NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ INDEX NO. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SCHOOL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ SIGNATURE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DATE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

231/1

BIOLOGY

(THEORY)

PAPER 1

JULY, 2017

TIME: 2 HOURS

231/1

BIOLOGY

(THEORY)

PAPER 1

TIME: 2 HOURS

**INSTRUCTIONS TO CANDIDATES**

1. Write your name and index number in the spaces provided above.
2. Sign and write the date in the spaces provided above.
3. Answer **ALL** the questions in the spaces provided.
4. Additional pages **MUST** not be inserted.
5. Candidates may be penalized for false information and even wrong spellings of technical terms.
6. This paper consists of **7** printed pages.
7. Candidates should check to ensure that all pages are printed as indicated and no questions are missing.

**FOR OFFICIAL USE ONLY**

|  |  |  |
| --- | --- | --- |
| QUESTION | MAXIMUM SCORE | CANDIDATE’S SCORE |
| 1 − 31 | 80 |  |

1. Motor vehicles move, use energy and produce carbon (IV) oxide and water. Similar characteristics occur in living organisms yet motor vehicles are not classified as living. Explain. (3 marks)

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1. State **one** use for each of the following apparatus in the study of living organisms.
2. Pooter (1 mark)

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1. Pitfall trap (1 mark)

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1. State the functions of the following cell organelles:
2. Ribosomes (1 mark)

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1. Lysosomes (1 mark)

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1. State the functions of the following parts of a light microscope.
2. Fine adjustment knob (1 mark)

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1. Stage (1 mark)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Why is it recommended to keep the stage of the microscope dry? (1 mark)

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1. Using a microscope, a student counted 55 cells across a field of view whose diameter was 6000μm (micrometers). Calculate the average length of the cells. Show your working. (2 marks)

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1. An experiment was set up as shown below.



The set up was left for 30 minutes.

1. State the expected results. (1 mark)

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1. Explain your answer in (a) above. (3 marks)

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1. a) Distinguish between diffusion and active transport. (2 marks)

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b) State **one** role that is played by osmosis in,

i) Plants (1 mark)

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ii) Animals (1 mark)

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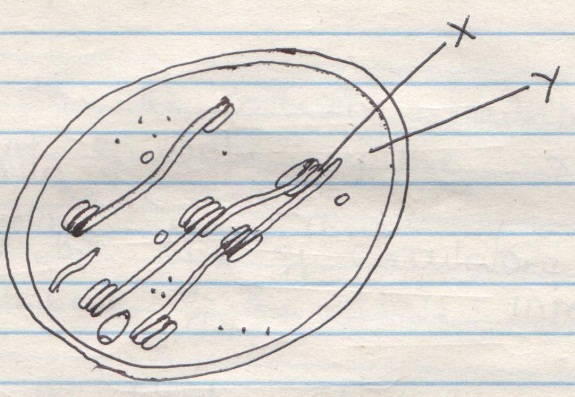
1. Name **two** mineral elements that are necessary in the synthesis of chlorophyll. (2 marks)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. a) State the functions of cristae in mitochondria. (1 mark)

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b) The diagram below represents a cell organelle.



**Y**

**X**

1. Name the part labelled Y. (1 mark)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. State the functions of the part labelled X. (1 mark)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Name the end products of the light stage in photosynthesis. (2 marks)

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1. a) State the functions of co-factors in cell metabolism. (1 mark)

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b) Give **one** example of a metallic co-factor. (1 mark)

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1. The action of ptyalin stops at the stomach. Explain. (1 mark)

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1. State **two** functions of carbohydrates in the human body. (2 marks)

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1. Name the tissues in plants responsible for:
2. Transport of water and mineral slats. (1 mark)

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1. Transport of carbohydrates. (1 mark)

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1. Primary growth. (1 mark)

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1. Explain how the following contribute to the movement of water up the xylem vessels. (2 marks)
2. Cohesion

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1. Adhesion

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. a) Name the type of circulatory system found in members of the class insecta. (1 mark)

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b) Name the blood vessel that transports blood from:

i) Small intestines to the liver (1 mark)

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ii) Lungs to the heart (1 mark)

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1. a) Name **one** defect of circulatory system in humans. (1 mark)

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b) State **two** ways in which the red blood cells are adapted to their functions. (2 marks)

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1. Why would carboxyhaemoglobin lead to death? (2 marks)

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1. State **four** ways in which respiratory surfaces are suited to their function. (4 marks)

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1. Name the causative agents for the following respiratory diseases.
2. Whooping cough (1 mark)

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1. Pneumonia (1 mark)

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1. Name the **three** end products of anaerobic respiration in plants. (3 marks)

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1. Give **two** factors that determine the amount of energy a human being requires in a day. (2 marks)

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1. Explain what happens when there is oxygen debt in human muscles. (3 marks)

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1. a) A person was found to pass out large volumes of dilute urine frequently.

i) Name the disease the person was suffering from. (1 mark)

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ii) Name the hormone that was deficient. (1 mark)

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1. What is the role of sweat in human body? (2 marks)

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1. Explain what happens to excess amino acids in the liver of humans. (3 marks)

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1. Explain why plants do not require specialized excretory organs. (4 marks)

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1. State **three** external differences between chilopoda and diplopoda. (3 marks)

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1. a) How are leaves of submerged plants adapted to photosynthesis? (2 marks)

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b) Name **two** disorders in human caused by gene mutation. (2 marks)

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1. a) State **two** functional differences between the rods and cones in the human eye. (2 marks)

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b) State **two** advantage of having an exoskeleton. (1 mark)

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