

Candidate Name: _____

Centre Number		Candidate Number												

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

Biology
Paper 3 Practical Test

5090/3

Friday

29 JULY 2016

Additional materials:

As listed in Instructions to Supervisors.

Time: 1 hour 15 minutes

Instructions to candidates

Write your name, centre number and candidate number in the spaces provided at the top of this page.

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

Answer **both** questions.

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

Use sharp **HB** pencils for your drawings. Coloured pencils and crayons should **not** be used.

Information for candidates

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

Cell phones are not allowed in the examination room.

FOR EXAMINER'S USE	
1	
2	
Total	

1 You are provided with food material **A**.

Transfer two spatula fulls of food material **A** into the beaker labelled **A1**.
Add 50cm³ of distilled water to **A1** and shake the contents.

(a) (i) Test 2cm³ of solution **A1** for reducing sugars and record the results in the table provided below.

Reagent(s)	Volume of test reagent(s)	Observation(s)	Conclusion

[4]

(ii) Describe the method you used to obtain the results in **Part (a) (i)** above.

.....

.....

..... [1]

(iii) Explain what the observation has shown in terms of sugar content of solution **A1**.

.....

..... [1]

(b) Test 2cm³ of solution **A1** for the presence of proteins and record the results in the table below.

Reagent	Volume of test reagent	Observation(s)	Conclusion

[4]

- (c) (i) Place food materials of **A1** on a white tile and carry out the test for starch and complete the table below.

Reagent	Volume of test reagent	Observation(s)	Conclusion

[4]

- (ii) Explain why the food material was placed on a white tile.

.....

..... [2]

- (d) (i) State the use of reducing sugars in animals.

.....

..... [1]

- (ii) State **one** storage organ for starch in plants.

.....

..... [1]

- (iii) Explain why the food sample **A** was ground to small pieces.

.....

..... [2]

[Total: 20]

2 You are provided with specimens **M1**, **M2** and **M3**.

(a) (i) Make a drawing of specimen **M1** and label any **four** parts.

[8]

(ii) Measure the widest part of the drawing and draw a line where the measurement was taken.

Measurement of drawing [2]

(b) Calculate the magnification of the drawing.

Magnification = [3]

(c) (i) Compare the outward appearance of specimens **M2** and **M3** with **M1**.

M2

M3 [2]

(ii) Describe the process that caused the condition of **M2**.

..... [3]

(iii) What could be done to the plant of **M3** to make its leaf look like that of **M1**?

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

[Total: 20]



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EXAMINATIONS COUNCIL OF ZAMBIA



Examination for School Certificate Ordinary Level

Biology

5090/6

Paper 6 Alternative to Practical

Thursday

17 NOVEMBER 2016

Additional Information:

Answer paper

Diagram Booklet

Print Version of Braille Paper

Time 1 Hour 15 Minutes

Instructions to Candidates

Write your name, centre number and candidate number on the answer paper.

There are **three (3)** questions in this paper.

Answer **all** questions.

Write your answers on the answer paper.

Information for Candidates

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

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- 1 A respiratory system of a *Tilapia* fish was examined using a hand lens and structures were seen enclosed in a chamber.
- (a) (i) Name the organ involved in gaseous exchange in the chamber. [1]
 - (ii) Name the **three** parts that make up the organ involved in gaseous exchange in (a)(i) above. [3]
 - (iii) How many gills are on each side of the head of a fish? [1]
 - (b) Describe the mechanism of inspiration in the fish. [4]
 - (c) State the Kingdom and the Class of a *Tilapia*.
 - (i) Kingdom [1]
 - (ii) Class [1]
 - (d) Name the **two** types of respiration. [2]
 - (e) State the respiratory surface in
 - (i) man. [1]
 - (ii) insects. [1]

[Total: 15 marks]

- 2 Bean seeds were put in moist cotton wool at room temperature and periodically moistened. By the fourth day it was observed that the seeds had increased in size and had germinated.
- (a) (i) Explain why the seeds had increased in size. [1]
 - (ii) Why was it necessary to periodically wet the cotton wool? [1]
 - (iii) What is the importance of water to a germinating seed? [2]
 - (iv) Which part of the seed develops into a new plant after germination? [1]
 - (v) Apart from moisture, state **two** other conditions needed for germination of seeds. [2]
 - (b) State the food nutrients which are found in bean seeds. [2]
 - (c) What is the role of enzymes in germination? [2]

[Total: 11 marks]

- 3** The femur is a bone in the hind limbs of mammals.
- (a) (i)** Describe the external structure of the femur. [2]
- (ii)** The bone was measured and its length was 120mm. A drawing of the bone was made. The drawing was measured and its length was 180mm. Calculate the magnification of the drawing. Show clearly all the stages in your calculation. [2]
- (b) (i)** Name the bones of the lower hind limb which connect to the femur. [2]
- (ii)** What type of joint is found between the femur and
1. the bones of the lower limb? [1]
 2. the pelvic bones? [1]
- (c)** Why is a bone considered a living tissue? [1]
- (d)** State any **three** functions of the skeleton of a mammal. [3]
- (e)** State the **three** types of skeleton exhibited by living organisms. [2]

[Total: 14 marks]



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EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

Biology

5090/6

Paper 6

Alternative to Practical

Friday

29 JULY 2016

Additional materials:
Answer paper
Diagram Booklet

PRINT VERSION OF BRAILLE PAPER

Time 1 hour

Instructions to Candidates

Write your name, centre number and candidate number on the answer paper.

There are **three (3)** questions in this paper.

Answer **all** questions.

Write your answers on the answer paper.

Information for Candidates

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

Cell phones are not allowed in the examination room.

Answer all questions

- 1** Three test tubes were labelled **A**, **B** and **C**. In each test tube 10cm³ of gelatine solution was added. The test tubes were then treated as follows:

Test tube **A**: 5cm³ of distilled water was added.

Test tube **B**: 5cm³ of fresh pineapple juice was added

Test tube **C**: 5cm³ of pineapple juice that had been boiled and cooled was added.

The test tubes were allowed to stand for 25 minutes. Then the content in the test tubes were examined.

(a) What is the purpose of test tube **A**?
..... [1]

(b) State **two** conditions that were kept constant during the experiment.
..... [2]

(c) In which of the **three** test tubes was there no reaction taking place?

(i) Test tube:
Reason: [2]

(ii) Test tube:
Reason: [2]

(d) What is the effect of the following on an enzyme?

(i) High temperature..... [1]

(ii) Low temperature [1]

(e) State any other **two** properties of enzymes.

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

[Total: 11]

2 A potted plant was placed inside a cupboard for 48 hours. When a leaf was tested for starch using iodine solution, a brown colour was observed.

(a) Why was the plant left in the cupboard for 48 hours?

..... [1]

(b) Briefly outline the **four** steps you would follow in testing a leaf for starch, giving a reason for each step taken.

(i)

Reason

..... [2]

(ii)

Reason

..... [3]

(iii)

Reason

..... [2]

(iv)

Reason

..... [3]

(c) What conclusion could be drawn from the results observed on the leaf?

.....

..... [1]

(d) Write **three** differences between photosynthesis and respiration.

(i)

.....

(ii)

.....

(iii)

..... [3]

(e) Write the word equation for photosynthesis.

..... [2]

[Total: 17]

3 A learner carried out an experiment on two bean seeds **A** and **B**. Seed **A** was soaked in water for 72 hours while seed **B** was not soaked. At the end, seed **A** was taken out of water. The seeds were examined using a hand lens.

(a) Which visible differences were seen on both seeds?

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

(b) What happened to the seed that was soaked?

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

(c) (i) Explain why it is easier to crack open the soaked seed.

..... [1]

(ii) What is the importance of the explanation in (c) (i) in the germination of seeds?

..... [1]

(d) (i) What is the name of the outer coat of the seed?

..... [1]

(ii) Name the **two** halves of the seed.

..... [1]

(iii) Explain the role of the structures named in (d) (i).

..... [1]

(e) Distinguish between the germination of the bean seed and maize seed

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

[Total: 12]



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EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Biology

5090/6

Paper 6 Alternative to Practical

Wednesday

22 NOVEMBER 2017

Additional Materials:

Answer paper

Diagram Booklet

Print Version of Braille Paper

Time 1 Hour 15 Minutes

Instructions to Candidates

Write your name, centre number and candidate number on the answer paper.

There are three (3) questions in this paper.

Answer all questions.

Write your answers on the answer paper.

Information for Candidates

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

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- 1** A learner carried out an experiment to show the action of salivary amylase at room temperature. The preparations were done as follows:

Test tube A = contained 3.0cm^3 of saliva with 1% starch solution.

Test tube B = contained 3.0cm^3 of boiled saliva with 1% starch solution.

Test tube C = contained 3.0cm^3 of distilled water with 1% starch solution.

After 30 minutes, the solutions were tested with iodine solution.

- (a)** What observations were seen in each of the test tubes?

Test tube A: [1]

Test tube B: [1]

Test tube C: [1]

- (b) (i)** With the results obtained in test tube **A** above, what is the conclusion?

..... [1]

- (ii)** Give a reason for your answer in **(b) (i)** above.

..... [3]

- (c) (i)** What was the purpose of test tube **C**?

..... [1]

- (ii)** Give a reason for the results obtained in test tube **B**.

..... [1]

- (iii)** State **two** other properties of an enzyme.

..... [2]

[Total: 11 marks]

2 Two potted maize seedlings **A** and **B** were used in an experiment to investigate a plant response. Seedling **A** was put in a box with a small opening on one side while seedling **B** was placed in another box with a small opening on top. Both seedlings were left outside the room for five days.

- (a) (i) Describe the direction of growth of each of the seedlings.
- Seedling A:** [1]
- Seedling B:** [1]
- (ii) Name the stimulus in this experiment.
- [1]
- (iii) State the type of response exhibited by the two seedlings.
- [1]
- (iv) What is the significance of the response mentioned in (a) (iii) above to the plant?
- [2]
- (v) Name a plant hormone responsible for the response observed in the seedlings.
- [1]
- (b) How do roots respond to light?
- [1]
- (c) Name **three** other responses which are exhibited by plants in their environment.
- [3]
- (d) Write **two** differences between the type of response exhibited by maize plants and that exhibited by cockroaches to light.
- [2]

[Total: 13 marks]

- 3 A grade twelve learner was provided with a leaf with white and green patches which had been exposed to sunlight for eight hours. The learner tested the leaf for starch using the following steps:

Step 1: The leaf was first boiled in water for 2 minutes.

Step 2: The leaf was then boiled in ethanol using a water bath.

Step 3: The leaf was then submerged in warm water.

Step 4: The leaf was spread on a white tile.

Step 5: The leaf was flooded with iodine solution on the white tile.

- (a) (i) State the reason why the leaf was boiled in water.
..... [1]
- (ii) Why was the leaf boiled in ethanol?
..... [1]
- (iii) Give a reason why the leaf in ethanol was heated using a water bath.
..... [1]
- (iv) State the colour and the texture of the leaf after boiling it in ethanol.
Colour: [1]
Texture: [1]
- (v) Give a reason for placing the leaf in warm water in step 3.
..... [1]
- (vi) Why was the leaf spread on a white tile in step 4?
..... [1]
- (vii) After flooding the leaf with iodine solution, what colour changes were observed in the white patches and green patches?
White patch: [1]
Green patch: [1]

(b) What term is used to describe a leaf with green and white patches?
..... [1]

(c) Name the raw materials necessary for photosynthesis to take place.
.....
..... [2]

(d) What is the importance of photosynthesis to human beings?
.....
.....
..... [2]

(e) Name **two** organs in which the plants store the end products of photosynthesis.
.....
..... [2]

[Total: 16 marks]



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Candidate Name _____

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EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Biology

5090/3

Paper 3 Practical Test

Thursday

17 NOVEMBER 2016

Additional materials:

As listed in Instructions to Supervisors

Time 1 hour 15 minutes

Instructions to Candidates

Write your name, centre number and candidate number in the spaces provided at the top of this page.

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

Answer **both** questions.

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

Information for candidates

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

Cell phones are not allowed in the examination room.

FOR EXAMINER'S USE	
1	
2	
Total	

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Answer both questions

1 You are provided with specimens **A** and **B** which are soil samples.

(a) Using a hand lens, identify the differences between the two specimens **A** and **B**.

.....
.....
.....
.....

[2]

(b) Place 10g of sample **A** in a funnel labelled **A** fitted with a filter paper and placed in a conical flask. Place 10g of sample **B** in a funnel labelled **B** fitted with a filter paper and placed in a conical flask.

Pour 10cm³ of water into each soil sample in the funnel.

Measure and record the amount of water collected in 3 minutes in the table below and make a conclusion.

(i)

Specimen	Amount of water collected in cm ³ in 3 minutes	Conclusion
A		
B		

[3]

(ii) Name the types of soil in specimen **A** and **B**.

Specimen A

Specimen B

[2]

(iii) Name the physical property of soil being determined in the experiment.

.....

[1]

- (iv) State the disadvantages to the plants growing in each of the specimens of soil in relation to the property observed above.

Specimen **A**: Disadvantages

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

Specimen **B**: Disadvantages

- 1
2 [2]

- (v) Suggest ways in which specimen **A** and **B** can be improved and give reasons.

Specimen **A**

Ways of improving specimen **A**

-
..... [1]

Reasons:

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

Specimen **B**

Ways of improving specimen **B**

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

Reasons:

- 1**
-
- 2**
-
- 3**
- [3]
- [2]

Total 20 marks

- 2 (a)** You are provided with solutions **A** and **B**. Test the pH of the solutions using litmus paper provided on a white tile. Using a dropper, add 3 drops of solution **A** onto one blue and one red litmus paper. Using another dropper, add 3 drops of solution **B** onto one blue and one red litmus paper. Record your observations and conclusions in the table below.

Table 1: Litmus Paper Test

Colour of Litmus paper used	Solution	Observation	Conclusion
Blue	A		
Red	A		
Blue	B		
Red	B		

[8]

- (b) (i)** State the digestive organ in the human body where a solution similar to solution **A** would be found. Give a reason for your answer.

Organ:

Reason:

[2]

- (ii)** State **two** organs in the human body where a solution similar to solution **B** would be found. Give a reason for your answer.

Organ 1

2

Reasons:

1

.....

2

.....[4]

(iii) In which of the solutions **A** or **B** would protein digestion occur?

Solution:

Reason:

.....

..... [2]

(c) Solution **A** and **B** provided have the same nutrient composition. Using the reagents provided, determine the nutrient composition of the solutions. Write the test method and record your observations and conclusions in the table below.

Table 2: Protein Test

Solution	Method	Observation	Conclusion
A			
B			

[4]

Total 20 marks



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EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

Biology

5090/2

Paper 2 Theory

Tuesday

25 JULY 2017

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 at 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.

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FOR EXAMINER'S USE	
Section A	
Section B	
Total	

Section A Short answer questions [44 marks]

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

- 1 (a)** Complete **Table 1.0** showing parts of a microscope and their functions.

PART	FUNCTION
(i)	Collects and reflects light onto specimen on the stage
Diaphragm	(ii)
(iii)	Magnifies the image further
Stage	(iv)
(v)	Brings the image into sharp focus especially when the specimen is being viewed at high magnification.

Table 1.0

[5]

- (b)** State **three** parts of a plant cell which can be easily seen under a light microscope.

(i)

(ii)

(iii)

[3]

[Total: 8 marks]

2 Figure 2.1 and 2.2 show two endocrine glands labelled P and Q respectively.

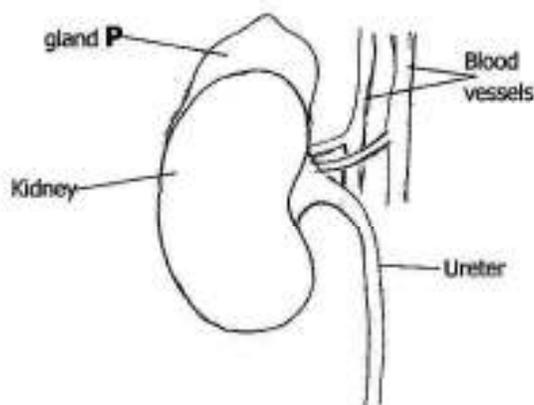


Figure 2.1

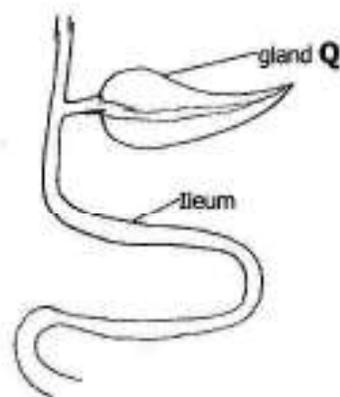


Figure 2.2

(a) (i) Identify the endocrine glands P and Q.

Gland P

Gland Q [2]

(ii) State **one** hormone produced by each gland.

Hormone produced by gland P

Hormone produced by gland Q [2]

(iii) Explain how the hormone produced by gland P stated in (a) (ii) above plays a role in coordination.

.....

 [3]

(b) Explain the other role played by gland Q apart from producing hormones.

.....

 [2]

[Total: 9 marks]

3 Figure 3.0 shows the muscles in a bent limb in a grasshopper.

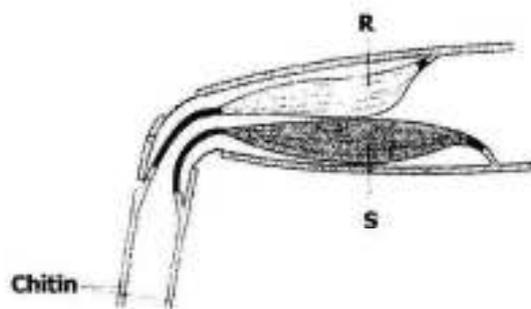


Figure 3.0

(a) Identify muscles **R** and **S**.

Muscle R

Muscle S [2]

(b) In order to straighten the limb what happens to muscle **R** and **S**?

Muscle R

Muscle S [2]

(c) State the term used to refer to the action of muscle **R** and **S**.

..... [1]

(d) Identify the type of skeleton shown in **figure 3.0**.

..... [1]

(e) State **three** functions of the skeleton in **figure 3.0**.

(i)

(ii)

(iii) [3]

[Total: 9 marks]

- 4 **Figure 4.0** shows the process involved in using a dialysis machine by a patient suffering from kidney failure.

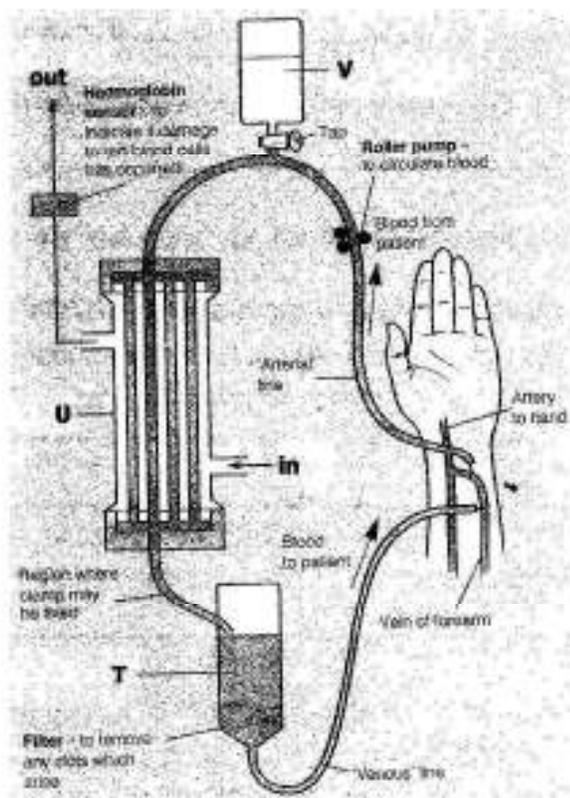


Figure 4.0

- (a) (i) Which of the labelled parts **V**, **U** and **T** is the dialysis machine?
 [1]
- (ii) Which labelled parts, **V**, **U** and **T** removes gas bubbles to prevent air lock?
 [1]
- (b) Suggest **two** reasons why both tubes, to and from the dialysis machine are connected to the vein and not the artery.
1

2
 [2]

- (c) Explain how important nutrients like glucose, amino acids and salts are prevented from leaving blood in the dialysis machine.

.....
.....
.....
.....

[2]

- (d) State **two** disadvantages of using a dialysis machine by patients with kidney failure.

(i)
.....
(ii)
.....

[2]

- (e) Suggest **one** other method of treatment of kidney failure in a patient.

.....
.....

[1]

[Total: 9 marks]

5 A pure breeding black bull was crossed with a pure breeding red cow. All the resulting offspring were black.

(a) Using letter **B** or **b** for alleles;

(i) Which allele was dominant for skin colour?

Allele: [1]

(ii) What was the genotype for the parent black bull?

Genotype: [1]

(b) Using a genetic diagram, show the resulting offspring if the offspring black bull was crossed with the parent red cow. [5]

(c) Suggest what could happen to the pure breeding black bull or red cow to cause them to produce a black and white offspring.

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

[Total: 9 marks]

[Turn over

Section B Essay questions [36 marks]

Answer any three questions from this section. All answers must be in complete sentences and paragraphs.

6 Explain how the internal parts of a leaf are adapted for photosynthesis. [12]

[Total: 12 marks]

7 (a) Explain why

(i) Persons with blood group **AB** are referred to as universal recipients. [4]

(ii) A person with blood group **A** cannot donate blood to a person with blood group **B**. [4]

(b) Explain the importance of taking **named** precautions before blood transfusion can be done. [4]

[Total: 12 marks]

8 (a) Describe the production of adenosine triphosphate (ATP) during respiration. [3]

(b) Suggest ways in which respiration is important to living things. [3]

(c) Compare and contrast the respiratory surface of humans and fish. [6]

[Total: 12 marks]

9 (a) Explain the advantages and disadvantages of vegetative propagation. [5]

(b) Describe the process of fertilization in flowering plants. [7]

[Total: 12 marks]

10 (a) Using a pond as an example, describe the features of an ecosystem. [6]

(b) Explain the effect of agriculture on an ecosystem. [6]

[Total: 12 marks]



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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.

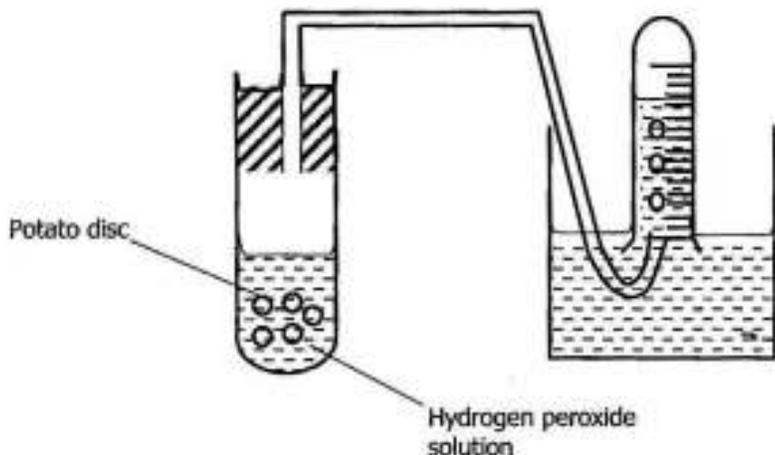


Figure 1.0

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 ³	0	-	1.5cm ³
2	5cm ³	5	Boiled	1.5cm ³
3	5cm ³	5	Raw	10.0cm ³

- (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 5cm³ of hydrogen peroxide.

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

(ii) heating the mixture of 5cm³ 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.

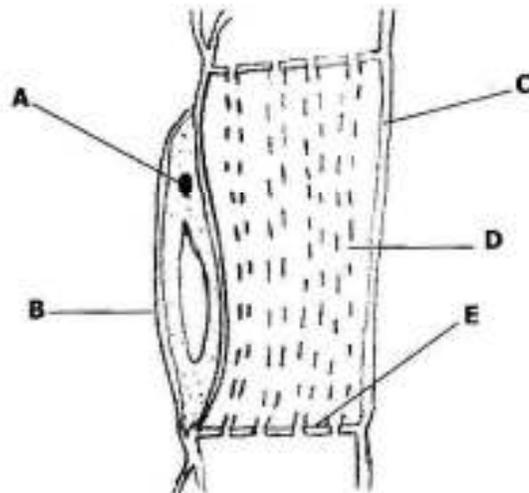


Figure 2.0

- (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]

3 Figure 3.0 shows a diagram of a tooth.

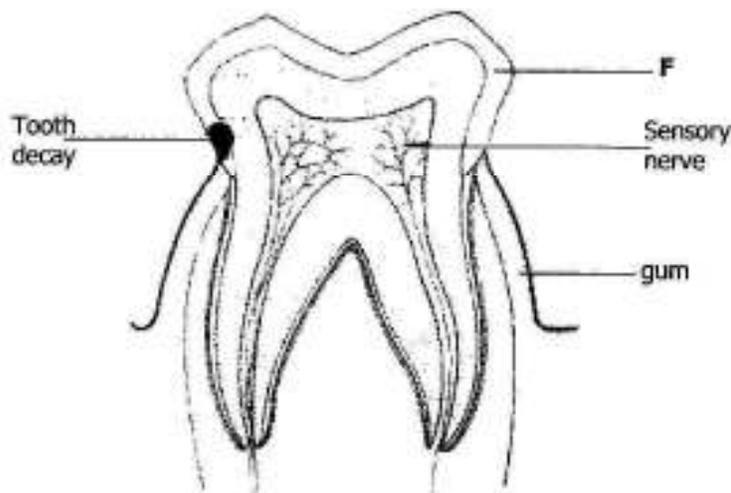


Figure 3.0

- (a) (i) Identify the type of tooth shown in figure 3.0 above and state its function.
Type of tooth
Function
..... [2]
- (ii) Label on the diagram the following parts of a tooth.
1 Blood capillaries
2 Dentine [2]
- (b) (i) Mention **two** elements or ions which enable part F to perform its functions more efficiently.
Element or ion 1.
Element or ion 2. [2]
- (ii) Suggest how tooth decay can be brought about.
.....
..... [2]
- (iii) Give **one** way in which tooth decay can be prevented.
.....
..... [1]

[Total: 9]

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

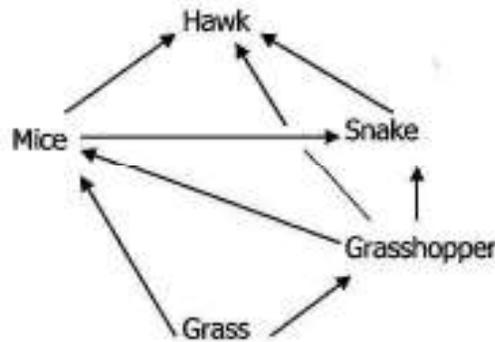


Figure 4.0

- (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	Brown male	Nil	Nil
A	Brown female	4	12
C	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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EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

Biology

5090/1

Paper 1 Multiple Choice

Monday

30 JULY 2018

Additional Materials:

- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

Time: 50 minutes

Instructions to Candidates

Look at the left hand side of your Answer card. Ensure that your **name**, the **school/centre name** and **subject paper** are printed. Also ensure that the **subject code**, **paper number**, **centre code**, **your examination number** and the **year** are printed and shaded. Do not change the already printed information.

There are **forty (40)** questions in this paper.

Answer all questions.

For each question there are four possible answers: **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the Answer Card provided.

Read very carefully the instructions on the answer sheet.

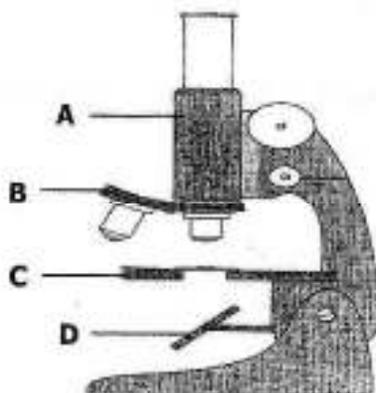
Information for Candidates

Each correct answer will score one mark.

Any rough working should be done in this Question Paper.

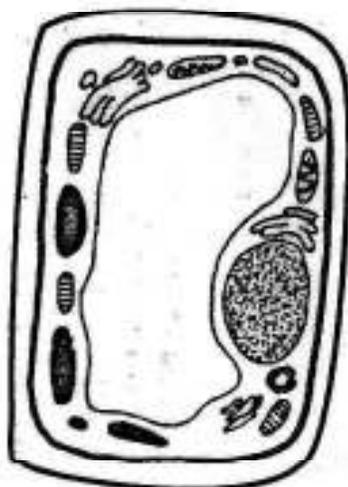
Cell phones are not allowed in the examination room.

- 1 The diagram shows a light microscope.



Which labelled part supports the objective lens and is rotated to bring the lens of desired magnification into position?

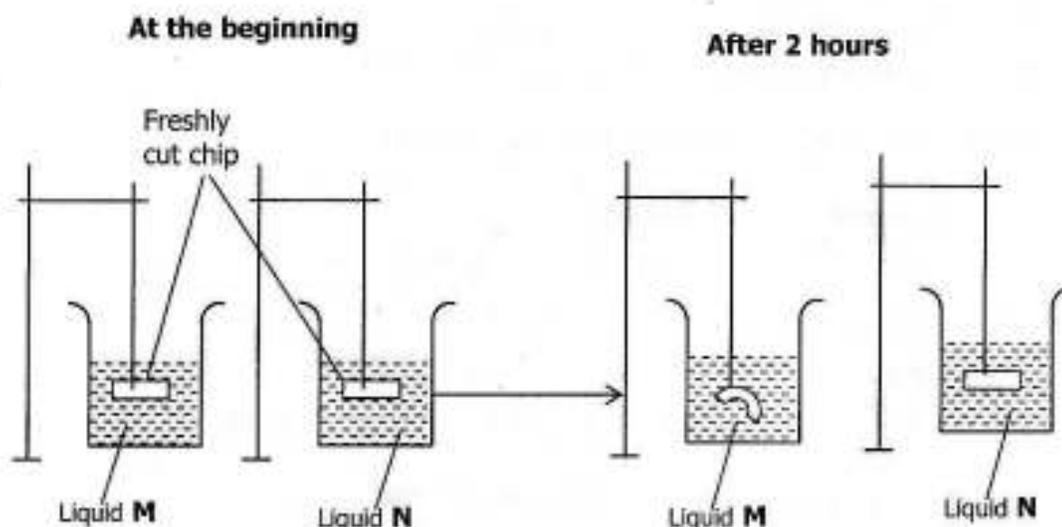
- 2 The diagram shows a cell as seen under an electron microscope.



What type of cell is shown?

	Type of cell	Reason
A	Animal	Outer layer is cell membrane
B	Animal	No chromosomes are visible
C	Plant	Presence of cytoplasm
D	Plant	Cell wall is visible

- 3 The diagram shows freshly cut potato chips, one chip suspended in liquid **M** and another suspended in liquid **N**.



Which one of the following correctly identifies liquids **M** and **N**?

	Liquid M	Liquid N
A	Concentrated sugar solution	Pure water
B	Dilute sugar solution	Concentrated sugar solution
C	Pure water	Concentrated sugar solution
D	Pure water	Dilute sugar solution

- 4 Which of the following best describes the function of enzymes?
- A To accelerate metabolic activities.
 - B To breakdown food molecules.
 - C To catalyse digestion.
 - D To make biochemical reactions possible.
- 5 Which combination of chemical elements is present in a protein molecule?

	Carbon	Hydrogen	Nitrogen	Oxygen
A	✓	✓	X	X
B	✓	✓	✓	X
C	✓	✓	X	✓
D	✓	✓	✓	✓

Key

✓ = element present

X = element absent

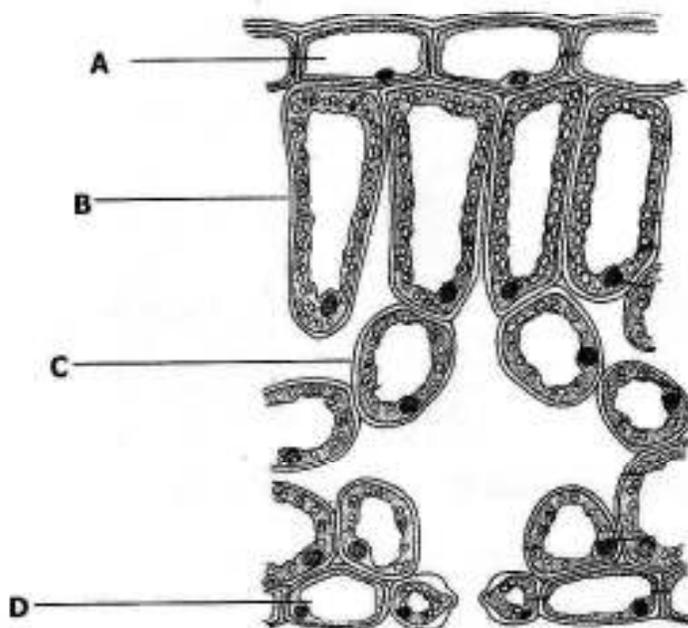
6 Which of the following people need a lot of carbohydrates in their diet?

- A Lactating mother
- B Malaria patient
- C Manual worker
- D Sedentary worker

7 Which of the following correctly shows a plant nutrient and its function?

Element	Function
A Calcium	Formation of middle lamina
B Nitrogen	Activates enzymes
C Potassium	Formation of ATP and NADP
D Sulphur	Forms part of the chlorophyll molecule

8 The diagram shows the internal structure of a leaf.

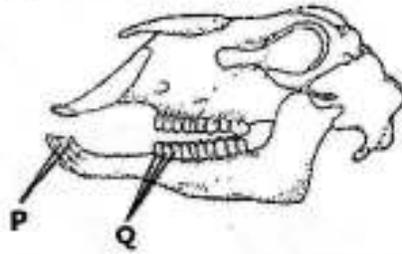


In which labelled cells is the rate of photosynthesis highest on a sunny day?

9 What type of nutrition is carried out by a Rhizopus?

- A Chemotrophic
- B Parasitic
- C Phototrophic
- D Saprophytic

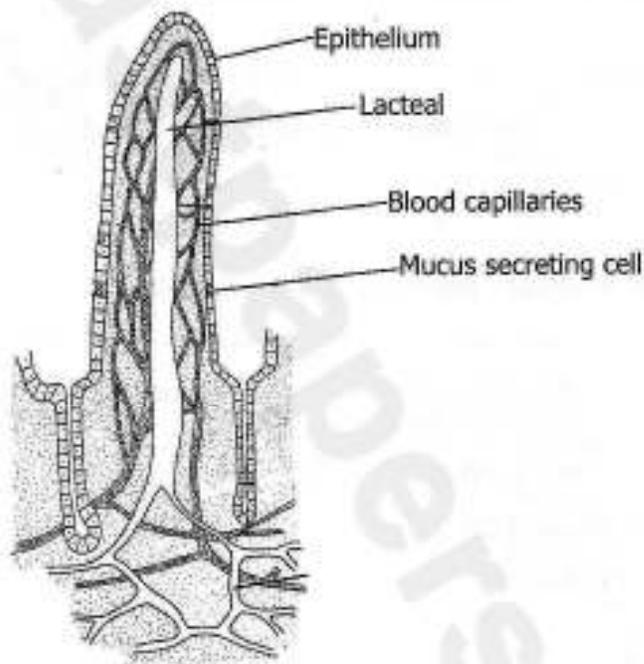
- 10 The diagram shows a skull of a herbivore.



What type of teeth are represented by **P** and **Q**?

	P	Q
A	Canines	Molars
B	Canines	Incisors
C	Incisors	Premolars
D	Incisors	Molars

- 11 The diagram shows a villus.

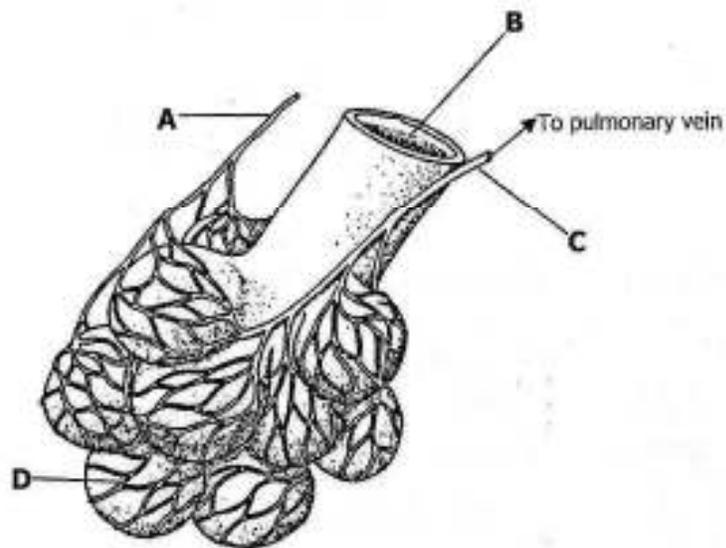


In which of the labelled structures are amino acids and glucose absorbed and transported?

- A** Lacteal
B Blood capillaries
C Epithelium
D Mucus secreting cell

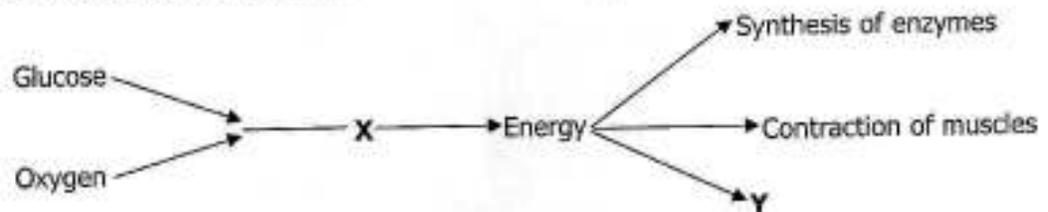


- 12 The diagram shows some of the structures in a human lung.



At which point is the oxygen concentration lowest?

- 13 Glucose is an energy source needed for body processes to occur.



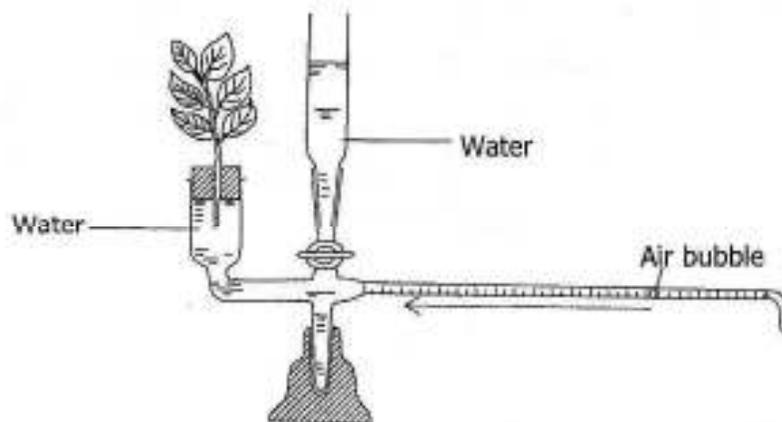
What processes are represented by X and Y?

	X	Y
A	Photosynthesis	Growth
B	Photosynthesis	Respiration
C	Respiration	Growth
D	Respiration	Photosynthesis

- 14 Which of the following forms of drug abuse leads to the highest risk of infection with the Human Immuno-deficiency Virus (HIV)?

- A Cannabis (dagga) smoking
- B Cigarette smoking
- C Drinking alcohol
- D Injecting heroin

- 15 The diagram shows a potometer.



Which of these factors will cause the fastest movement of the air bubble in the direction shown?

- A Decreased temperature
 - B Decreased wind speed
 - C Increased humidity
 - D Increased light intensity
- 16 Mary has blood group A.

Which of the following is true about Mary's blood?

	Antigens on red blood cells	Antibodies in plasma
A	Antigen A	Anti-B antibodies
B	Antigen B	Anti-A antibodies
C	Antigen A and B	Both anti-A and anti-B antibodies
D	No antigen	No antibodies

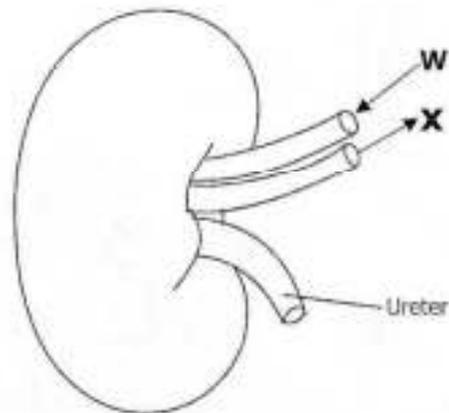
- 17 The table shows features of some blood vessels and the direction of blood flow in them.

	Feature		Direction of blood flow
	Muscle	Lumen	
1	Thick	Narrow	Away from the heart
2	Thick	Wide	Away from the heart
3	Thin	Narrow	Towards the heart
4	Thin	Wide	Towards the heart

Which blood vessel is the pulmonary artery?

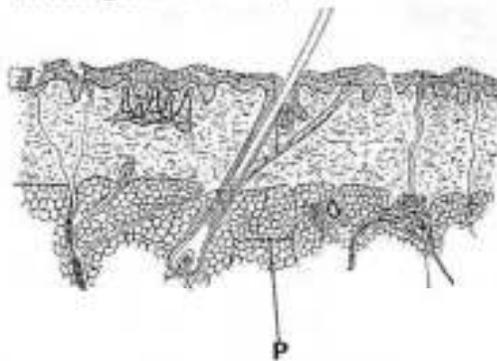
- A 1
- B 2
- C 3
- D 4

- 18 The diagram shows a human kidney and its blood supply.



Compared with the blood in vessel **W**, the blood in vessel **X** has ...

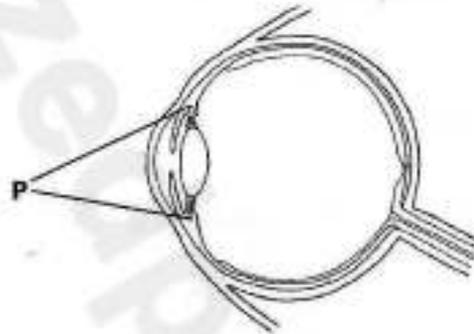
- A less urea and less oxygen.
 - B less urea and more oxygen.
 - C more urea and less oxygen.
 - D more urea and more oxygen.
- 19 The diagram shows part of the human skin.



What is the function of layer **P**?

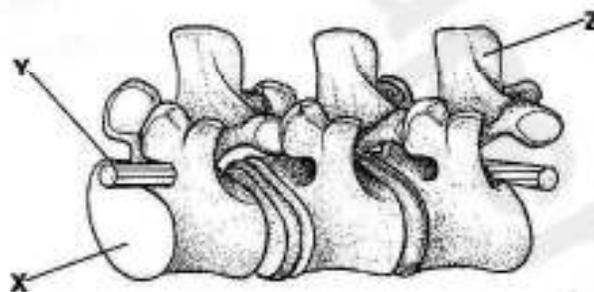
- A Insulation against the cold
 - B Manufacture of skin pigment
 - C Rapid cell division
 - D Reducing water loss
- 20 Which hormone is responsible for regulation of water in the human body?
- A Adrenaline
 - B Anti-diuretic hormone
 - C Glucagon
 - D Insulin

- 21 What are the physical effects of heroin?
- A Addiction occurs rapidly and rate of breathing increases.
 - B Causes anxiety and panic and increases sensitivity to pain.
 - C Reduces rate of breathing and causes anxiety and panic.
 - D Reduces sensitivity to pain and addiction occurs rapidly.
- 22 The diagram shows a section through the human eye.



What happens when muscle **P** contracts? The lens becomes ...

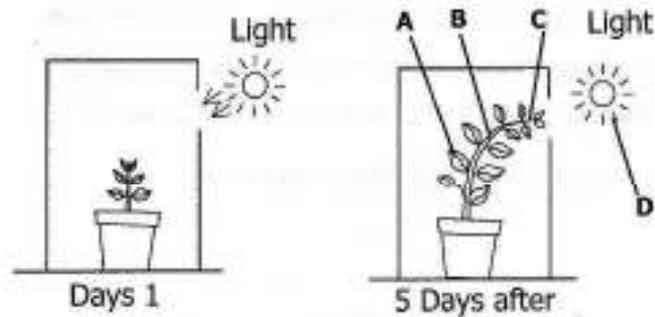
- A thicker to focus near objects.
 - B thicker to focus distant objects.
 - C thinner to focus distant objects.
 - D thinner to focus near objects.
- 23 The diagram shows part of a vertebral column.



What are the parts labelled **X**, **Y** and **Z**?

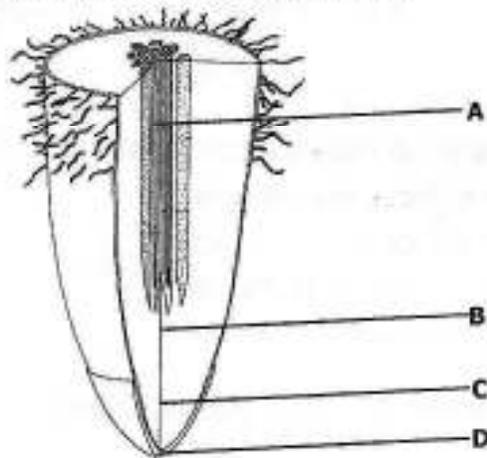
	Centrum	Neural spine	Spinal cord
A	X	Y	Z
B	X	Z	Y
C	Y	X	Z
D	Y	Z	X

- 24 The diagram shows two stages in the growth of a plant exposed to light from one side of a box.



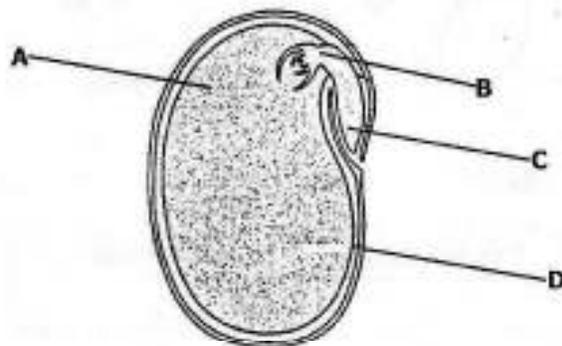
Which labelled part is the effector?

- 25 The diagram shows a longitudinal section through a root.



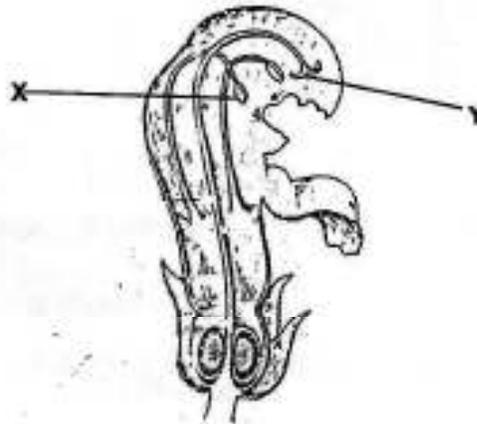
Which one is the region of cell division?

- 26 The diagram shows a longitudinal section of a seed.



Which labelled structure would show the greatest loss in dry mass during the first week of germination?

- 27 Which of the following is true regarding vegetative propagation?
- A Occurs naturally and artificially producing genetically identical plants.
 - B Occurs naturally and artificially producing genetically different plants.
 - C Occurs only artificially producing genetically similar plants.
 - D Occurs only naturally producing genetically similar plants.
- 28 The diagram shows a longitudinal section through a flower.



Which process occurs when pollen is transferred from X to Y?

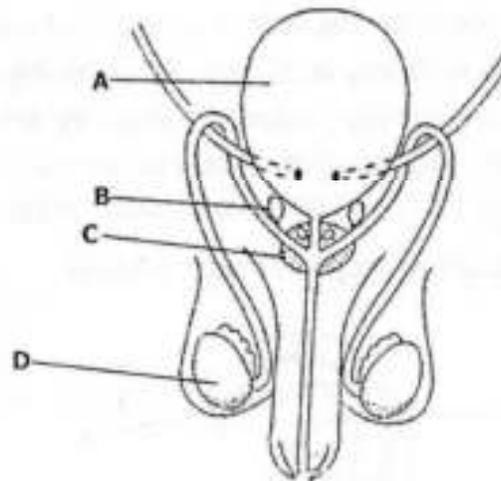
- A Dispersal
 - B Fertilisation
 - C Pollination
 - D Reproduction
- 29 The diagram shows the structure of a fruit in pea plants.



What method of dispersal is illustrated in the diagram?

- A Animal dispersal
- B Self dispersal
- C Water dispersal
- D Wind dispersal

30 The diagram shows the male reproductive system.

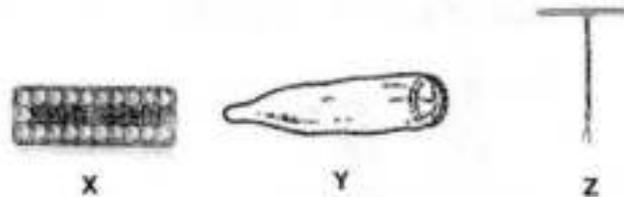


In which structure are hormones that bring about secondary sexual characteristics produced?

31 Which structure contracts when the baby is being born?

- A Cervix
- B Placenta
- C Umbilical cord
- D Uterus

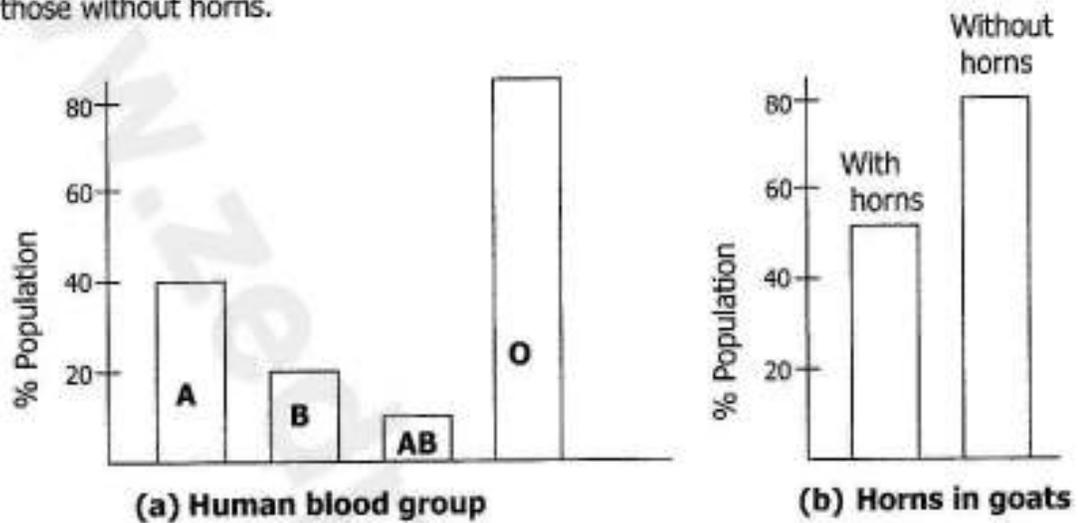
32 The diagrams represent different methods of birth control.



Which birth control method is represented by X, Y and Z?

	X	Y	Z
A	Hormonal	Mechanical	Mechanical
B	Hormonal	Mechanical	Surgical
C	Mechanical	Mechanical	Surgical
D	Mechanical	Surgical	Mechanical

- 33 The bar chart (a) shows the percentage of each blood group in a human population, while the bar chart (b) shows the percentage of goats with horns and those without horns.

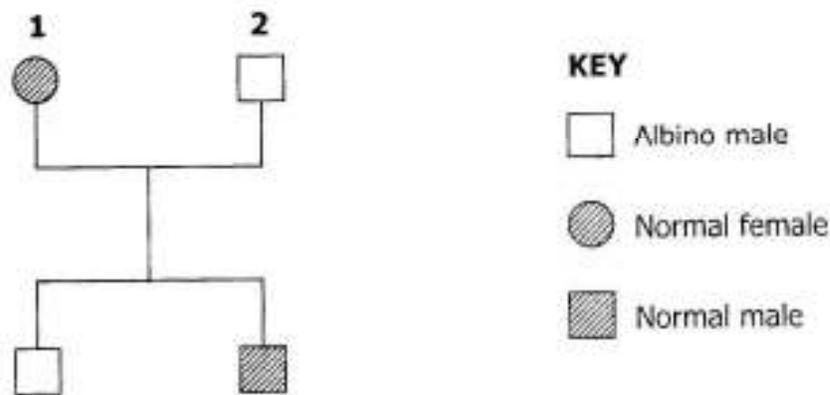


Which type of variation is shown in each population?

	Human blood groups	Horns in goat
A	Continuous	Continuous
B	Continuous	Discontinuous
C	Discontinuous	Continuous
D	Discontinuous	Discontinuous



- 34 The diagram shows the inheritance of albinism in a family. Albinism is caused by a recessive allele.



What are the genotypes of the parents **1** and **2**?

	1	2
A	Heterozygous	Heterozygous
B	Heterozygous	Homozygous dominant
C	Homozygous recessive	Heterozygous
D	Homozygous recessive	Homozygous recessive

- 35 The table shows some characteristics of four different vertebrates.

Which vertebrate is a reptile?

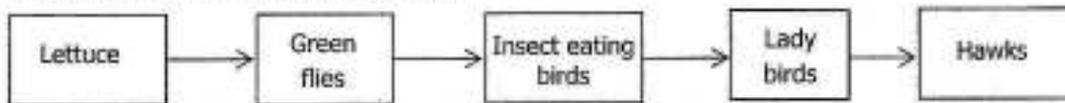
	Fins	Legs	Scales	Hair
A	✓	X	✓	X
B	X	✓	✓	X
C	X	✓	X	X
D	X	✓	X	✓

Key
 ✓ = Feature present
 X = Feature absent

- 36 Which soil component is important in giving soil a good crumb structure?

- A** Clay particles
- B** Humus
- C** Silt
- D** Sand particles

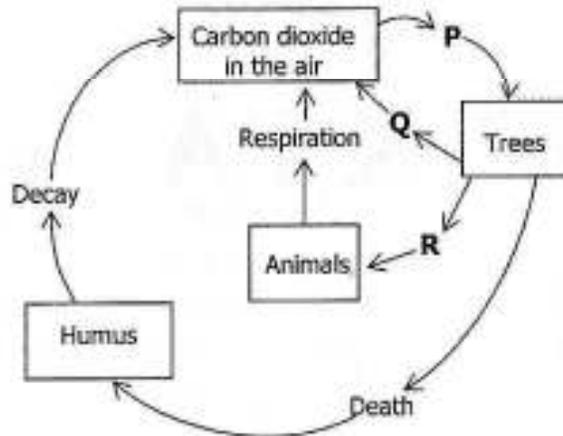
- 37 The diagram shows a food chain.



If the hawks are removed from this food chain, what is likely to happen to the number of the other organisms in this chain?

	Green flies	Insect eating birds	Lady birds
A	Decrease	Increase	Decrease
B	Decrease	Increase	Increase
C	Increase	Decrease	Decrease
D	Increase	Decrease	Increase

- 38 The diagram shows part of the carbon cycle in a forest. The letters **P**, **Q** and **R** represent different processes that occur during the carbon cycle.



Which of these processes are reduced in rate as a result of deforestation?

- A** P only.
B P and Q only.
C Q and R only.
D P, Q and R.
- 39 Which pollutants of water can lead to eutrophication?
A Fertilizers and herbicides.
B Fertilizers and sewage.
C Herbicides and insecticides.
D Insecticides and sewage.
- 40 What is the reason for conserving plant species?
A To absorb oxygen from the air.
B To decrease rainfall.
C To obtain drugs for medicinal use.
D To release carbon dioxide into the air.



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Candidate Name _____

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EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Biology Paper 2 Theory

5090/2

Wednesday

26 OCTOBER 2016

Additional Information:
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 Short answer questions [44 marks]

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

1 **Figure 1.1.** shows an animal cell as seen under an electron microscope.

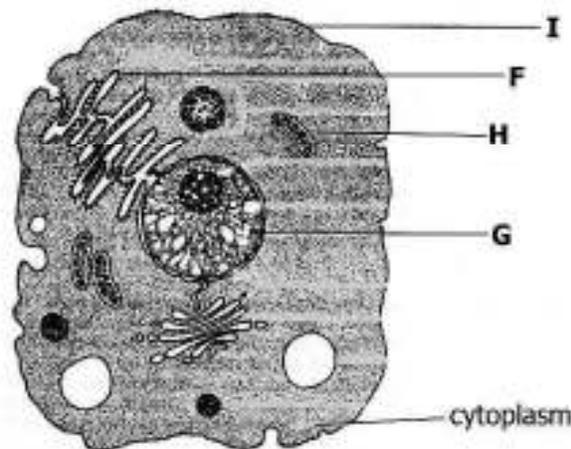


Figure 1.1

(a) Identify the labelled parts **F** and **G**.

Part **F**

Part **G** [2]

(b) Explain the functions of the parts labelled **H** and **I**.

H

.....

I

..... [4]

(c) Suggest **two** cell parts which would be present in **Figure 1.1** if it was a plant cell.

1.....

2..... [2]

Total 8 marks

2 **Figure 2.1.** shows the effect of pH on the rate of enzyme catalysed reactions **K** and **M**.

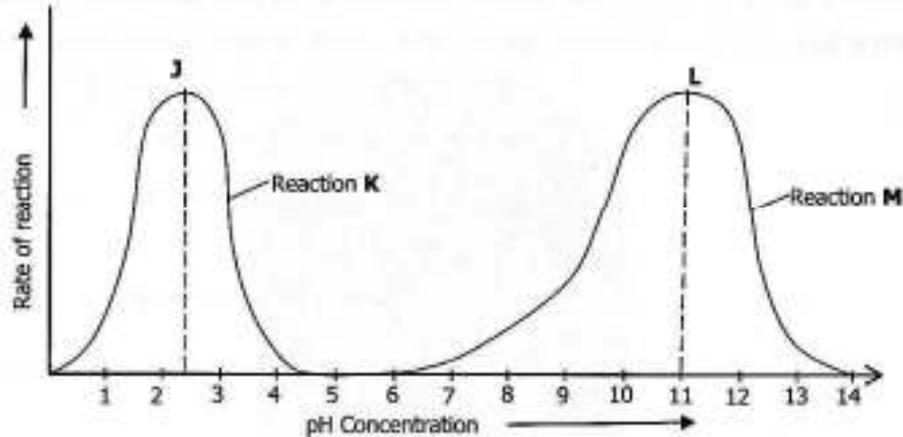


Figure 2.1

(a) What term is given to pH at **J** and **L**?

..... [1]

(b) Explain why the rate of reactions **K** and **M** goes down after point **J** and **L** respectively.

..... [2]

(c) Name the regions of the alimentary canal where reactions **K** and **M** take place?

K.....

M..... [2]

(d) (i) Suggest **one** enzyme which can catalyse reaction **M**.

..... [1]

(ii) State **one** food nutrient which can be catalysed in reaction **K**.

..... [1]

(e) State **two** factors other than pH which affect enzyme activity.

1.....

2..... [2]

Total 9 marks

- 3 **Figure 3.1.** shows a cross-section through a stem of a plant which had been previously dipped in a red dye for 6 hours.

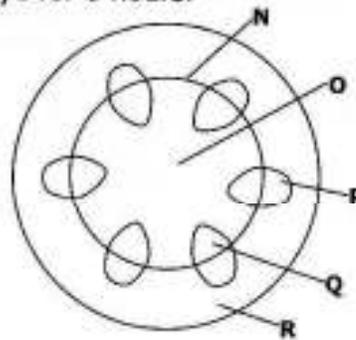


Figure 3.1

- (a) (i) Identify the parts labelled **N**, **P** and **Q**.
- N**
- P**
- Q** [3]
- (ii) Which labelled part in **Figure 3.1** would be stained red?
- [1]
- (iii) Give a reason for your answer in (a)(ii) above.
- [1]
- (b) (i) Suggest **three** factors that would increase the rate of movement of the dye in the stem when it is dipped in the red dye.
- [3]
- (ii) Name the process that will cause the movement of the red dye in the stem.
- [1]

Total 9 marks

4 **Figure 4.1.** shows a certain type of flower.

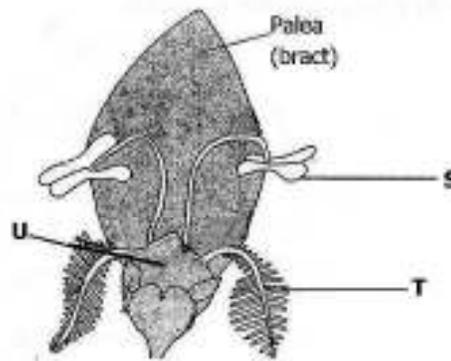


Figure 4.1

(a) Identify the parts labelled **S**, **T** and **U**.

S.....

T.....

U..... [3]

(b) (i) Identify the type of pollination that occurs in the flower in **Figure 4.1**.

..... [1]

(ii) Give **two** features from **Figure 4.1** which support your answer in (b)(i) above.

..... [2]

(c) (i) State **one** other type of pollination other than the one mentioned in (b)(i) above.

..... [1]

(ii) Give **two** characteristics of the flower where the type of pollination mentioned in (c)(i) above occurs.

1

.....

2

..... [2]

Total 9 marks

- 5 **Figure 5.1.** below shows pedigree diagrams for two families **A** and **B**, outlining inheritance of a sex-linked disease called haemophilia.

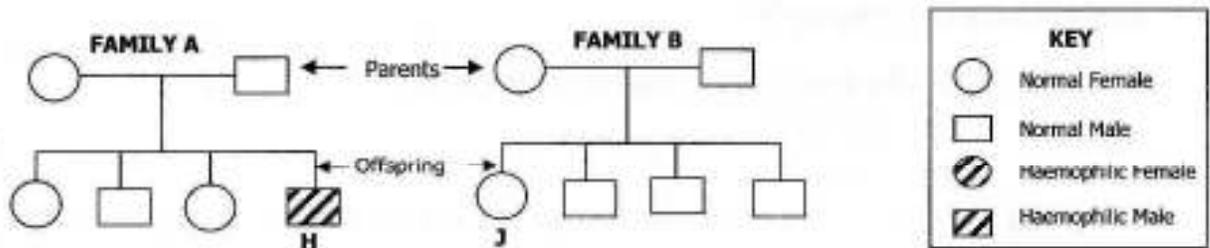


Figure 5.1

- (a) (i) From **Figure 5.1**, which family has a parent who is a carrier for haemophilia?

..... [1]

- (ii) Give a reason for your answer in (a)(i) above.

..... [1]

- (b) (i) Using the symbols X^H and X^h , state the genotypes for offspring **H** and **J**, if **J** is a carrier for haemophilia.

H

J [2]

- (ii) Using a genetic diagram, show whether the offspring would be haemophilic or normal when **H** and **J** are crossed.

Section B Essay questions[36 marks]

Answer any three questions from this section. All answers must be in complete sentences and paragraphs.

- 6** (a) Explain gaseous exchange in green plants during:
- (i) day time. [1]
- (ii) night time. [1]
- (b) Using **named** organisms, explain the industrial application of respiration. [4]
- (c) Describe how gum disease is brought about. [4]

Total 12 marks

- 7** (a) (i) Describe the structure and functions of endocrine glands. [3]
- (ii) Explain the difference between the adrenal gland and the salivary gland. [3]
- (b) Explain the function of the following hormones in the body:
- (i) Insulin [3]
- (ii) Antidiuretic hormone (ADH) [3]

Total 12 marks

- 8** (a) Explain how HIV can be transmitted from one person to another. [6]
- (b) (i) Explain the causes of stigma to people living with HIV and AIDS. [4]
- (ii) Describe ways of reducing stigma. [2]

Total 12 marks

- 9** (a) State the parts of a synovial joint and explain their functions. [6]
- (b) Explain why a bone is considered a living tissue. [3]
- (c) Explain the action of antagonistic muscles of the eye when one moves from a dark room into bright light. [3]

Total 12 marks

- 10** (a) Describe factors that make soil fertile. [4]
- (b) Explain the causes of loss of soil fertility. [4]
- (c) Explain methods of improving and retaining soil fertility. [4]

Total 12 marks



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Centre Number	Candidate Number										

Candidate Name _____

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Biology

5090/3

Paper 3 Practical Test

Additional Information:
As listed in Instructions to Supervisors

Time 1 hour 15 minutes

Instructions to Candidates

Write your name, centre number and candidate number in the spaces provided at the top of this page.

There are **two** questions in this paper.
Answer **both** questions.

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

Use sharp **HB** pencils for your drawings. Coloured pencils and crayons should not be used.

Information for candidates

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

Cell phones are not allowed in the examination room.

FOR EXAMINER'S USE	
1	
2	
Total	

Answer both questions

1 **E16** is an arrangement representing an ecosystem consisting of biotic and abiotic factors.

(a) Name any **two** biotic components in **E16** and state their roles.

(i) 1. Name: [1]

2. Role: [1]

(ii) 1. Name: [1]

2. Role: [1]

(iii) State any **two** abiotic components you can see in **E16**.

1. [1]

2. [1]

(b) (i) Describe the importance of having a variety of living things in **E16**.

..... [1]

(ii) What would happen if the biotic components were removed from **E16**?

..... [2]

(c) (i) Using organisms in **E16**, construct a food chain to illustrate feeding relationships that exist within an ecosystem.

[3]

- (ii) Classify each organism in the food chain in (c) (i) above according to their trophic levels.

.....
.....
.....

[3]

- (iii) Name any **two** physical factors in E16 which are not directly observable but influence the activities of the setup in E16.

.....
.....

[2]

- (iv) State any **three** economic reasons for maintaining biodiversity in the ecosystem.

1.
2.
3.

[3]

Total 20 marks

SPECIMEN

2 You are provided with specimens **W70** and **W71**. Specimen **W70** is homozygous tall and **W71** is homozygous short. Tallness is controlled by a dominant gene (**T**) while shortness is controlled by a recessive gene (**t**).

(a) A monohybrid cross was carried out between **W70** and **W71**.

(i) State the phenotype of

1. **W70** [1]

2. **W71** [1]

(ii) Determine the genotype of the F_1 generation.

..... [1]

(iii) Determine the phenotype of the F_1 generation.

..... [1]

(b) The F_1 offspring were allowed to inbreed.

(i) Determine the phenotype of the F_2 generation.

..... [2]

(ii) Determine the genotype of the F_2 generation.

..... [3]

(iii) Determine the phenotypic ratio of the F_2 generation.

..... [1]

(c) You are provided with two dwarf plants labeled as specimens **C** and **D**. Dwarfness is controlled by a recessive gene, **t**.

(i) State the genotype of the parent plant **C**.

..... [1]

(ii) Determine the phenotype of the F_1 generation formed from a cross between **C** and **D**.

..... [1]

- (iii) Illustrate using a genetic diagram how the F_1 offspring in (c)(ii) above are formed.

[7]

- (iv) State **one** disadvantage of the type of breeding shown by **C** and **D**.

[1]

Total 20 marks

SPECIMEN

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EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

Biology

5090/1

Paper 1 Multiple Choice

Tuesday

25 JULY 2017

Additional Materials:

- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

Time 50 minutes

Instructions to Candidates

Do not open this Question Paper until you are told to do so.

Write your **name**, **centre number** and **candidate number** on the Answer Sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer all questions. For each question there are four possible answers: **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read very carefully the instructions on the Answer Sheet.

Information for Candidates

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this Question Paper.

Cell phones are not allowed in the examination room.

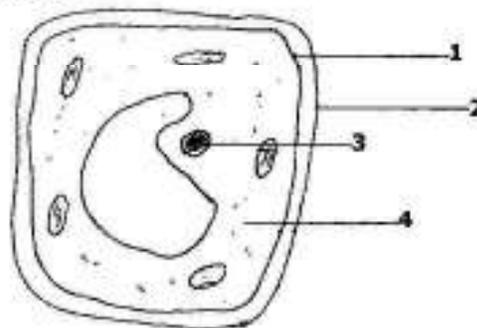
- 1** The diagram shows a guava leaf with a magnification of x2.0.



If the length of the drawing is 8.0 cm, what is the length of the actual leaf?

- A** 4.0 cm
- B** 7.5 cm
- C** 8.5 cm
- D** 16.0 cm

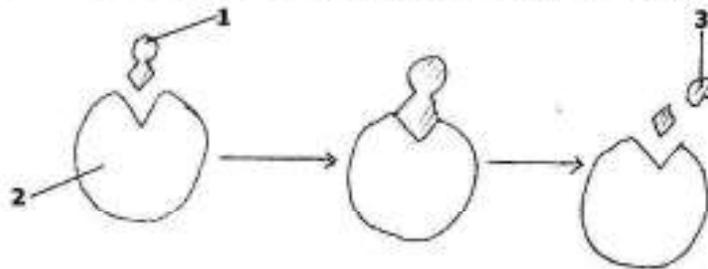
- 2** The diagram shows a plant cell.



Which two structures in this cell are not present in a red blood cell?

- A** 1 and 2
 - B** 2 and 3
 - C** 3 and 4
 - D** 2 and 4
- 3** What term is used to refer to a solution outside a cell whose concentration is lower than the concentration of a solution inside the living cell?
- A** Equilibrium
 - B** Hypertonic
 - C** Hypotonic
 - D** Isotonic

- 4 The diagram shows the lock and key model of enzyme action.



Which number in the diagram represents the enzyme and the substrate?

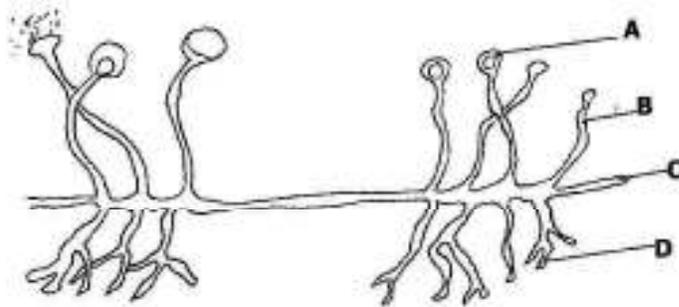
	Enzyme	Substrate
A	1	2
B	1	3
C	2	1
D	3	2

- 5 Which of the following correctly shows the deficiency diseases caused by lack of vitamin C, proteins and iron in the body?

	Vitamin C	Protein	Iron
A	Anaemia	Rickets	Scurvy
B	Kwashiorkor	Anaemia	Rickets
C	Rickets	Scurvy	Kwashiorkor
D	Scurvy	Kwashiorkor	Anaemia

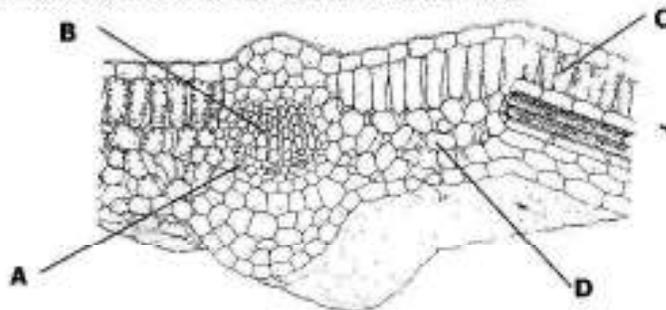
- 6 Which nutrient in the diet should be increased to keep a patient healthy after suffering from malaria for a long time?
- A Calcium
 B fat
 C Iron
 D Vitamin D
- 7 In plants, magnesium is an essential element for formation of ...
- A chlorophyll.
 B flowers.
 C proteins.
 D roots.

- 8 The diagram shows the structure of Rhizopus.



Which labelled part releases digestive enzymes?

- 9 The diagram shows the internal structure of a leaf.

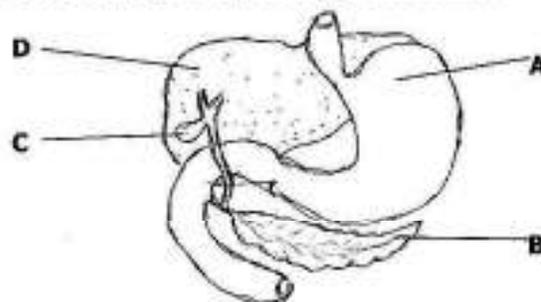


Which part transports food nutrients?

- 10 An organism has the following number of teeth in the mouth. Incisors – 4, canines – 8, premolars – 10 and molars – 12.
What is the dental formula of the organism?

- A $i:\frac{2}{2}, c:\frac{4}{4}, pm:\frac{5}{5}, m:\frac{6}{6}$
 B $i:\frac{1}{3}, c:\frac{3}{5}, pm:\frac{3}{7}, m:\frac{5}{7}$
 C $i:\frac{2}{3}, c:\frac{1}{4}, pm:\frac{5}{5}, m:\frac{7}{5}$
 D $i:\frac{1}{1}, c:\frac{2}{2}, pm:\frac{2}{3}, m:\frac{3}{3}$

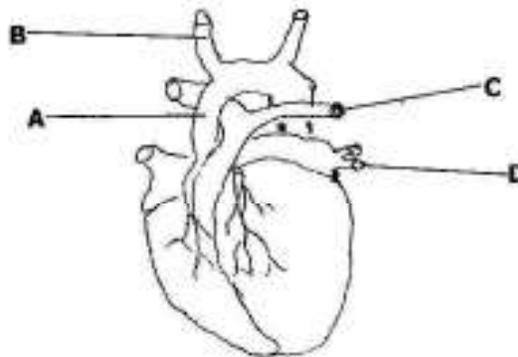
- 11 The diagram below shows part of the digestive tract.



Which structure produces an alkaline juice needed in digestion?

- 12 What changes cause expiration (breathing out) to take place?
- | | Diaphragm muscle | Internal intercostal muscle | Volume of thorax |
|----------|-------------------------|------------------------------------|-------------------------|
| A | Contracts | Relaxes | Increases |
| B | Contracts | Contracts | Decreases |
| C | Relaxes | Relaxes | Increases |
| D | Relaxes | Contracts | decreases |
- 13 Which of the following can help to reduce the causes of stigma to people living with HIV and AIDS?
- A** Fear
B Myths
C Counselling and testing
D Sensitization
- 14 What type of immunity do babies obtain from the mother through breast milk?
- A** Artificial active immunity.
B Artificial passive immunity.
C Natural active immunity.
D Natural passive immunity.
- 15 In an experiment to compare water loss, four similar leaves were treated with petroleum jelly (Vaseline) and left on a table for one hour.
- Leaf 1** Upper surface only covered.
Leaf 2 Lower surface only covered.
Leaf 3 Both surfaces covered.
Leaf 4 Neither surface covered.
- Which of the leaves will wilt the slowest?
- A** Leaf 1
B Leaf 2
C Leaf 3
D Leaf 4
- 16 Which vitamin is essential for clotting of blood?
- A** Vitamin A
B Vitamin B
C Vitamin C
D Vitamin K

- 17 The diagram shows the external view of the heart.



Which blood vessel is the pulmonary vein?

- 18 Which substance cannot diffuse out of the blood into the dialysis fluid through the dialysis membrane in a kidney machine?

- A Glucose
- B Protein
- C Sodium
- D Urea

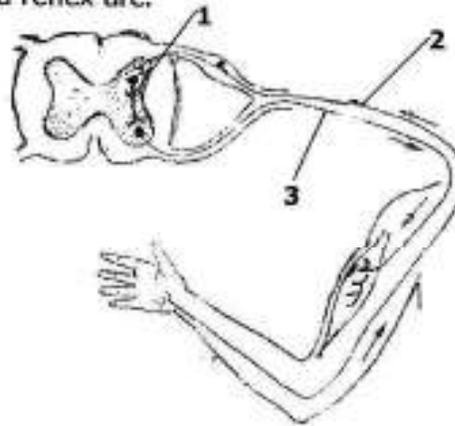
- 19 A person is digging on a hot day without drinking any water. What effect will this have on the release of antidiuretic hormone (ADH) and the reabsorption of water in the body?

	Release of ADH	Reabsorption of water
A	Decreases	Decreases
B	Decreases	Increases
C	Increases	Decreases
D	Increases	Increases

- 20 Which of the following is one of the effects of over production of thyroxine?

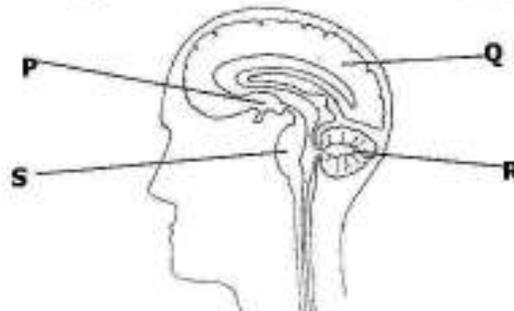
- A Cretinism
- B Giantism
- C Hyperactivity
- D Myxoedema

- 21 The diagram shows a reflex arc.



What are the numbered neurones called?

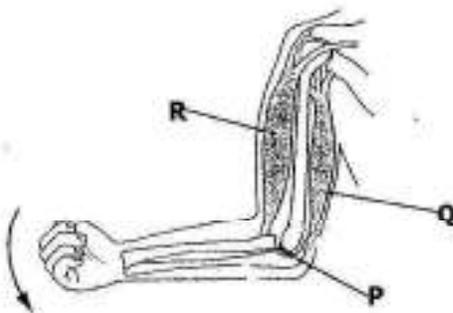
- | | 1 | 2 | 3 |
|----------|----------|----------|----------|
| A | Relay | Sensory | Motor |
| B | Relay | Motor | Sensory |
| C | Motor | Sensory | Relay |
| D | Motor | Relay | Sensory |
- 22 The diagram shows a longitudinal section of the human brain.



Which of the labelled part is responsible for controlling heart rate, reasoning and temperature?

- | | Heart rate | Reasoning | Temperature |
|----------|-------------------|------------------|--------------------|
| A | P | Q | S |
| B | Q | R | P |
| C | R | S | Q |
| D | S | Q | P |

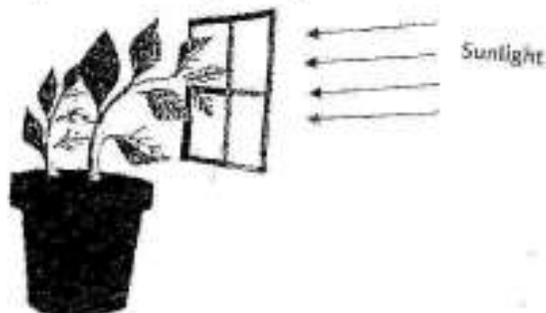
23 The diagram shows bones and muscles of the forelimb.



Which of the following correctly identifies joint **P** and what happens to muscle **Q** and **R** when the arm is straightened?

	Joint P	Muscle Q	Muscle R
A	Ball and socket	Contract	Relax
B	Ball and socket	Relax	Contract
C	Hinge	Contract	Relax
D	Hinge	Relax	Contract

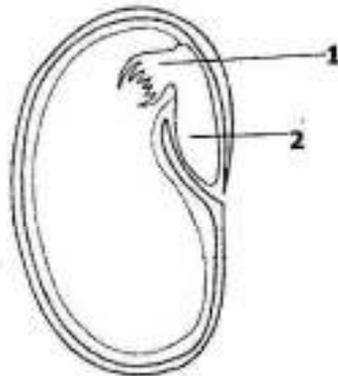
24 The diagram shows plant shoots growing towards a stimulus.



What type of tropic response is illustrated in the diagram?

- A** Positive geotropism
- B** Positive phototropism
- C** Negative phototropism
- D** Negative geotropism

- 25 The diagram shows a longitudinal section of a seed.



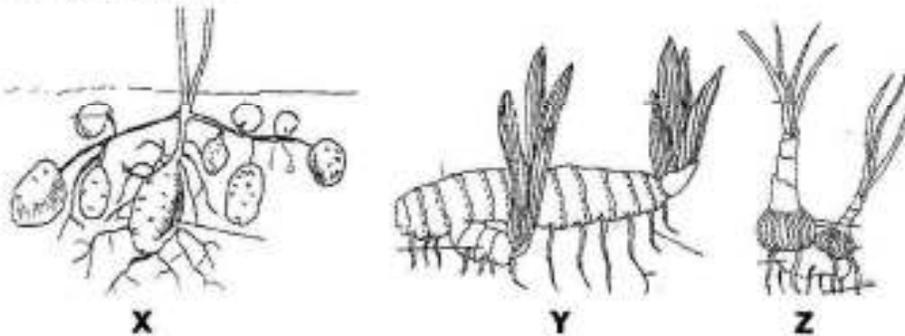
What are the numbered parts?

	1	2
A	Cotyledon	Plumule
B	Plumule	Radicle
C	Radicle	Plumule
D	Plumule	Cotyledon

- 26 What type of asexual reproduction occurs in Rhizopus?

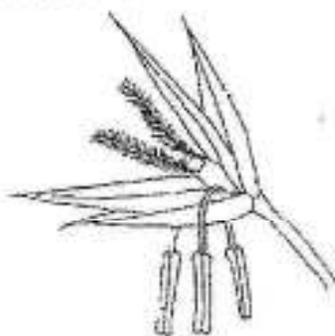
- A Binary fission
- B Budding
- C Fragmentation
- D Spore formation

- 27 Identify the type of natural vegetative reproduction illustrated by each of the following diagrams.



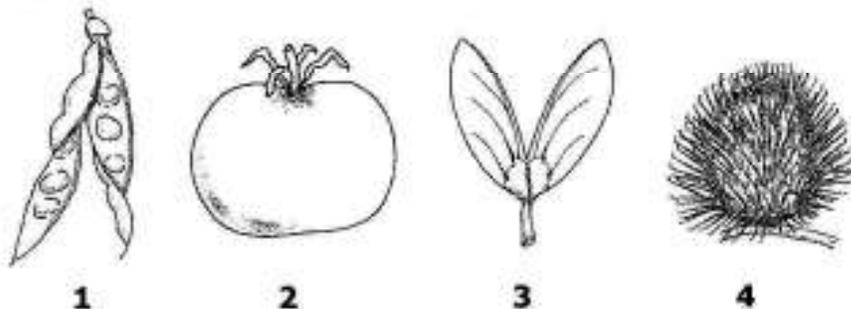
	X	Y	Z
A	Tuber	Bulb	Rhizome
B	Tuber	Rhizome	Bulb
C	Rhizome	Tuber	Bulb
D	Tuber	Bulb	Stolon

28 Which feature in the flower below shows that it is wind pollinated?



- A Lobed stigma
- B Long filaments
- C Presence of petals
- D Short filaments

29 The diagram shows four different fruits.

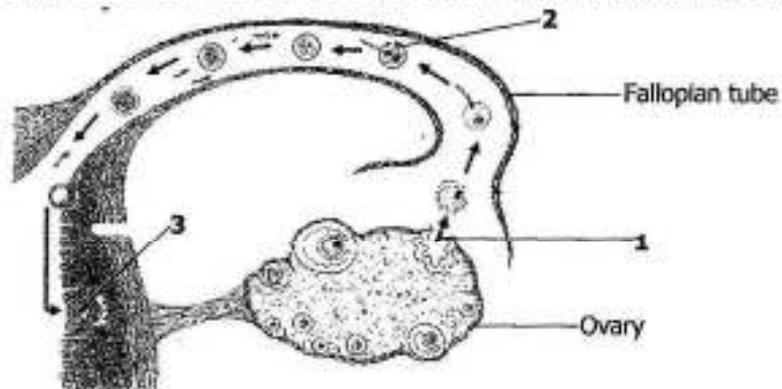


Which **two** fruits are dispersed by animals?

- A 1 and 2
 - B 1 and 3
 - C 2 and 4
 - D 3 and 4
- 30 Which of the following correctly states the functions of the cowper's gland, prostate gland and seminal vesicle in a male reproductive system?

	Cowper's gland	Prostate gland	Seminal vesicle
A	Provides lubrication	Activates sperms	Provides nutrients to the sperms
B	Provides lubrication	Provides nutrients to the sperms	Activates sperms
C	Provides nutrients to the sperms	Provides lubrication	Activates sperms
D	Provides nutrients to the sperms	Activates sperms	Produces lubrication

- 31 The diagram shows part of a human female reproductive system after copulation.

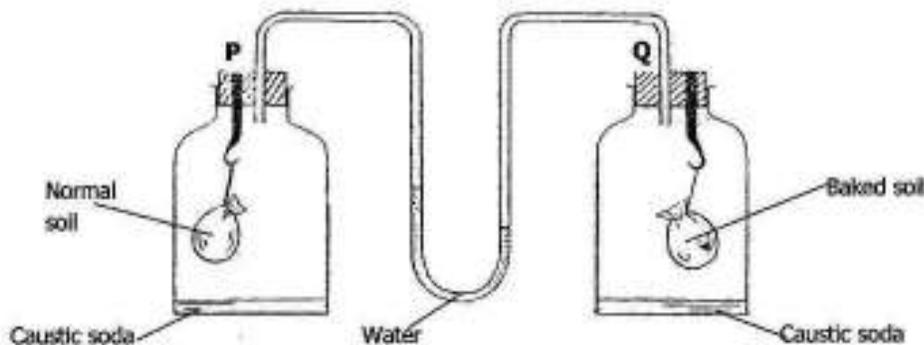


What processes are taking place at points 1, 2 and 3?

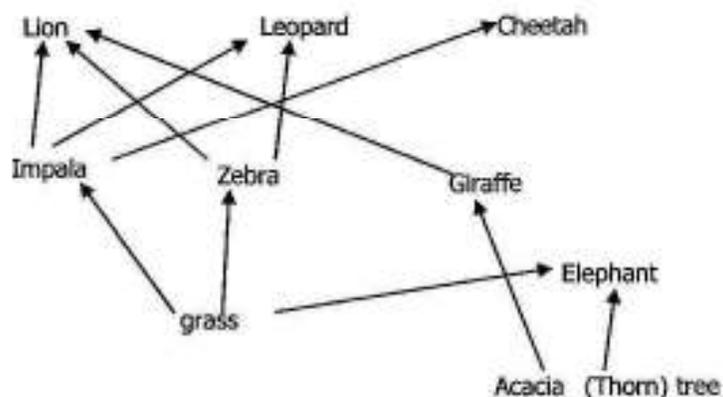
	1	2	3
A	Fertilisation	Implantation	Ovulation
B	Fertilisation	Ovulation	Implantation
C	Ovulation	Fertilisation	Implantation
D	Ovulation	Implantation	Fertilisation

- 32 Vasectomy is one of the methods of preventing pregnancy.
Which structure in the male reproductive system is cut during vasectomy?
- A Epididymis
B Prostate gland
C Sperm duct
D Urethra
- 33 Which statement correctly describes events which take place during interphase of mitosis?
- A Chromosomes start to coil, become shorter and thicker.
B Chromosomes line up on the equator of the spindle.
C Chromatids are pulled apart by spindle fibres.
D Chromosomes are replicated ready for the next division.
- 34 In horses, red hair is dominant over brown hair. A breeder crosses a number of heterozygous red-haired horses.
What percentage of the offspring will be red-haired?
- A 25%
B 50%
C 75%
D 100%

- 35 Which of the following diseases is caused by chromosomal mutation?
- A Colour blindness
 - B Down's syndrome
 - C Haemaphilia
 - D Sickle cell anaemia
- 36 The diagram shows an experimental set up to investigate one of the components of soil. The water level in the U-shaped tube moves up towards P.



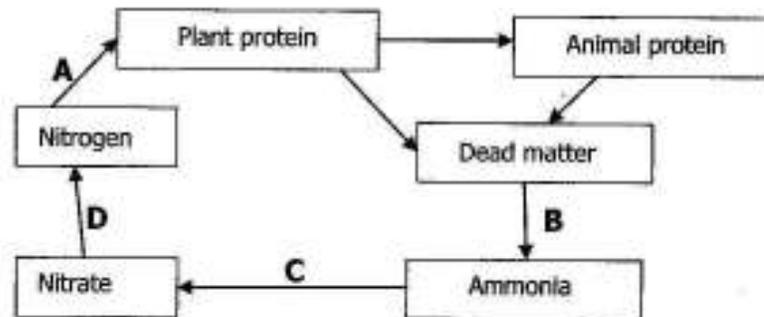
- What component of soil is being investigated in the experiment above?
- A Air
 - B Humus
 - C Micro-organisms
 - D Moisture
- 37 The diagram shows feeding relationships of organisms in an ecosystem.



Which organisms in the food web are herbivores?

- A Impala, Zebra, Giraffe, Elephant
- B Impala, Zebra, Giraffe, Leopard
- C Zebra, Giraffe, Leopard, Cheetah
- D Zebra, Lion, Leopard, Cheetah

- 38 The diagram shows part of the nitrogen cycle.



At which point are nitrifying bacteria involved?

- 39 What changes in the concentration of oxygen, number of fish and number of bacteria would occur when sewage is discharged into a river?

	Concentration of oxygen	Number of bacteria	Number of fish
A	Decreases	Decreases	Increases
B	Decreases	Increases	Decreases
C	Increases	Decreases	Decreases
D	Increases	Increases	Increases

- 40 Which of the following human activities help increase bio-diversity of organisms?
- A** Afforestation
 - B** Charcoal production
 - C** Fishing
 - D** Hunting



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EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

Biology
Paper 1 Multiple Choice

5090/1

Wednesday

6 JULY 2016

Additional materials:

- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

Time: 50 minutes

Instructions to candidates

Do not open this Question Paper until you are told to do so.

Write your name, centre number and candidate number on the Answer Sheet in the spaces provided unless this has already been done for you.

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Information for candidates

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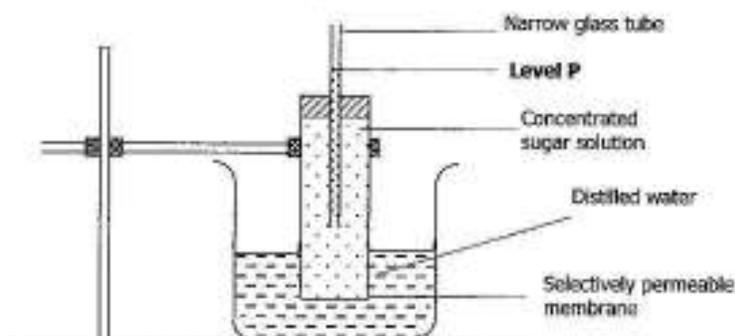
1 Which characteristic of living organisms is described by the following statement?
 "Permanent increase in size of an organism".

- A Excretion
- B Growth
- C Reproduction
- D Respiration

2 What are the correct functions of the following specialised cells?

	Root hair cell	Phloem cells	Xylem cells
A	Absorption of water	Conduction of sucrose	Conduction of water
B	Absorption of water	Conduction of water	Conduction of sucrose
C	Conduction of water	Conduction of sucrose	Absorption of water
D	Conduction of water	Absorption of water	Conduction of sucrose

3 The diagram shows an apparatus used to investigate osmosis.



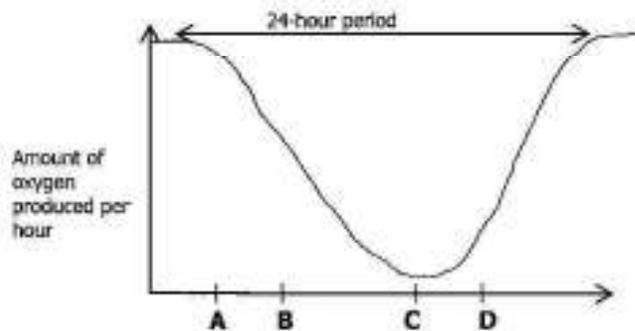
What molecules will pass through the selectively permeable membrane and what will happen to level P?

	Molecules that pass through selectively permeable membrane	Level P
A	Sugar	Fall
B	Sugar	Rise
C	Water	Fall
D	Water	Rise

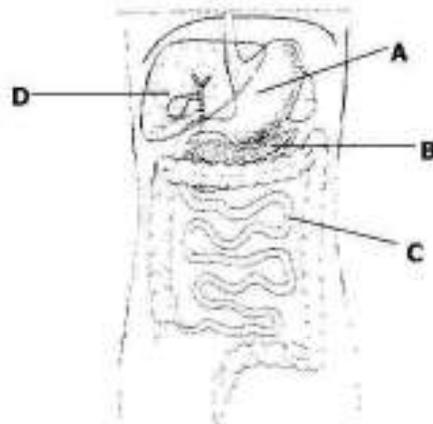
- 4 In the phylum arthropoda, which of the following characteristics correctly identifies the class insecta?

	Number of main body parts	Pairs of legs	Pairs of wings
A	2	3	2
B	3	2	4
C	3	3	2
D	4	6	4

- 5 Which of the following signs indicate that a plant is lacking magnesium?
- A** Purple leaves and thin stem.
B Small leaves and thin stem.
C White upper leaves and normal leaves.
D Yellow leaves and yellow stems.
- 6 The diagram shows the amount of oxygen produced by a green plant, growing outdoors, during a 24-hour period. Which letter represents midday?

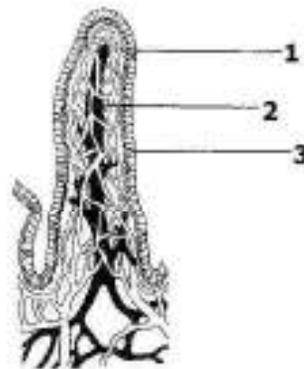


- 7 Which substances are needed for formation of healthy bones and teeth?
- A** Calcium and Vitamin C.
B Calcium and Vitamin D.
C Iron and Vitamin C.
D Iron and Vitamin D.
- 8 The diagram shows the alimentary canal.



Which labelled structure produces an acidic digestive juice?

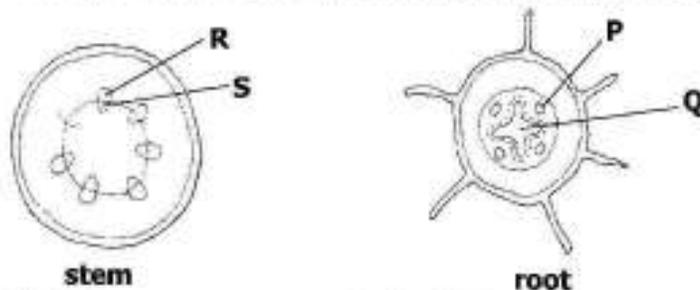
- 9 The diagram shows a villus.



Which of the following correctly describes the functions of the numbered parts?

	1	2	3
A	Absorbs digested fats	Absorbs glucose	Produces enzymes
B	Absorbs digested fats	Absorbs glucose	Produces mucus
C	Absorbs glucose	Produces digested fats	Produces enzymes
D	Absorbs glucose	Absorbs digested fats	Produces mucus

- 10 The diagrams show the transverse section of a dicot root and a dicot stem.



Which tissues carry sucrose in solution?

	Root	Stem
A	P	R
B	P	S
C	Q	R
D	Q	S

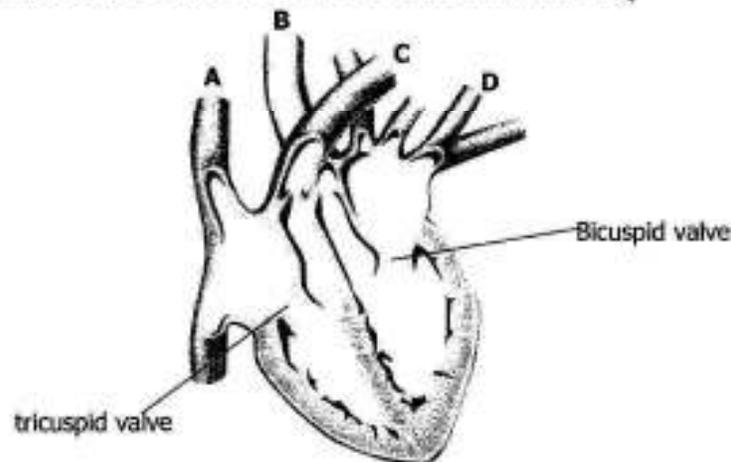
- 11 Which conditions will increase the rate of transpiration in a plant?

	Temperature	Humidity	Wind speed
A	High	High	High
B	High	Low	High
C	Low	High	High
D	Low	Low	High

- 12 A woman has fewer red blood cells than normal. What would be the effect of this?

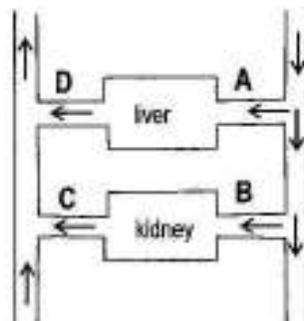
- A Her blood contains high levels of urea.
 B Her blood does not clot properly.
 C Her body does not get enough oxygen.
 D She cannot fight off infections.

- 13 The diagram shows a transverse section of the human heart,



Which labelled vessel is the vein that carries oxygenated blood?

- 14 The diagram represents the liver, Kidney and some associated blood vessels. In which blood vessel will the blood contain the lowest concentration of urea?



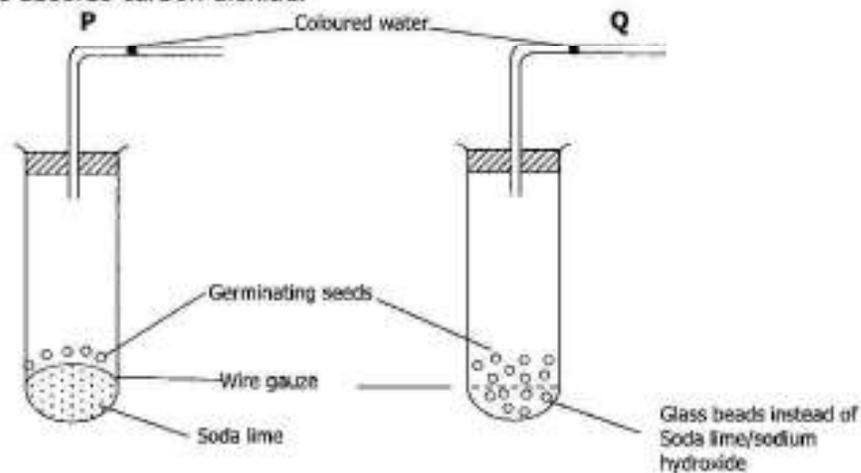
15 The end products of anaerobic respiration in yeast cells are ...

- A carbon dioxide and ethanol.
- B carbon dioxide and lactic acid.
- C carbon dioxide and water.
- D ethanol and water.

16 What happens to the diaphragm and external intercostal muscles during inspiration?

	Diaphragm	External intercostal muscles
A	Contract	Contract
B	Contract	Relax
C	Relax	Contract
D	Relax	Relax

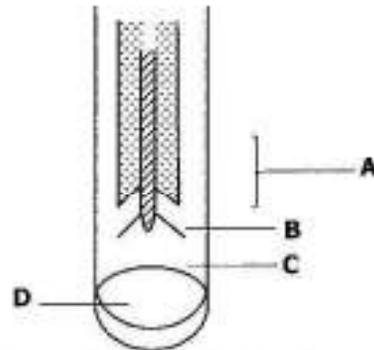
17 The diagram shows an experiment to investigate respiration in germinating seeds. Soda lime absorbs carbon dioxide.



In which direction does the coloured water move?

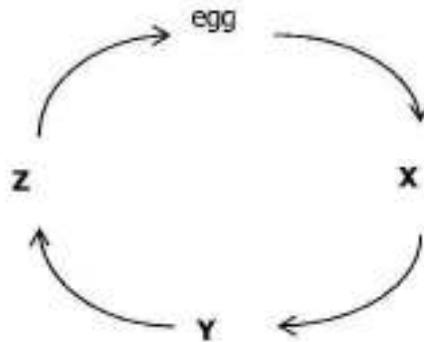
	P	Q
A	Left	Right
B	Left	Stay still
C	Right	Left
D	Stay still	Right

- 18 The diagram shows a root meristem.



Which part is the region of cell division?

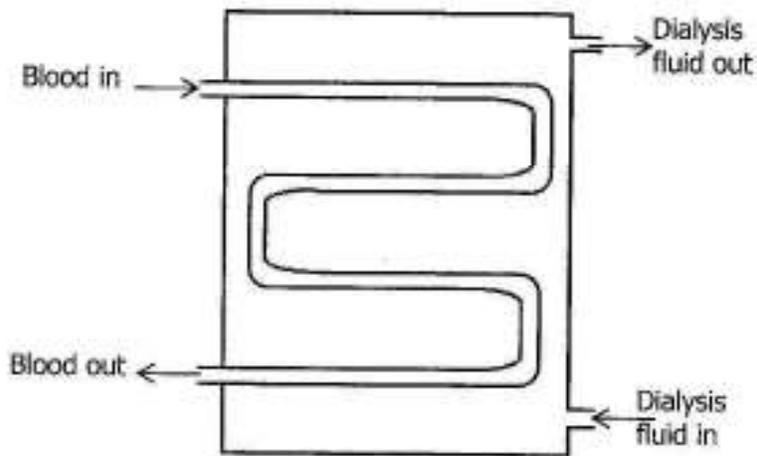
- 19 The diagram shows the life cycle of a mosquito.



What stages are X, Y and Z?

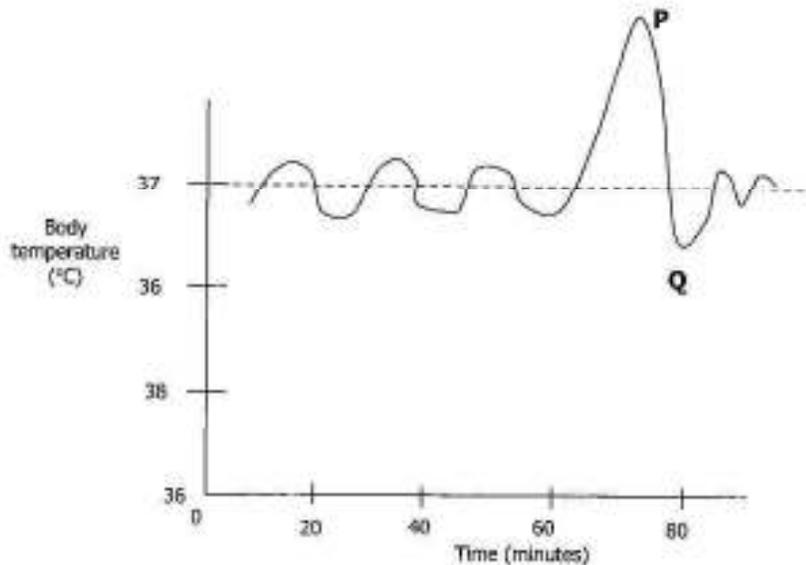
	X	Y	Z
A	Adult	Pupa	Larva
B	Adult	Larva	Pupa
C	Larva	Adult	Pupa
D	Larva	Pupa	Adult

- 20 The diagram shows part of a dialysis machine.



Which substance in the dialysis fluid should be at a lower concentration than in the blood?

- A Amino acids and glucose.
 - B Amino acids and urea.
 - C Glucose and salts.
 - D Salts and urea.
- 21 The graph shows changes in the person's body temperature plotted against time. What causes the change in temperature between P and Q?



- A Increase in temperature.
- B Increase in evaporation of water in sweat.
- C Reduced blood flow through surface capillaries.
- D Shivering.

- 22 What effect would an increase in glucagon have on the human body?

	Concentration of glycogen in the liver	Concentration of glucose in the blood
A	Decrease	Increase
B	Increase	Increase
C	No effect	Decrease
D	Increase	No effect

- 23 Which of the following correctly distinguishes a taxic response from a tropic response? The taxic response ...

- A** involves hormones.
- B** is a growth movement.
- C** is movement of whole organism.
- D** is irreversible.

- 24 Which part of the brain is responsible for osmoregulation?

- A** Cerebellum
- B** Cerebrum
- C** Hypothalamus
- D** Medulla oblongata

- 25 Which substances are depressant drugs?

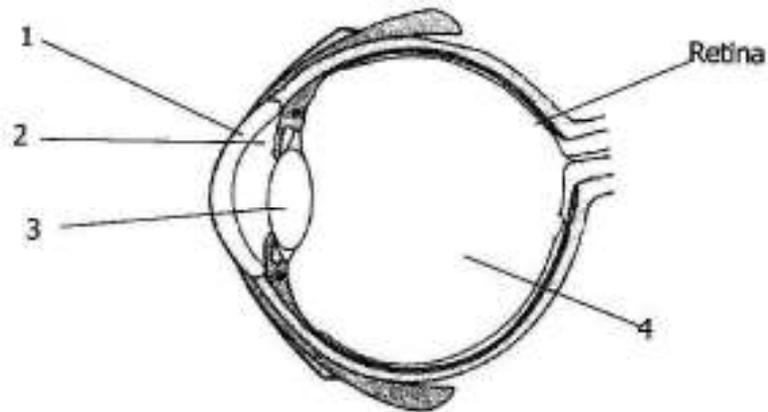
	Alcohol	Heroin	Nicotine
A	✓	✓	✓
B	✓	✓	X
C	✓	X	✓
D	X	✓	✓

Key

✓ depressant drug

X not a depressant drug

- 26 The diagram shows a section through the eye.



Which pair of structures focus light rays onto the retina?

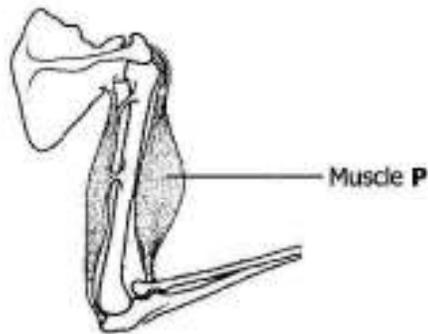
- A 1 and 2.
 - B 1 and 3.
 - C 2 and 3.
 - D 2 and 4.
- 27 The diagram shows a bone from a fore limb.



What is the name of the bone and which type of joint does it form at P?

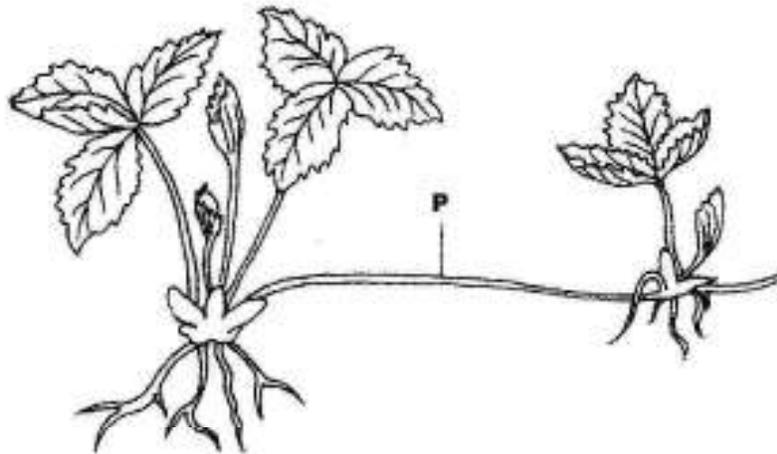
	Bone	Joint
A	Humerus	Hinge
B	Humerus	Ball and socket
C	Ulna	Hinge
D	Ulna	Ball and socket

- 28 The diagram shows the main bones and muscles of the arm.



What happens when muscle **P** contracts?

- A The lower arm is extended.
 - B The lower arm is raised.
 - C The upper arm is raised.
 - D The whole arm rotates.
- 29 The diagram below shows a form of asexual reproduction.



What name is given to the vegetative structure labelled **P**?

- A Corm
- B Rhizome
- C Runner
- D Sucker

30 In plant reproduction, the following processes occur:

- 1 Fertilization
- 2 Growth of a pollen tube
- 3 Pollination
- 4 Seed germination

In which order do these processes occur?

- A 1 → 4 → 2 → 3
 B 2 → 1 → 3 → 4
 C 3 → 2 → 1 → 4
 D 4 → 3 → 1 → 2

31 A woman ovulates on the 7th of January. In which week will her next menstrual period begin?

January						
Mon	Tue	Wed	Thurs	Fri	Sat	Sun
-	-	-	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	-

- A
 B
 C
 D

32 Which **one** of the following statements describes the effects of smoking on the baby in a pregnant mother?

- A Increased growth rate and increased birth weight.
 B Increased growth rate and reduced birth weight.
 C Reduced growth rate and increased birth weight.
 D Reduced growth rate and reduced birth weight.

33 Which of the following parasites requires a fresh water snail to complete its life cycle?

- A Plasmodium
 B Schistosoma
 C Trypanosoma
 D Vibrio cholerae

34 Which **one** of the following is the most effective way of avoiding HIV infection by someone who is not infected?

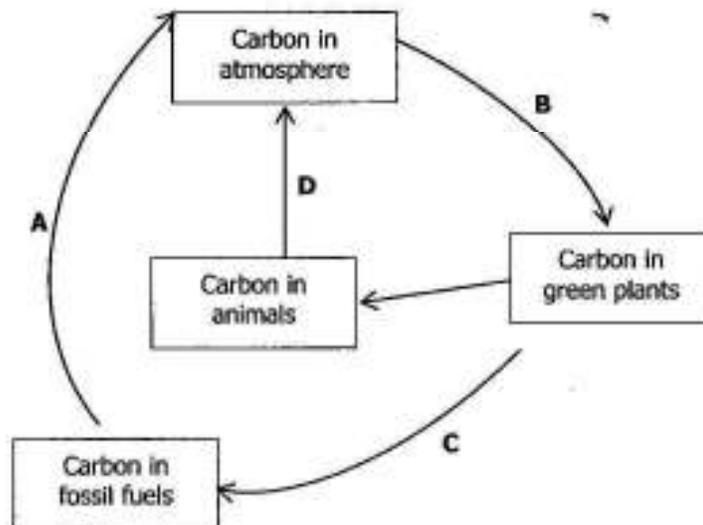
- A Avoiding sexual intercourse.
 B Having one sexual partner.
 C Using condoms during sexual intercourse.
 D Using spermicides during sexual intercourse.

- 35 The diagram below shows a simple version of the energy flow through a food chain.



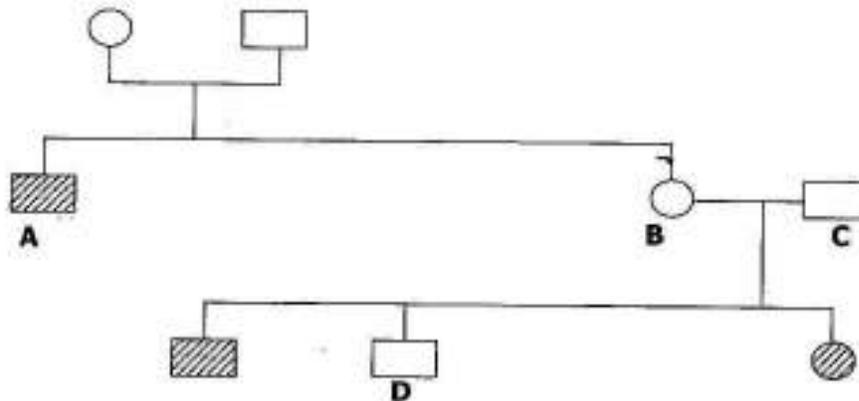
What happens to the energy leaving the decomposers?

- A Adds to soil fertility.
 - B Lost as heat.
 - C Lost in undigested food (faeces).
 - D Returns to the sun.
- 36 The diagram shows a part of the carbon cycle. Which letter represents fossilisation?



- 37 Which of the following is an effect of deforestation?
- A Decreased carbon dioxide content in the air.
 - B Decreased flooding of low lying land.
 - C Increased rainfall.
 - D Increased rate of soil erosion.
- 38 An insect has 42 chromosomes in each of its muscle cells.
How many chromosomes are there in its egg cells?
- A 42
 - B 30
 - C 25
 - D 21

- 39 If the allele for round seeds is dominant to the allele for wrinkled seeds, how many wrinkled seeds can be obtained in a cross of 200 heterozygous plants to yield 1500 round seeds?
- A 6000
B 2000
C 1500
D 500
- 40 The diagram shows a family pedigree in which some members have sickle cell anaemia.



Which person could have two alleles for sickle cell anaemia?

Key

-  Male with sickle cell anaemia
 Female with sickle cell anaemia
 Normal male
 Normal female



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Preamble for Biology (5090)

The Examinations Council of Zambia has made adjustments to the assessment of **Biology** at Grade 12 level so as to be in line with the revised **Biology** Senior Secondary School Syllabus of 2013 developed by Curriculum Development Centre (CDC) of the Ministry of General Education.

Purpose

The purpose of the Biology assessment will be to evaluate candidates' competences in terms of scientific knowledge, skills and values about the living world, to certify, to place candidates into tertiary institutions and to evaluate acquisition of skills useful to candidates in their daily lives.

Assessment Objectives (AO)

Assessment in Biology will be done under three main Assessment Objectives (AO1, AO2 and AO3), as shown below.

Knowledge with Understanding

1. state biological phenomena, facts, laws
2. definitions, concepts, theories
3. understand and use biological vocabulary, terminology and conventions correctly (including symbols, quantities and units)
4. demonstrate knowledge of scientific instruments and apparatus, including techniques of operation and aspects of safety
5. state and determine scientific quantities
6. demonstrate knowledge of biological and technological applications with their social, economic and environmental implications.

Handling Information and Problems Solving

1. locate, select, organise and present information from a variety of sources
2. translate information from one form to another
3. manipulate numerical and other data
4. identify patterns, report trends and conclude
5. explain phenomena, patterns and scientific relationships
6. make predictions and propose hypotheses
7. solve problems using biological principles.

Experimental and Investigative Skills

1. follow a sequence of instructions
2. use techniques, apparatus, measuring devices and materials effectively, accurately and safely
3. make and record observations, measurements, calculations and estimates with due regard to precision, accuracy and correct units

4. make accurate scientific drawings with due regard to appropriateness and proper labelling
5. interpret, evaluate and report upon observations and experimental data
6. identify problems, design/plan and carry out investigations, including the selection of techniques, apparatus, measure devices and materials
7. evaluate methods and suggest possible improvements.

Test Design

The examination will be made up of three papers, Papers 1, 2 and 3.

As an alternative to Paper 3, Paper 6 will be provided for visually impaired candidates.

The examination will be made up of three components and structured as follows;

Paper	Code	Paper type	Duration	No. of Questions	Total marks	Weighting
1	5090/1	Theory, multiple choice	50 minutes	40	40	25%
2	5090/2	Theory, short/essay questions	1 hour 45 minutes	10	80	50%
3	5090/3	Practical	1 hour 15 minutes	2	40	25%
6	5090/6	Alternative to Practical	1 hour 15 minutes	3	40	25%
Total					160	100%

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Biology

5090/1

Paper 1 Multiple Choice

Additional Materials:

Multiple Choice answer sheet

Soft clean eraser

Soft pencil (type B or HB is recommended)

Time 50 minutes

Instructions to Candidates

Do not open this Question Paper until you are told to do so.

Write your name, centre number and candidate number on the Answer Sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer all questions. For each question there are four possible answers: **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read very carefully the instructions on the Answer Sheet.

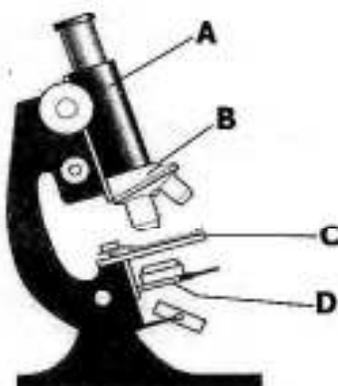
Information for Candidates

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this Question Paper.

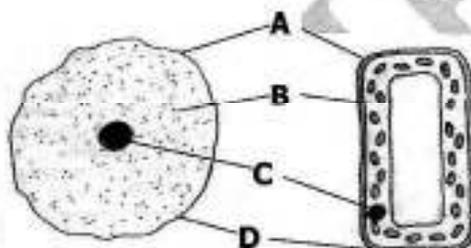
Cell phones are not allowed in the examination room.

- 1 The diagram below shows a microscope.



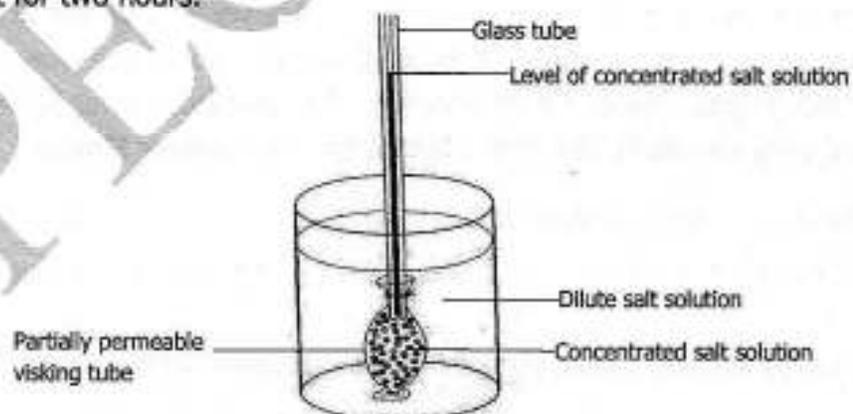
Which labelled part regulates the amount of light passing through the object?

- 2 The diagrams below show the cells from a leaf of a bean plant and a cell from the liver of a human being.



Which label is **not** pointing to the correct structure found in both cells?

- 3 The diagram shows an apparatus used to investigate osmosis. The apparatus was set up and left for two hours.



What would be the observation in this experiment?

	Level of liquid in glass tube	Explanation
A	Falls	Salt molecules moved out of the visking tube into the beaker.
B	Falls	Water molecules moved out of the visking tube into the beaker.
C	Rises	Salt molecules moved from the beaker into the visking tube.
D	Rises	Water molecules moved from the beaker into the visking tube.

4 The following are statements describing some characteristics of enzymes.

1. They are proteins.
2. They are secreted in the alimentary canal.
3. They speed up biochemical reactions.
4. None of them work at low pH.

Which of the statements above is correct for all enzymes?

- A** 1 and 3
B 1 and 4
C 2 and 3
D 2 and 4

5 A food sample was tested for the presence of nutrients and gave the following results:

- a purple colour with Biuret reagent.
- a blue colour when heated with Benedict's solution.
- a yellow colour with Iodine solution.
- a white emulsion with ethanol.

What nutrients did the food sample contain?

- A** Fat and Protein.
B Fat and Starch.
C Protein and Reducing Sugar.
D Reducing Sugar and Starch.

6 The table below shows the average daily intake of nutrients for four people.

Food	Person W	Person X	Person Y	Person Z
Carbohydrate	520g	30g	50g	40g
Fat	110g	200g	50g	20g
Iron	15mg	4mg	30mg	20mg
Protein	50g	180g	120g	65g
Vitamin C	95mg	100mg	10mg	80mg

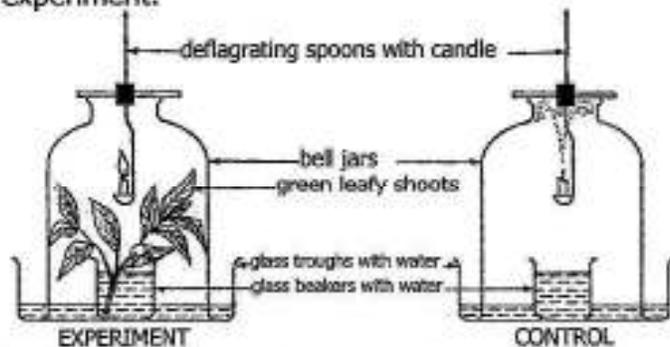
In which person will cuts on the skin be least likely to heal properly?

- A** W
B X
C Y
D Z

7 Which of the following signs shows that a plant was grown in a soil deficient in magnesium ions?

- A** Poor root growth.
B Small leaves.
C Stunted growth.
D Yellow leaves.

- 8 The apparatus below was an experiment set up to demonstrate photosynthesis. The candle in the experiment burnt longer than the candle in the control experiment.



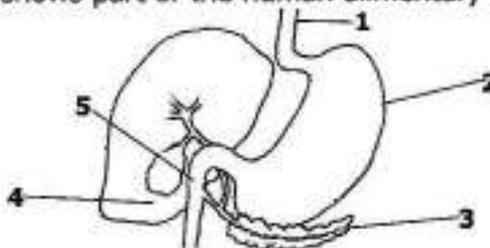
What conclusion can be drawn from the experiment?

- A Oxygen is liberated during photosynthesis.
 B Carbon dioxide is used during photosynthesis.
 C Water is used during photosynthesis.
 D Light energy is used during photosynthesis.
- 9 What type of nutrition is carried out by a *Rhizopus*?
- A Autotrophic nutrition.
 B Parasitic nutrition.
 C Photosynthesis.
 D Saprophytic nutrition.
- 10 The following is a dental formula of a dog

$$i:\frac{3}{3}, c:\frac{1}{1}, pm:\frac{4}{4}, m:\frac{2}{3}$$

How many premolars are in the upper jaw of the dog?

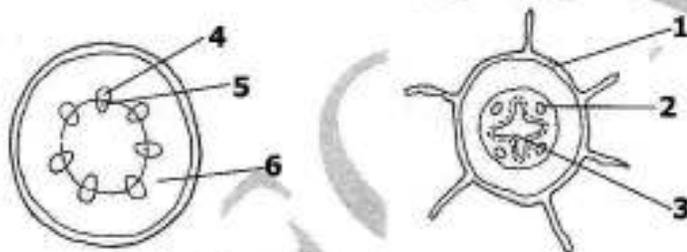
- A 2
 B 4
 C 6
 D 8
- 11 The diagram below shows part of the human alimentary canal.



Which two structures produce substances involved in the digestion of fat (lipid)?

- A 1 and 2
 B 1 and 5
 C 2 and 3
 D 3 and 4

- 12 Which equation represents anaerobic respiration in human muscles?
 A glucose \rightarrow carbon dioxide + ethanol (alcohol) + energy.
 B glucose \rightarrow carbon dioxide + lactic acid + energy.
 C glucose \rightarrow ethanol (alcohol) + energy.
 D glucose \rightarrow lactic acid + energy.
- 13 A medical officer in the Ministry of Health needs to introduce a publicity campaign to reduce the spread of AIDS. What advice should be included?
 A Do not drink from cups used by other people.
 B Do not kiss infected people.
 C Do not use soap and towels used by other people.
 D Have sexual intercourse with only one faithful partner.
- 14 Which of the following statements best describes the importance of Immunisation?
 A To monitor the growth of children.
 B For the body to produce antigens.
 C For the body to produce antibodies.
 D For the body to produce hormones.
- 15 The diagram shows sections from the root and stem of a plant.



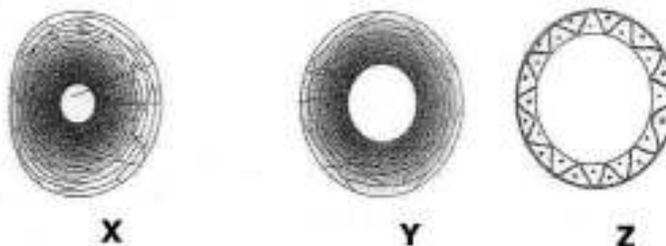
Which tissues conduct sucrose in solution?

	Root	Stem
A	1	5
B	2	4
C	2	6
D	3	5

- 16 Which one of the following correctly identifies the blood group with its antigen and antibody?

	Blood Group	Antigen	Antibody
A	A	A	A
B	B	A	B
C	AB	None	AB
D	O	None	A and B

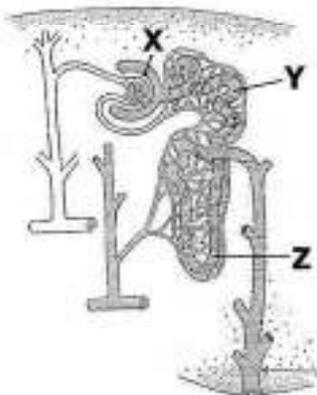
- 17 The diagram shows sections through three types of blood vessels, **X**, **Y** and **Z** (not drawn to scale).



What are the names of these blood vessels?

	X	Y	Z
A	Artery	Capillary	Vein
B	Artery	Vein	Capillary
C	Capillary	Vein	Artery
D	Capillary	Artery	Vein

- 18 The diagram below shows a nephron in a human kidney.



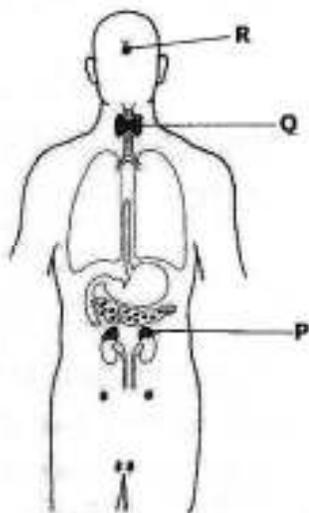
What processes occur at points **X**, **Y** and **Z**?

	X	Y	Z
A	Ultrafiltration	Selective reabsorption	Osmoregulation
B	Ultrafiltration	Osmoregulation	Selective reabsorption
C	Selective reabsorption	Osmoregulation	Ultrafiltration
D	Selective reabsorption	Ultrafiltration	Osmoregulation

- 19 What happens when human body temperature falls below 37°C?

	Blood flow to skin	Sweating
A	Decreased	Decreased
B	Decreased	Increased
C	Increased	Decreased
D	Increased	Increased

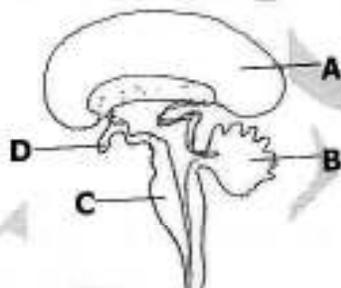
- 20 The diagram below shows some of the endocrine glands in humans.



Which hormones are produced in the glands labelled **P**, **Q** and **R**?

	P	Q	R
A	ADH	Insulin	Adrenalin
B	ADH	Thyroxine	Glucagon
C	Adrenalin	ADH	Thyroxine
D	Adrenalin	Thyroxine	ADH

- 21 The diagram shows a section through the brain and part of the spinal cord.



Which region controls the breathing rate and heart rate?

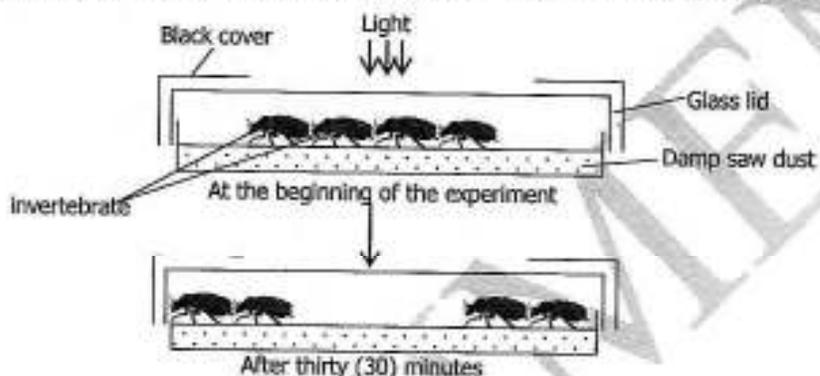
- 22 Which of the following correctly identifies the part of the ear and the structure found in it?

	Outer ear	Middle ear	Inner ear
A	Cochlea	Eustachian tube	Pinna
B	Cochlea	Pinna	Ossicles
C	Pinna	Ossicles	Cochlea
D	Pinna	Cochlea	Eustachian tube

- 23 Which of the following correctly differentiates a hinge joint from a ball and socket joint?

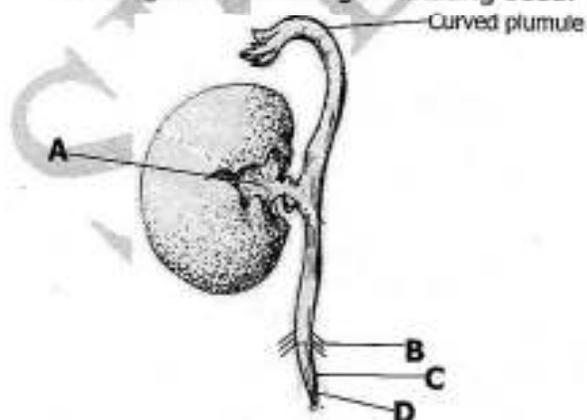
	Hinge joint	Ball and socket
A	Allows movement in three planes	Allows movement in one plane
B	Allows movement in one plane	Allows movement in three planes
C	Is a fixed joint	Is a movable joint
D	Is found at the shoulder	Is found at the knee

- 24 The diagram shows a set-up of an experiment to demonstrate the behaviour of invertebrates placed in a partially covered glass box exposed to light.



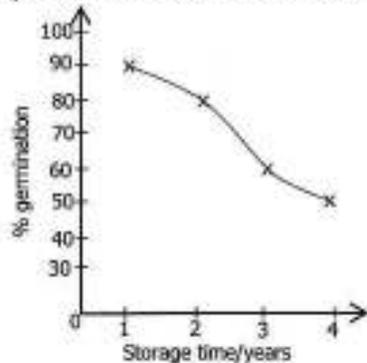
What response is shown by these animals in this experiment?

- A Negative phototaxis.
 - B Negative phototropism.
 - C Positive phototaxis.
 - D Positive phototropism.
- 25 The diagram shows a germinating seed.



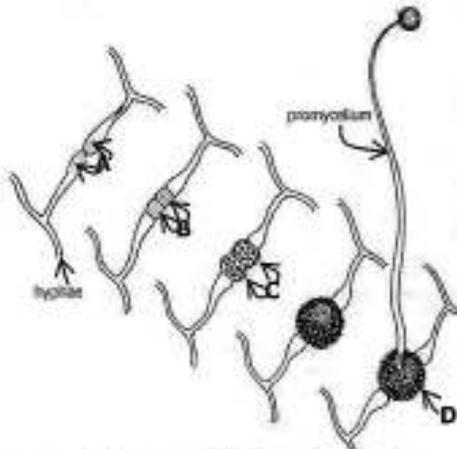
Which part is the region for cell differentiation?

- 26 The graph shows the effect of storage time on the germination of some seeds.



What can be concluded from the graph?

- A Older seeds do not germinate.
 B Older seeds germinate better than younger seeds.
 C Younger seeds always germinate.
 D Younger seeds germinate better than older seeds.
- 27 The diagram below shows sexual reproduction in fungus.



Which of the labelled stages is the zygospore?

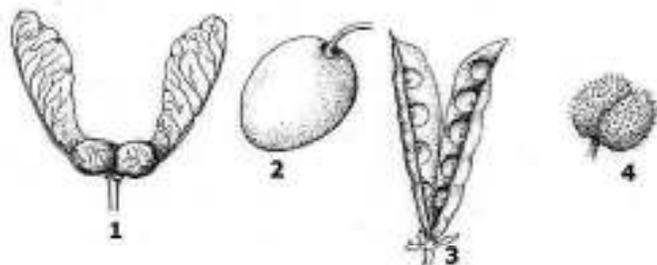
- 28 Some of the events which occur during sexual reproduction in a flowering plant are listed below.
1. Male gamete fuses with female gamete.
 2. Anthers split open.
 3. Growth of pollen tube.
 4. Pollen grain sticks to stigma.
 5. Seed develops inside ovary.

In which order do these events take place?

First → Last

A	2	4	3	1	5
B	3	2	4	5	1
C	4	2	1	5	3
D	4	2	3	1	5

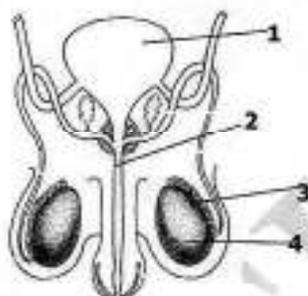
29 The diagrams show four different types of fruits.



Which two fruits are dispersed by animals?

- A 1 and 2
- B 1 and 3
- C 2 and 4
- D 3 and 4

30 The diagram shows a section through the male reproductive system.



In which numbered parts are sperms produced and where are they stored?

	Production of sperms	Storage of sperms
A	1	2
B	2	3
C	3	1
D	4	3

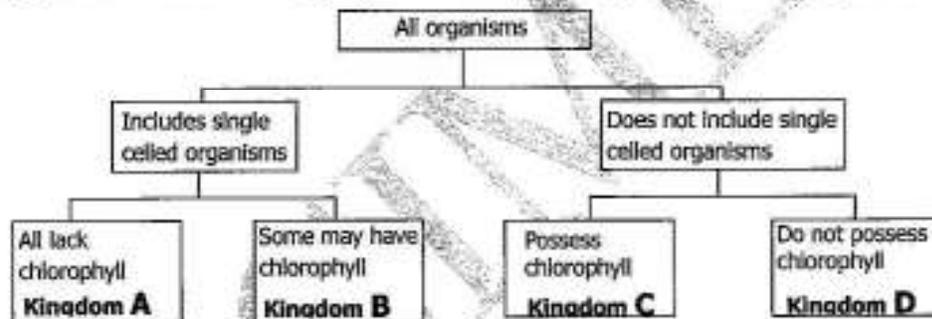
31 How often is an ovum usually released from the ovaries of a woman?

- A Once a week.
- B Once every 14 days.
- C Once every 28 days.
- D Once every 9 months.

32 Birth control methods may be classified as hormonal, mechanical and behavioural. Which is the correct identification of each of these groups?

	Behavioural	Hormonal	Mechanical
A	Condom	Spermicide	Rhythm
B	Condom	Intra-uterine device (IUD)	Vasectomy
C	Rhythm	Condom	Spermicide
D	Rhythm	Pill	Diaphragm

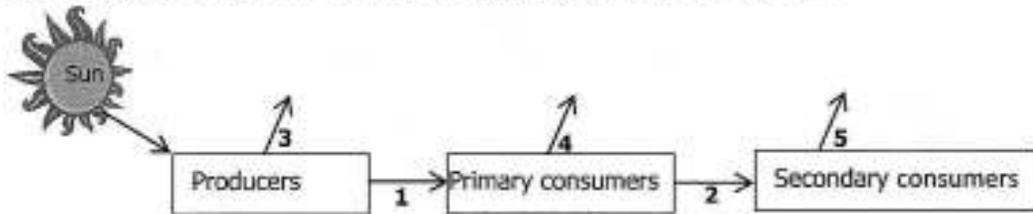
- 33** In cats, the gene for folded ear is dominant to the gene for normal ear. Over a period of years, two cats which were heterozygous for the gene, produced a total of 120 kitten. What would be the expected ratio of folded ear to normal ear amongst these offspring?
- A** 90:30
B 80:40
C 60:50
D 30:90
- 34** Which of the following genetic diseases is caused by chromosomal mutation?
- A** Colour blindness.
B Downs syndrome.
C Haemophilia.
D Sickle cell anaemia.
- 35** The diagram shows how living organisms may be separated into kingdoms.



Which kingdom represents the fungi?

- 36** A metal crucible weighing 25g was half filled with a fresh sample of soil and was weighed. The new mass was 50g. It was left overnight in an oven at 102°C and by the morning the mass was 44g. What was the percentage by mass of water in the original soil sample?
- A** 6%
B 12%
C 24%
D 33%

- 37 The diagram shows the flow of energy through an ecosystem.



Which arrows represent the least amount of energy transferred between organisms and greatest amount of energy lost to the environment?

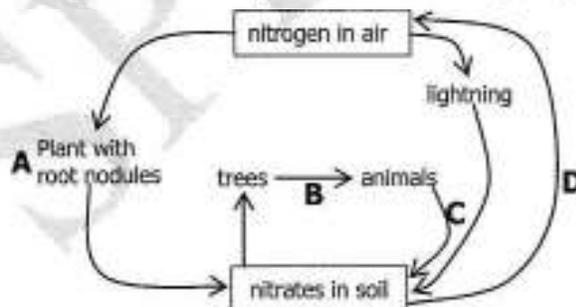
	Least energy transferred	Greatest energy lost
A	1	4
B	1	5
C	2	3
D	2	4

- 38 The following are events which occurred in a given town leading to a reduction in the number of people in that area from 1500 to 1300.

- 1 100 people shifted to the nearest town.
- 2 Heavy rainfall resulting in massive floods.
- 3 Outbreak of cholera due to garbage.
- 4 Improved medical facilities.

Which of these events would reduce the population size of this community?

- A 1, 2, 3
 B 1, 2, 4
 C 1, 3, 4
 D 2, 3, 4
- 39 The diagram below represents the nitrogen cycle.



At which point in the cycle are nitrogen fixing bacteria found?

- 40 Which of the following does **not** reduce biodiversity?
- A Deforestation
 B Overfishing
 C Poaching
 D Tourism

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Candidate Name _____

Centre Number				Candidate Number			

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Biology

509072

Paper 2 Theory

Additional Information:
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: Short answer questions [44 marks]

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

1 Figure 1.1. shows a light microscope.

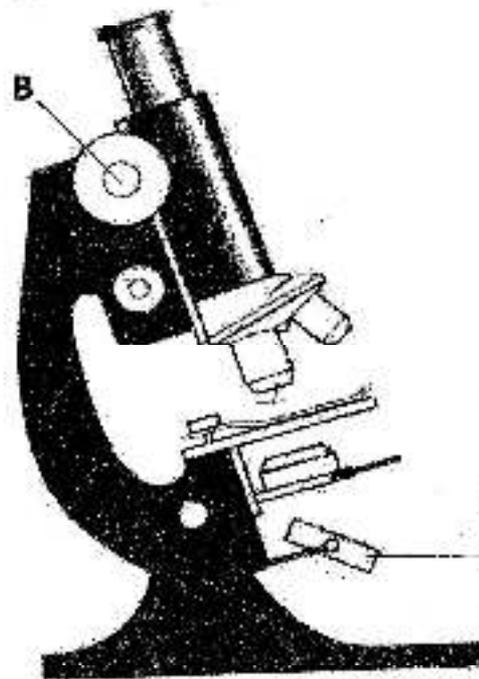


Figure 1.1

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

A

B

[2]

(ii) Using letter **X**, label on **figure 1.1**, one part where magnification takes place?

[1]

(b) Outline the correct procedure to follow in order to use a microscope to view a specimen.

.....
.....
.....

[3]

(c) Describe how magnification is determined when using a microscope.

.....
.....

[2]

Total 8 marks

2.1. shows part of the alimentary canal, and its associated parts.

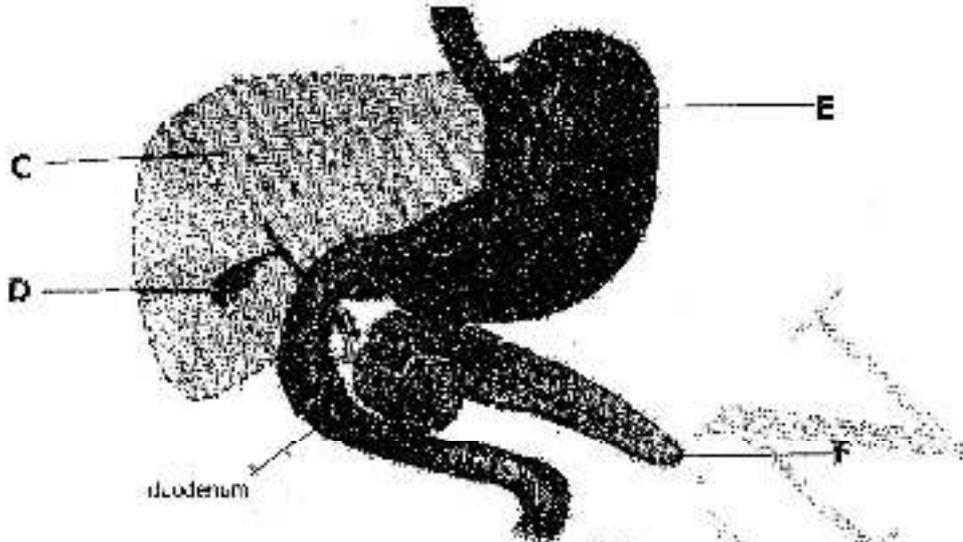


Figure 2.1

- (a) (i) In which labelled structure in **Figure 2.1**, are bile salts produced?
..... [1]
- (ii) Explain the role of bile salts in digestion.
.....
..... [2]
- (b) (i) In which labelled structure in **Figure 2.1**, are proteins first digested?
..... [1]
- (ii) Explain how protein digestion takes place in the structure identified in (b) (i) above.
.....
..... [3]
- (c) Name **two** common ailments of structure **C**.
- 1
2 [2]

Total 9 marks

3 Figure 3.1. shows a section through the heart.

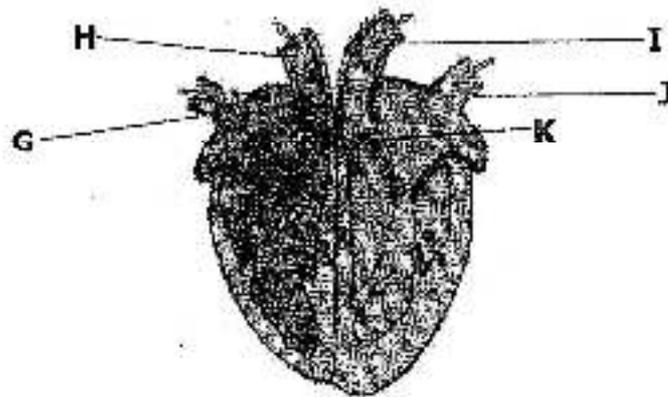


Figure 3.1

(a) (i) From Figure 3.1, identify the **two** blood vessels labelled **G** and **I**.

G

I

[2]

(ii) Which of the labelled blood vessels carry oxygenated blood back to the heart?

.....

[1]

(iii) Identify valve **K** and state its function.

Valve K:

Function:

[2]

(b) Describe the movement of blood from the time it enters the heart at **J** until it exits at **I**.

.....

.....

.....

[2]

(c) Some poor diets can increase the risk of a heart attack.

Suggest **two** other factors apart from diet that could increase the risk of a heart attack.

.....

.....

.....

[2]

Total 9 marks

4.1. below shows a root system of a leguminous plant.

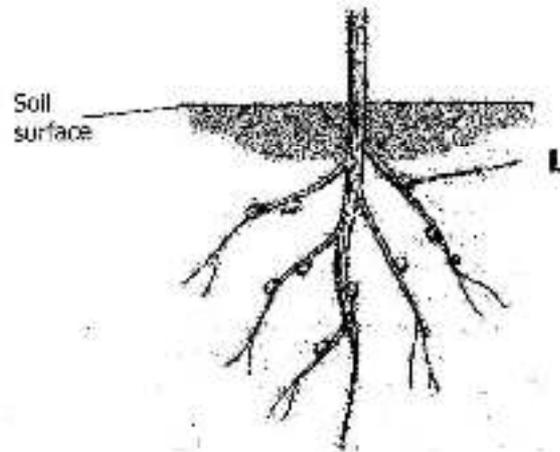


Figure 4.1

(a) (i) Identify structure **L** in **Figure 4.1** above.

L [1]

(ii) State the micro-organism found in structure **L**.

..... [1]

(iii) Explain the role of the micro-organism named in (ii) above in the nitrogen cycle.

..... [2]

(b) Explain the role this plant in **Figure 4.1** plays in the

(i) Carbon cycle.

..... [3]

(ii) Water cycle.

..... [2]

Total 9 marks

5 Blood group inheritance in humans is controlled by three alleles, I^A , I^B and I^O .

(a) Using appropriate genetic symbols, draw a genetic diagram to explain the possible blood groups of children whose parents are both heterozygous for their blood groups, the father being blood group A and the mother blood group B.

(b) Using a named example, explain

(i) Continuous variation.

Explanation:

[5]

[1]

Example:

[1]

(ii) Discontinuous variation.

Explanation:

[1]

Example:

[1]

Total 9 marks

Section B: Essay questions [36 marks]

Answer any three questions from this section. All answers must be in complete sentences and paragraphs.

- 6 (a) Describe the following:
- (i) common causes of blindness.
 - (ii) common methods of preventing blindness. [6]
- (b) Describe the effects of abuse of a **named** drug on the nervous system. [6]
- Total 12 marks**
- 7 (a) Describe the processes of fertilization and implantation in humans. [6]
- (b) Describe ways of maintaining a healthy pregnancy and safe childbirth. [6]
- Total 12 marks**
- 8 (a) What role is played by the following structures of the skin in controlling the temperature of the body during over cooling.
- (i) Erector muscle
 - (ii) Blood vessels [6]
- (b) Explain the metabolic functions of the liver. [6]
- Total 12 marks**
- 9 (a) Describe the following deficiency diseases in plants.
- (i) Chlorosis
 - (ii) Leaf flecking [4]
- (b) Discuss the functions of the nutrients phosphorus, nitrogen and magnesium in plant growth. [8]
- Total 12 marks**
- 10 (a) Discuss the importance of the following responses exhibited by plants:
- (i) Phototropism
 - (ii) Geotropism
 - (iii) Hydrotropism [8]
- (b) State and explain toxic responses exhibited by invertebrates. [4]
- Total 12 marks**

Centre Number				Examination Number									

3 Figure 3.0 below shows a section through a nephron.

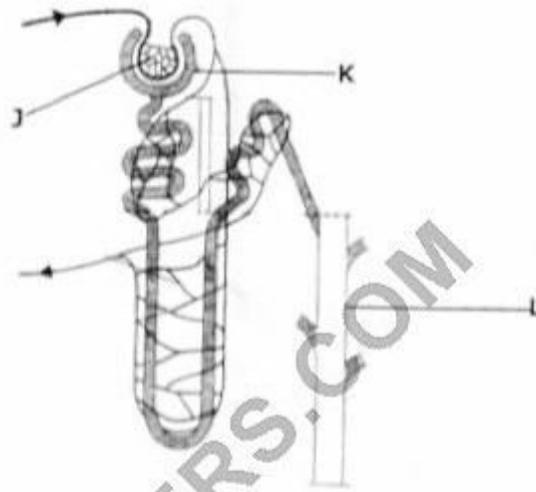


Figure 3.0

(a) Name the parts labelled J, K and L.

- J [1]
- K [1]
- L [1]

(b) (i) Suggest **three** substances that are **not** filtered out at J.

- 1 [3]
- 2 [3]
- 3 [3]

(ii) Explain what would happen at J if the coiling of the blood capillary was increased.

- [1]
- [1]

(c) Name the hormone that causes the reabsorption of water in the kidney and the organ where it is produced.

- Hormone [1]
- Name of organ [1]

[Total: 9]

Centre Number	Examination Number

4 Figure 4.0 below shows the external parts of the human eye.

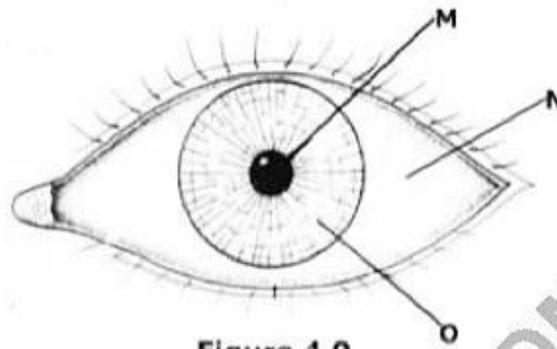


Figure 4.0

- (a) (i) Name the parts labelled **M** and **N**.
- M** [1]
- N** [1]
- (ii) Explain how **N** is adapted to its function.
- [2]
- (b) Describe the role played by **M** and **O** when a person moves to a room with dim light.
- M** [3]
- O**
- (c) Explain the cause of short sightedness and how it can be corrected.
- Causes**
-
- Correction**
- [2]
- [Total: 9]

Centre Number				Examination Number										

5 Red-green colour blindness is a sex-linked characteristic.

(a) (i) Define 'sex-linked characteristic'.

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

(ii) What can cause sex-linked genetic disorders like the red-green colour blindness?

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

(b) A normal couple had a colour blind son. Using the gene 'R' for normal colour vision and gene 'r' for colour blindness, write down the genotypes of:

(i) father

(ii) mother [2]

(c) Using a genetic diagram, show how the son could have been born colour blind.

[4]

[Total: 8]

Centre Number	Examination Number

Section B [36 marks]

Answer any **three** questions.

All answers should be in sentence form and in paragraphs.

- 6** (a) Describe the health risks associated with foetal development in humans. [4]
- (b) Describe the benefits and possible risks of using contraceptive pills and injections. [4]
- (c) Explain other methods of birth control in humans apart from the use of contraceptive pills and injections. [4]
- [Total: 12]**
- 7** (a) Explain the components of blood plasma. [3]
- (b) Investigate and describe the common blood disorders. [9]
- [Total: 12]**
- 8** Describe malaria as a disease under the following:
- (a) causative agent, [1]
- (b) signs and symptoms, [7]
- (c) methods of transmission and control. [4]
- [Total: 12]**
- 9** (a) With the help of **named** examples, describe the different types of skeletons. [8]
- (b) Explain the functions of the vertebral column. [4]
- [Total: 12]**
- 10** (a) Explain the meaning of the following ecological terms:
- (i) Species, [2]
- (ii) Niche, [2]
- (iii) Habitat. [2]
- (b) Identify the undesirable effects of water pollution by raw sewage. [6]
- [Total: 12]**

Centre Number				Examination Number									

5090-2-050-200

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

Biology
Paper 2 Theory

5090/2

2020

Additional materials:
Answer Booklet

Time: 1 hour 45 minutes

Marks: 80

Instructions to Candidates

- 1 Write the **centre number** and your **examination number** on every page of this question paper and on the separate **Answer Booklet** provided.
- 2 There are **ten** questions in this paper.
- 3 **Section A**
 - (i) Answer **all** questions.
 - (ii) Write your answers in the spaces provided on the question paper.
- 4 **Section B**
 - (i) Answer any **three** questions.
 - (ii) Write your answers in the Answer Booklet provided.
- 5 At the end of the examination:
 - (i) fasten the Answer Booklet used securely to the question paper.
 - (ii) **enter** the numbers of the Section B questions you have answered in the grid on the bottom right side corner.

FOR EXAMINER'S USE	
Section A	
Section B	
Total	

Information for Candidates

- 1 The number of marks is given in brackets [] at the end of each question or part question.
- 2 You are advised to spend no longer than one hour on Section A and no longer than 45 minutes on Section B.
- 3 **Cell phones are not allowed in the examination room.**

Centre Number				Examination Number									

Section A [44 marks]

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

1 Figure 1.0 shows a plant cell.

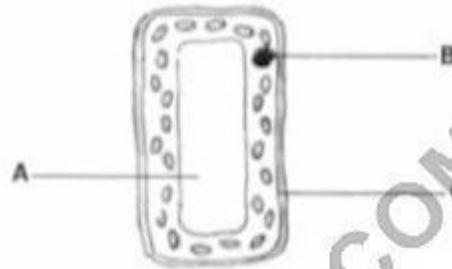


Figure 1.0

(a) (i) Name the parts labelled **A**, **B** and **C**.

A [1]

B [1]

C [1]

(ii) Name the organ in the plant in which **figure 1.0** is found.
Give a reason for your answer.

Organ of plant.....

Reason

..... [2]

(b) Describe **two** adaptations of the cell in **figure 1.0** which enable it to carryout its functions.

Adaptation 1 [1]

Adaptation 2 [1]

(c) Explain what would happen to the cell in **figure 1.0** above, if it was placed in a test tube containing distilled water.

.....

..... [2]

[Total: 9]

Centre Number	Examination Number																			

2 Figure 2.0 below shows the internal structure of a tooth.

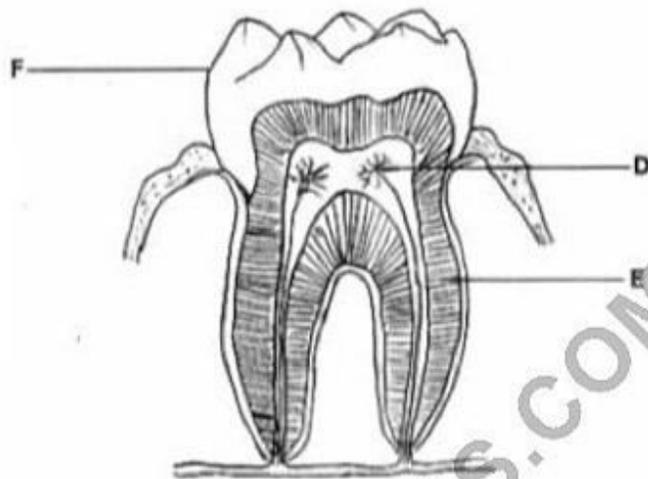


Figure 2.0

(a) Name the parts labelled **D** and **E** in **figure 2.0** above.

D [1]

E [1]

(b) (i) Explain what happens to the part labelled **F** during tooth decay.

..... [3]

(ii) Looking at the shape of the tooth in **figure 2.0** above, suggest the role it plays in the digestion of food.

..... [1]

(c) Complete the human dental formula below by filling in the missing numbers **G**, **H** and **J**.

$$G \left(\begin{matrix} 2 & c & 1 & & 2 \\ 2 & H & & pm & 2 \\ & & & & m & J \\ & & & & & 3 \end{matrix} \right) = 32$$

G [1]

H [1]

J [1]

Candidate Name _____

Centre Number	Candidate Number

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Biology

5090/3

Paper 3 Practical Test

Wednesday

22 NOVEMBER 2017

Additional materials:
As listed in instructions to Supervisors

Time 1 hour 15 minutes

Instructions to Candidates

Write your **name**, **centre number** and **candidate number** in the spaces provided at the top of this page.

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

Answer **both** questions.

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

Information for candidates

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

Cell phones are not allowed in the examination room.

<i>For Examiner's Use</i>	
1	
2	
Total	

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Answer both questions

1 (a) Examine specimen **D1A** and answer the questions that follow.

- (i) What part of a plant is specimen **D1A**?
..... [1]
- (ii) Explain why specimen **D1A** is considered a stem.
..... [1]
- (iii) State the functions of **D1A** in a plant.
..... [1]
- (iv) Describe the method used for propagation of specimen **D1A**.
..... [1]

(b) You are provided with specimen **D1B** which was taken from **D1A**. Extract a solution from specimen **D1B** using the materials provided.

- (i) Describe the method used to extract the solution from specimen **D1B**.
..... [3]
- (ii) Using the extract from **D1B** carry out the following food tests.

Specimen	Reagent	Procedure	Observation	Conclusion
D1B	Iodine solution			
	Benedict's solution			
	Biuret Reagent			

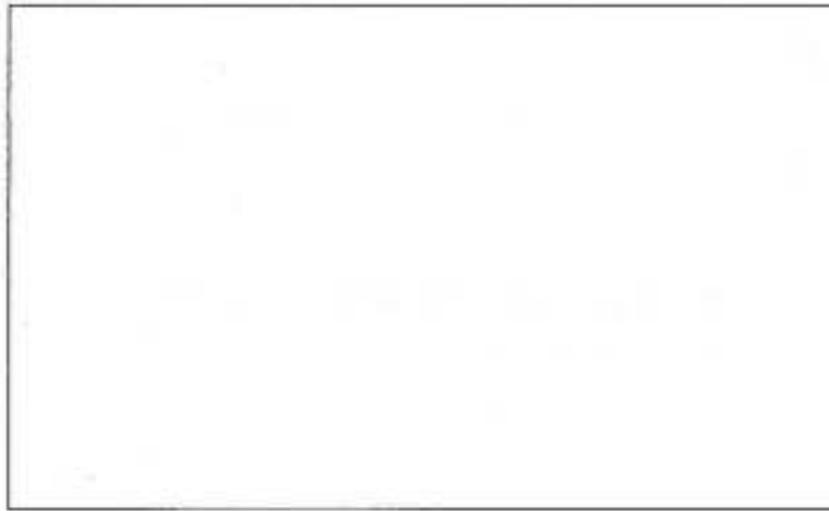
[12]

- (iii) Explain why specimen **D1B** is not a good source of food for a malnourished person.

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

[Total: 20 marks]

- 2 (a) You are provided with specimen **W33** and **W34**. Make a large labelled drawing of the cut surface of **W33**.



[8]

- (b) (i) Measure the diameter of specimen **W33** and record the measurement.
..... [1]
- (ii) Measure the diameter of your drawing. Draw a line across the diagram where the measurement was taken.
..... [1]
- (iii) Calculate the magnification of the drawing using the measurements obtained.

[3]

- (c) State **three** similarities between **W33** and **W34**.
- (i)
 - (ii)
 - (iii) [3]
- (d) State **three** differences between **W33** and **W34**.
- (i)
 - (ii)
 - (iii) [3]
- (e) State how new plants can be produced from specimen **W33**.
- [1]
-

[Total: 20 marks]



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Candidate Name _____

Centre Number			Candidate Number						

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

Biology Paper 3 Practical Test

5090/3

Wednesday

12 JULY 2017

Additional materials:
As listed in Instructions to Supervisors

Time 1 hour 15 minutes

Instructions to Candidates

Write your **name**, **centre number** and **candidate number** in the spaces provided at the top of this page.

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

Answer **both** questions.

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

Information for candidates

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

Cell phones are not allowed in the examination room.

For Examiner's Use	
1	
2	
Total	

Answer both questions

1 You have been provided with solution **A**, **B** and **C**.

(a) Carry out a reducing sugar test on each of the solutions provided.

(i)

Solution	Method	Observation	Conclusion
A			
B			
C			

[9]

(ii) State the blood vessel leading to the liver from which the solution in **A** could have been extracted.

..... [1]

(iii) State the blood vessel leading to the liver from which the solution in **B** could have been extracted.

..... [1]

(iv) State the function of the nutrient found in solution **A**.

..... [1]

(v) State the hormone related to regulation of the nutrient in solution **A**.

..... [1]

(b) You are provided with specimen **W29**.
Put a few drops of iodine solution to cover the cut surface of the specimen.

(i) State the food nutrient found in specimen **W29** as shown by the test.

..... [1]

(ii) Draw an outline of the cross section of specimen **W29** and show the areas where the food nutrient is present.



[3]

(iii) Explain how the food nutrient in specimen **W29** is used as a source of energy in plants.

.....
.....
.....
.....
.....

[3]

[Total: 20 marks]

2 You are provided with specimen **W30** and **W31**, which are fruits from dicotyledonous plants.

(a) (i) Describe how specimen **W30** disperses its seeds.

.....

[4]

(ii) State the type of dispersal found in specimen **W30** and **W31**.

W30

[1]

W31

[1]

(iii) Give a reason for your answer in (a)(ii) above.

W30

[1]

W31

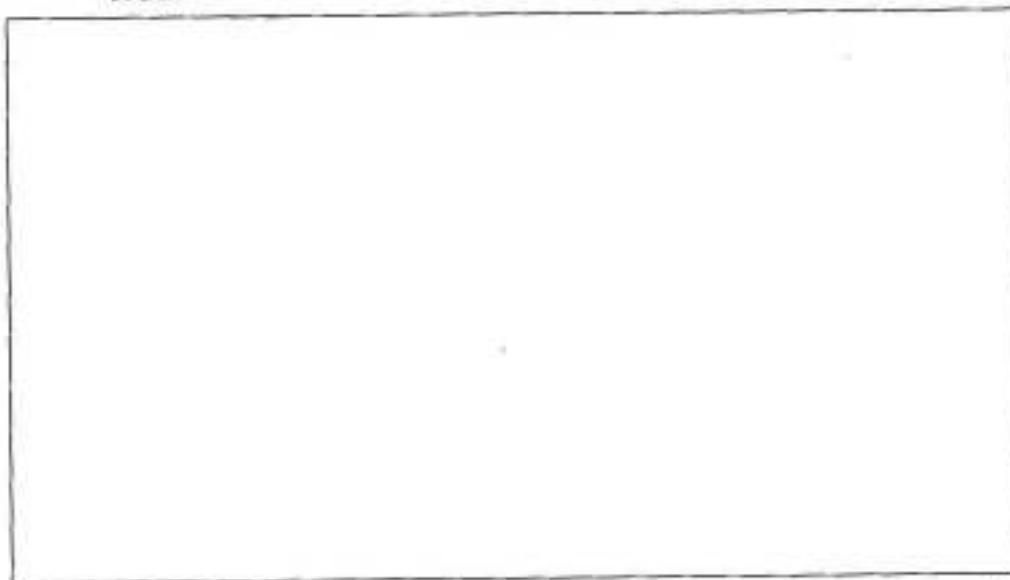
[1]

(b) (i) Measure and record the diameter of the longitudinal section of specimen **W31**.

.....

[1]

(ii) Make a large labelled diagram of the longitudinal section of specimen **W31**.



[7]

(iii) Measure and record the diameter of the drawing.

.....

[1]

- (iv) Calculate the magnification of your drawing using the measurements obtained above.

.....
.....
.....
.....

[3]

- (c) Explain why specimen **W31** is referred to as a false fruit.

.....
.....

[1]

[Total: 20 marks]



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EXAMINATIONS COUNCIL OF ZAMBIA

Examination for General Certificate of Education Ordinary Level

Biology

5090/6

Paper 6 Alternative to Practical

Wednesday

12 JULY 2017

Additional Materials:

Answer paper

Diagram Booklet

Print Version of Braille Paper

Time 1 Hour 15 Minutes

Instructions to Candidates

Write your **name**, **centre number** and **candidate number** on the answer paper.

There are **three (3)** questions in this paper.

Answer **all** questions.

Write your answers on the answer paper.

Information for Candidates

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

Cell phones are not allowed in the examination room.

1 A farmer kept one black male pig and one white female pig on the farm. After mating them, the female gave birth to ten (10) white piglets of which five (5) were male and five (5) were female. Use capital letter **W** to represent the allele for white and small letter **w** to represent the allele for black. Explain using a genetic description to show how it was possible for the female piglet to produce all white piglets.

- (a) (i) State the genetic make up of the:
Male parent pig: [1]
Female parent pig:..... [1]
- (ii) State the phenotype of the:
Male parent pig: [1]
Female parent pig:..... [1]
- (iii) Write the possible genotypes of the piglets in the first filia (F1) generation.
.....;; [4]
- (iv) Which one between the female and male parent pigs has recessive genes in relation to the coat colour?
..... [1]
- (v) What is the ratio of male to female piglets?
..... [1]
- (b) What type of variation is shown by:
- (i) the sex of piglets
..... [1]
- (ii) the height of piglets
..... [1]
- (iii) the coat colour of piglets
..... [1]
- (c) What does the term variation mean?
..... [1]

[Total: 14 marks]

- 2 A nutritionist wanted to establish the food nutrient in a new soft drink on the market. To do this he carried out some food tests on the soft drink as follows:
- (i) Heated the soft drink in Benedict solution and the drink turned orange.
 - (ii) Soft drink was tested with Biuret reagent and it remained blue.
 - (iii) Iodine solution was added to the soft drink and it turned blue-black.
- (a) (i) Based on the results, state the nutrient(s) present in the soft drink.
- [1]
- [1]
- (ii) State one important function of the food nutrients you have mentioned in (a) (i) above.
- [1]
- (iii) From the results above, what food nutrient is absent in the soft drink.
- [1]
- (iv) State the type of energy found in food eaten by human beings.
- [1]
- [1]
- (v) What is the SI unit for energy?
- [1]
- (b) It is necessary that human diet contains all major food nutrients. However, vitamins are required in small quantities in the human body and yet their role is very important.
- (i) What are vitamins?

..... [2]

 - (ii) Name two water soluble vitamins.

..... [2]
- (c) Calcium is one of the minerals required in small quantities by the human body.
- (i) What is the function of calcium in the human body?

..... [1]

- (ii) What would be the implication of absence of calcium in the diet of a human being?

.....
.....
.....
.....

[3]

- (d) Table salt (sodium chloride) is constantly lost from the human body in urine and faeces.

What is the effect of rapid loss of salt from the human body?

.....
.....

[2]

[Total: 16 marks]

- 3 (a) Name the class for each of the animals whose characteristics are described below.
- (i) Has fur on its body [1]
 - (ii) Has feathers [1]
 - (iii) Has exoskeleton with three body parts [1]
 - (iv) Has gills and scales [1]
- (b) A man crossed a zebra and a horse on his ranch. He inter bred them because they belonged to the same genus. However, there were no offspring produced.
- (i) Give a reason [1]
 - (ii) Classify the zebra based on the levels of classification below.
 - Kingdom [1]
 - Phylum [1]
 - Class [1]
- (c) State any **two** kingdoms in living organisms. [2]

[Total: 10 marks]



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