

Candidate Name \_\_\_\_\_

Centre Number				Candidate Number									

**EXAMINATIONS COUNCIL OF ZAMBIA**

**Examination for General Certificate of Education Ordinary Level**

**Biology**  
**Paper 2 Theory**

**5090/2**

**Wednesday**

**6 JULY 2016**

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 bottom right side corner.

**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.

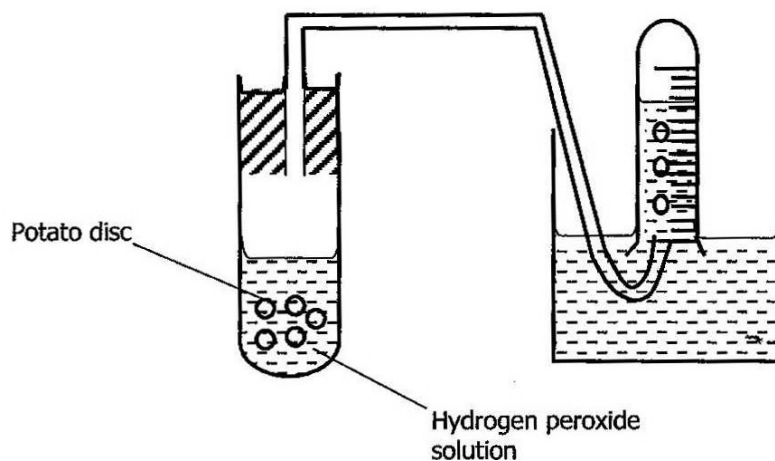
**Cell phones are not allowed in the examination room.**

FOR EXAMINER'S USE	
Section A	
Section B	
Total	

## Section A [44 marks]

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

- 1** **Figure 1.0** shows the set up to an experiment used to investigate the effect of a biological catalyst on the decomposition of hydrogen peroxide to produce oxygen.



**Figure 1.0**

Three experiments were carried out under different conditions as shown in the table below.

Experiment number	Volume of hydrogen peroxide	Number of potato discs used	Nature of potato discs used	Volume of oxygen
1	5cm <sup>3</sup>	0	-	1.5cm <sup>3</sup>
2	5cm <sup>3</sup>	5	Boiled	1.5cm <sup>3</sup>
3	5cm <sup>3</sup>	5	Raw	10.0cm <sup>3</sup>

- (a) (i)** What is the general name given to a biological catalyst?

..... [1]

- (ii)** Give a reason for boiling the potato discs in experiment 2.

..... [1]

- (iii)** Explain the difference in results obtained between experiments **1** and **3**.

..... [2]

**(b)** Predict what would be the result of:

**(i)** increasing the number of potato discs in 5cm<sup>3</sup> of hydrogen peroxide.

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

**(ii)** heating the mixture of 5cm<sup>3</sup> of hydrogen peroxide with five potato discs.

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

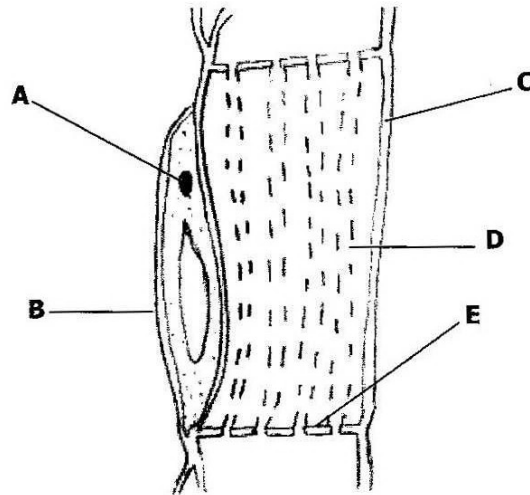
**(c)** Suggest **two** other characteristics of a biological catalyst not demonstrated in **(a)** and **(b)** of this question.

**1** .....  
.....  
.....

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

**[Total: 8]**

2 **Figure 2.0** shows cells taken from a vascular tissue in a plant.



**Figure 2.0**

(a) (i) Identify the specialised cell in **figure 2.0**.

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

(ii) Name **one** feature in **figure 2.0** which enabled you to identify the specialised cell in (a) (i) above.

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

(iii) Which letters on **figure 2.0** correspond to the following structures?

1 nucleus .....  
 2 cytoplasm ..... [2]

(b) Give **two** functions of the cell labelled **B**.

1 .....  
 2 ..... [2]

(c) With reference to the specialised cell in **figure 2.0**:

(i) Name the process by which substances are transported in the specialised cell.

.....

..... [1]

(ii) Suggest **two** substances transported by the specialised cell.

**1** .....

.....

**2** .....

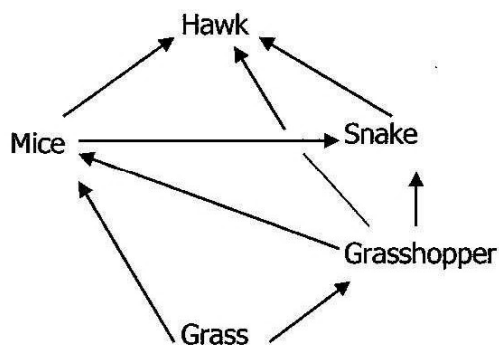
..... [2]

**[Total: 9]**



- [Total: 9]**

- 4 **Figure 4.0** shows feeding relationship of organisms in an ecosystem.



**Figure 4.0**

- (a) Which of the named organisms represents?
- (i) a producer .....
- (ii) a primary consumer ..... [2]
- (b) What is the primary source of energy in **figure 4.0** above?
- Source of energy** ..... [1]
- (c) (i) State the form in which energy flows from one trophic level to another.
- ..... [1]
- (ii) Explain what happens to the energy named in (c) (i) as it passes from one trophic level to the next.
- ..... [2]
- (d) (i) Identify **two** organisms in **figure 4.0** which are both secondary consumers and tertiary consumers.
- Organism 1.** .....
- Organism 2.** ..... [2]
- (ii) Using **named** organisms in **figure 4.0** construct the longest food chain.
- ..... [1]

**[Total: 9]**

- 5 **Table 5.0** below shows a cross between a brown male pig labelled pig **B**, with two female pigs brown (pig **A**) and white, pig **C**.

Pig	Phenotype	Offspring	
		White	Brown
<b>B</b>	Brown male	Nil	Nil
<b>A</b>	Brown female	4	12
<b>C</b>	White female	8	8

**Table 5.0**

- (a) Explain why pig **B** had no offspring.  
 .....  
 ..... [1]
- (b) From the results in **table 5.0** and using the symbol **B** for dominant allele and **b** for recessive allele,  
 (i) Identify the recessive phenotype of the skin colour of the pigs.  
 ..... [1]
- (ii) Suggest the genotypes of pigs **A** and **C**  
**Genotype pig A** .....  
**Genotype pig C** ..... [2]
- (c) Using a genetic diagram, show the results of crossing pig **B** with pig **C**.

[5]

**[Total: 9]**



**Section B [36 marks]**

Answer any **three** questions.

All answers should be in sentence form in paragraphs.

- 6** (a) What are the characteristics of the alveolus as a respiratory surface? [5]  
 (b) Describe the mechanism involved in inspiration in human beings. [7]  
**[Total: 12]**
- 7** (a) (i) Explain the causes of coronary heart disease. [8]  
 (ii) Discuss how coronary heart disease can be prevented. [2]  
 (b) Describe the functions of lymph nodes in disease prevention. [2]  
**[Total: 12]**
- 8** The following are parts associated with the skeletal system.
- 1** Vertebrae column
  - 2** Skull
  - 3** Skeletal muscle
- Describe
- (a) their characteristics. [6]  
 (b) their functions. [6]  
**[Total: 12]**
- 9** (a) What is meant by tropic response? [2]  
 (b) Discuss the role of auxins in a  
 (i) shoot receiving light from one side. [5]  
 (ii) radicle growing horizontally. [5]  
**[Total: 12]**
- 10** (a) Explain how flowering plants get rid of excess and unwanted substances from their bodies. [4]  
 (b) Discuss the importance of homeostasis in mammals. [8]  
**[Total: 12]**



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