

Centre Number	Candidate Number

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

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

**BIOLOGY**  
**PAPER 2 Theory**

**5090/2**

**Monday**

**7 NOVEMBER 2011**

**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 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.

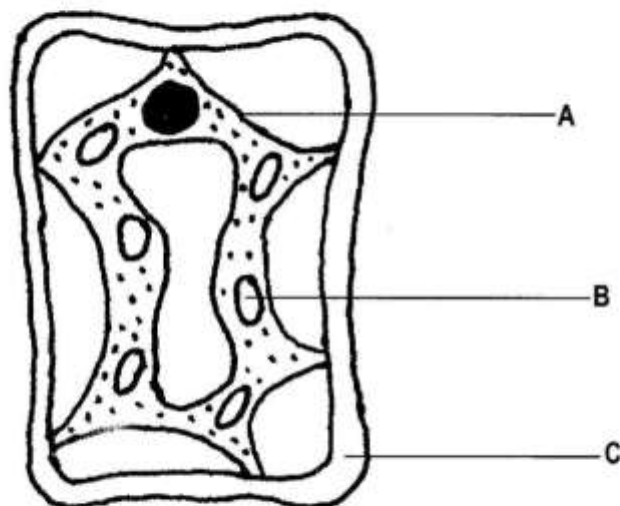
**Cell phones are not allowed in the examination room.**

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 1.1** shows a plant cell which has been put in a concentrated salt solution.



**Figure 1.1**

- (a) Identify the parts labelled **A** and **B**.

**A** ..... [2]  
**B** .....

- (b) (i) What happened for the cell to reach this state?

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

- (ii) State the term given to the cell in this condition.

..... [1]

- (iii) How can this condition can be reversed?

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

- (c) Give **one** reason why the structure labelled **C** remained in its natural state.

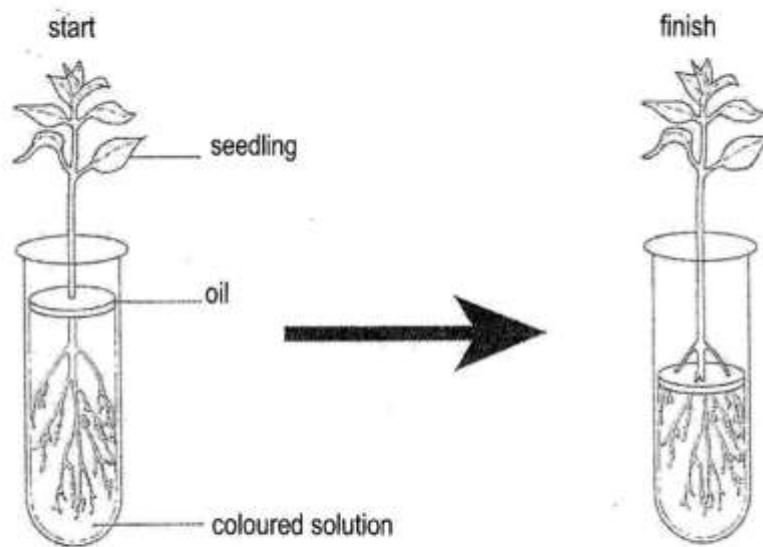
..... [1]  
 .....

- (d) Give **two** differences between a plant cell and an animal cell.

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

**[Total 9]**

- 2** **Figure 2.1** shows an experiment to investigate the movement of coloured solution in a plant.



**Figure 2.1**

- (a) Name the process by which

- (i) water in the solution was absorbed by the plant.

.....

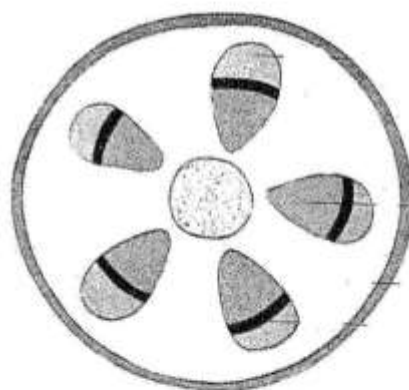
- (ii) coloured solute in the solution was absorbed by the plant.

..... [2]

- (b) Why was oil put on top of the coloured solution?

..... [1]

- (c) **Figure 2.2** shows the cross section of the stem obtained from **Figure 2.1** at the end of the experiment.



**Figure 2.2**

(i) Using the letter **X**, label the part on the figure which was stained by the dye. [1]

(ii) Identify the part you have labelled **X** on the **Figure 2.2**.

..... [1]

(iii) Name **two** substances transported by part **X** and give **one** function for each.

Name: .....

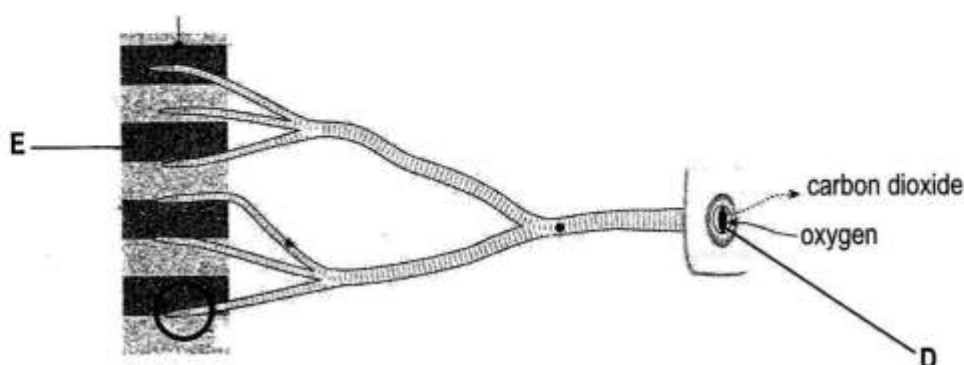
Function: .....

Name: .....

Function: ..... [4]

[Total 9]

3 **Figure 3.1** shows part of the respiratory system of an insect.



**Figure 3.1**

(a) Identify the parts labelled **D** and **E**.

Part **D** .....

Part **E** ..... [2]

(b) Explain how oxygen from the atmosphere is able to reach the tissue labelled **E**.

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

(c) Explain how the energy released from respiration in an insect is used.

.....  
 .....  
 ..... [3]

(d) State **two** ways in which the respiratory system shown differs from that of a fish.

.....

.....

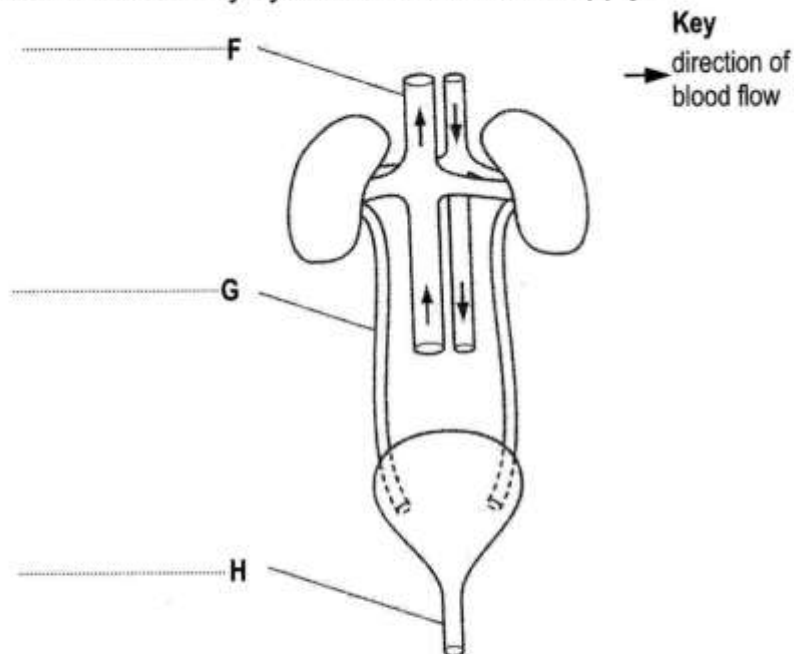
.....

.....

[2]

[Total 9]

4 **Figure 4.1** shows the urinary system and its blood supply.



**Figure 4.1**

(a) On **Figure 4.1** label structures **F**, **G** and **H**. [3]

(b) State **two** processes that are involved in urine formation.

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

(c) **Table 4.1** shows the relative quantities of several substances in the blood in the renal artery and renal vein.

Substance	Relative quantities in blood in renal artery (arbitrary units)	Relative quantities in blood in renal vein (arbitrary units)
Glucose	10.0	9.5
Oxygen	100.0	40.0
Sodium salts	32.0	27.0
Urea	6.0	2.5
Water	180.0	175.0

Explain what happens in the kidney to bring about the changes in the relative quantities of

glucose .....

.....

oxygen .....

.....

sodium salts: .....

.....

urea .....

.....

.....

..... [4]

[Total 9]

- 5 In an experiment to demonstrate the inheritance of coat colour in cattle, a roan bull was repeatedly crossed with a roan cow and produced roan, white and red calves.

(a) Which coat colour is as a result of co-dominance?

..... [1]

(b) Determine the genotypes of the three coat colours, given that  $C^R$  is gene for red colour and  $C^W$  is gene for white colour.

.....

.....

.....

..... [3]

(c) Show using a genetic diagram the possible offspring which could be produced when a red bull was crossed with a roan cow.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total 8]

### Section B [36 marks]

Answer any **three** questions.

All answers should be in sentence form in paragraphs.

- 6 (a) (i) Define the term growth. [1]  
 (ii) Describe the process of growth in plants from a seed to a seedling. [5]  
 (b) Outline the life cycle of a housefly. [6]  
**[Total: 12]**
- 7 (a) What is meant by the term hormone? [2]  
 (b) Describe the function of auxins in plants. [4]  
 (c) Relate the effects of auxins in geotropism. [6]  
**[Total: 12]**
- 8 (a) Describe the structure of a synovial joint and explain the functions of its parts. [6]  
 (b) Differentiate the following:  
 (i) tendon and ligament, [6]  
 (ii) ball-and-socket joint and hinge joint. [6]  
**[Total: 12]**
- 9 (a) Explain the term immunity to disease. [2]  
 (b) Distinguish between active immunity and passive immunity, giving **one** example in each case. [5]  
 (c) Discuss how immunity to disease is reduced. [5]  
**[Total: 12]**
- 10 (a) Describe how nitrogen is cycled within the ecosystem. [6]  
 (b) Describe the importance of each of the physical components of soil. [6]  
**[Total: 12]**



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