EXAMINATIONS COUNCIL OF ZAMBIA

Joint Examination for the School Certificate
and General Certificate of Education Ordinary Level

BIOLOGY 5090/2

PAPER 2 Theory

Tuesday 7 OCTOBER 2014

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.

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This question paper consists of 7 printed pages.

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Section A  [44 marks]

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

1  Figure 1.0 shows organisms in an ecosystem.

(a) Using letters classify the following organisms in Figure 1.0

<table>
<thead>
<tr>
<th>Group</th>
<th>Letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angiosperm</td>
<td></td>
</tr>
<tr>
<td>Reptile</td>
<td></td>
</tr>
<tr>
<td>Fungi</td>
<td></td>
</tr>
</tbody>
</table>

[3]

(b) What type of nutrition is carried out by organisms E and H?

Organism E: .................................................................................................................................. [2]

Organism H: .................................................................................................................................. [2]

(c) State two differences between the cells found in organisms G and H.

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

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

(d) Construct a food chain using organisms found in Figure 1.0.

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

[Total 9]
2 *Figure 2.0* shows the movement of dissolved substances in the digestive system and some associated parts.

![Diagram of digestive system]

*Figure 2.0*

(a) Name the structures labelled I and J.
   I: ..................................................................................................................[2]
   J: ..................................................................................................................[2]

(b) (i) Name one product of digestion in the ileum which is not transported by blood.
   ..................................................................................................................[1]

   (ii) Name the enzyme in the ileum whose activity produces glucose.
   ..................................................................................................................[1]

(c) Substance K when broken down produces a waste substance and glycogen.

   (i) Identify substance K
   ..................................................................................................................[1]

   (ii) Suggest two uses of substance K in the body.
   1. ..................................................................................................................
   2. ..................................................................................................................[2]

(d) State under what conditions the product in structure J is produced.

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

[Total: 9]

[Turn over]
3 Figures 3.1 and 3.2 show part of the circulatory system in humans.

Figure 3.1
(a) Identify the two types of circulation illustrated in Figures 3.1 and 3.2.

Figure 3.1.................................................................................................................. [2]

Figure 3.2.................................................................................................................. [2]

(b) (i) Suggest the names of blood vessels labelled M and O in figure 3.1 and 3.2.

Blood vessel M: ........................................................................................................ [2]

Blood vessel O: ........................................................................................................ [2]

(ii) State two differences between blood vessels M and O.

1 .................................................................................................................................

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

2. .................................................................................................................................

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

(c) State the name of the heart chamber labelled P in Figure 3.1.

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

(d) State two blood disorders found in humans.

1 .................................................................................................................................

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

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

[Total 9]
Figure 4.0 shows the longitudinal section through a human kidney.

![Diagram of a human kidney with labeled parts: Cortex, Medulla, Q, R, S.]

(a) (i) Identify the blood vessels labelled Q and R.

Q: ................................................................. [2]
R: ................................................................. [2]

(ii) State two waste substances that are likely to be present in the liquid which pass through the structure labelled S.

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

(b) State two processes that occur in the kidney during urine formation.

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

(c) (i) Suggest two methods of how a person with kidney failure may live a normal life.

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

(ii) State the hormone that affects osmoregulation in the kidney.

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

[Total: 9]

[Turn over]
5  (a) Explain what is meant by the term sex-linked characteristic.

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

(b) The allele for haemophilia (h) is a recessive allele carried on the non-homologous pair of the X chromosome.

(i) A couple is both normal to this trait. They have three sons, two of whom are haemophilic. Use a genetic diagram to explain how this may occur. [5]

(ii) What is the probability of their next son being haemophilic? ........................................................................................................................................... [1]

[Total: 8]
Section B [36 marks]
Answer any three questions.

All answers should be in sentence form in paragraphs.

6 (a) Explain what is meant by the term aerobic respiration. [2]
(b) Describe the adverse effects of named air pollutants on the health of human beings. [6]
(c) Explain how some parts of the respiratory system are adapted to minimise the entry of air pollutants into the lungs. [4]

[Total: 12]

7 (a) Using named examples explain how fruits and seeds are adapted to fruit/seed dispersal. [6]
(b) Explain the advantages and disadvantages of vegetative propagation. [6]

[Total: 12]

8 (a) Explain what is meant by the term positive phototropism. [2]
(b) Explain the effects of gravity on the plumule and radical in a germinating seed. [4]
(c) Compare and contrast the hormones adrenalin and glucagon. [6]

[Total: 12]

9 (a) Distinguish between a ball-and-socket joint and a hinge joint. [2]
(b) Describe the action of antagonistic muscles in the straightening and bending of the arm. [4]
(c) Differentiate between the thoracic and lumbar vertebrae in human beings. [6]

[Total: 12]

10 (a) Describe the life cycle of a mosquito. [4]
(b) With reference to the disease bilharzia, discuss its ............
   (i) signs and symptoms. [4]
   (ii) method of transmission. [4]

[Total: 12]

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