GENERAL CERTIFICATE OF EDUCATION (GCE) BOARD

General Certificate of Education Examination

0565 Human Biology 2

JUNE 2021 **ORDINARY LEVEL**

Subject Title	**Human Biology**
Paper No.	2
Subject Code No.	0565

Two and a half hours

You are required to answer FIVE questions, choosing THREE from Section A and TWO from Section B. All the questions carry equal marks allocated to parts of questions are indicated.

Extra questions answered from each section shall NOT be marked.

You are reminded of the necessity for good English and orderly presentation in your answers.

SECTION A

Answer FIVE questions from this Section

1) a) Define each of the following terms and give an example in each case:
- **i)** Cell
- **ii)** Tissue
- **iii)** Organ

b) Draw a large and neatly labelled diagram of a typical animal cell as seen under the electron microscope.

c) In tabular form, distinguish between a typical animal cell and a plant cell.

(6, 8, 6 marks)

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2) a) Define aerobic respiration.

b) Describe the ventilation (breathing) mechanism in humans.

c) State the adaptions of the alveolus that permit it to carryout gaseous exchange.

(2, 13, 5 marks)

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3) a) Draw a large and neatly labelled diagram of the transverse section of the human skin.

b) Explain how the skin regulates the body temperature during conditions of:
- **i)** Overheating
- **ii)** Overcooling

c) State how the skin prevents the entry of pathogens into the body.

(8, 8, 4 marks)

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4) a) Distinguish between each of the following:
- i) Red blood cells and white blood cells
- ii) Arteries and veins.

b) Explain how the structure of the red blood cells is adapted to its function of transport of respiratory gases.

c) Why are people of blood group O and blood group AB regarded as universal donors and universal recipients respectively?

(5, 6, 5, 4 marks)

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5) a) Define the following terms as used in genetics:
- **i)** Allele
- **ii)** Phenotype
- **iii)** Heterozygous.

b) Sickle-cell anaemia is an inherited disease caused by a gene mutation on the haemoglobin molecule. Using suitable symbols and genetic diagrams, determine the genotypes, phenotypes and probability of the offspring of a man who is a carrier of sickle-cell trait and who marries a normal non- carrier woman.

c) i) What is a mutation?

ii) State four mutagenic agents.

(6, 8, 6 marks)

SECTION B

Answer TWO questions from this Section

6) a) Explain what is meant by each of the following terms;

i) Ecosystem

ii) Food web

iii) Trophic level

iv) Population.

b) Describe how energy flows through and is lost from an ecosystem.

c) i) Construct a food chain with four trophic levels from the following list of organisms: hawk, small birds, garden snails, lettuce and man.

ii) Explain why most food chains consist of not more than four or at most five trophic levels?

(8, 8, 4 marks)

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7) a) Define the term photosynthesis.

b) State the ways in which the leaf is adapted for photosynthesis.

c) Outline the fate of the end products of photosynthesis.

(4, 8, 8 marks)

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8) The scheme below illustrates the steps in the treatment of sewage by the biological filter bed method.

Screening → Grit settlement → Sedimentation → Biological filter bed → Safe effluent

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Sludge

a) Describe what happens:

i) At the screening step

ii) To the liquid sewage in the biological filter bed.

b) State the importance of the sludge that settles from the primary sedimentation tanks.

c) Why is it important to treat sewage before it is discharged into a water body?

d) Describe each of the following methods of refuse (garbage) disposal:

i) Incineration

ii) Pulverisation

iii) Composing.

(7, 2, 5, 6 marks)

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9) State the roles played by each of the following institutions in a community:

a) Antenatal clinics

b) Prisons

c) Non-governmental organizations

d) Geriatric homes.

(7, 5, 5, 3 marks)