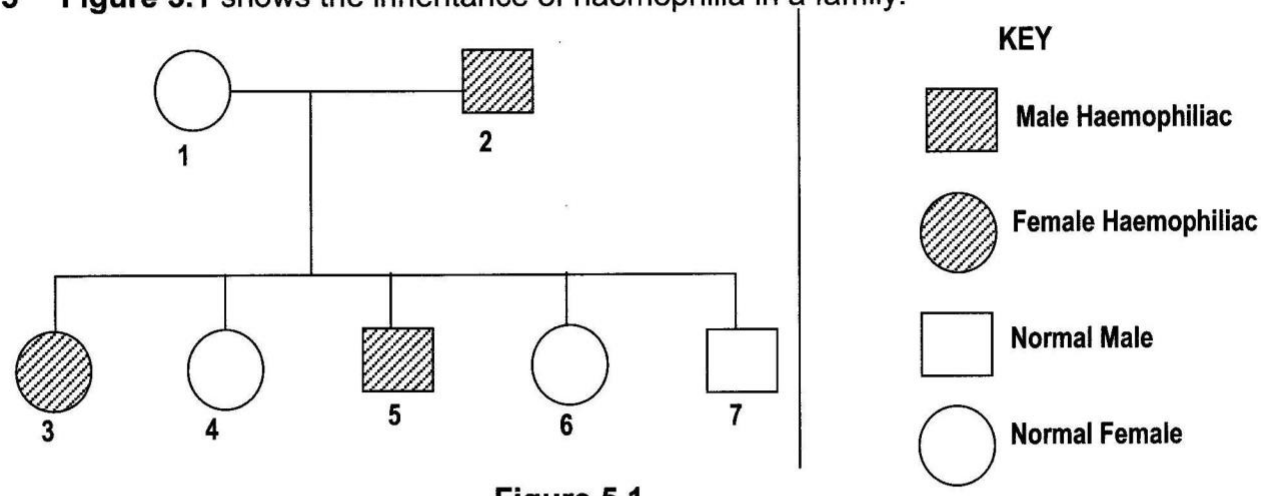

Figure 5.1

(a) Taking the allele for haemophilia to be X^h, what is the genotype of offspring 3 and 7?

Offspring 3:.....

Offspring 7:..... [2]

(b) Offspring 4 married a person with similar genotype to offspring 7.

(i) Draw a genetic diagram to show the genotypes and the phenotypes of the offspring.

[5]

(ii) What is the probability of them having a normal child?

..... [1]

(iii) What is the probability of them having a child who is a carrier?

..... [1]

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[Total 9]

Section B [36 marks]

Answer any **three** questions.
All answers should be written as full sentences in paragraphs and **not in point form**.

(a) Compare and contrast gaseous exchange in a fish and an insect. [4]

(b) Describe the composition and functions of lymph. [8]

[Total: 12]

(a) **(i)** Explain the factors which reduce immunity to pathogens. [3]

(ii) Explain why immunisation against diseases such as measles and tuberculosis (TB) is most important in children under the age of five. [3]

(b) Describe the methods of transmission of schistomiasis (bilharzia). How can it be prevented and controlled? [6]

[Total: 12]

(a) Explain the meaning of the following terms:

(i) positive geotropism

(ii) phototropism [4]

(b) Distinguish between a tropic response and a tactic response. [4]

(c) Outline the path taken by an impulse through a spinal reflex arc. [4]

[Total: 12]

(a) Explain the following terms

(i) transpiration pull

(ii) translocation

(iii) gutation [6]

(b) Describe how a simple potometer can be set up and used to show transpiration.[6]

[Total 12]

(a) Explain the effects of the following human activities on other organisms.

(i) Fishing [3]

(ii) Charcoal burning [3]

(c) Describe the **undesirable** effects of the following types of pollution.

(i) Raw sewage in water. [3]

(ii) Sulphur dioxide in air [3]

[Total 12 marks]