

Candidate's Name: .....

1 hour 40 minutes

Essay

[70 marks]

Answer **three** questions in **all**; **two** questions from Section A and the compulsory question in Section B.

Write your answers in **ink** in this booklet.

Large labelled diagrams should be used where they make an answer clearer. The names given for chosen species **must** be English or scientific and **not** vernacular.

Credit will be given for clarity of expression and orderly presentation of answers.

SECTION A

Answer **two** questions **only** from this section.

1. (a) (i) Explain the term *germination*.

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[3 marks]

(ii) List the **two** types of germination.

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[2 marks]

(iii) State **three** external conditions necessary for germination.

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[3 marks]

(b) State **two** differences between the **two** types of germination listed in 1(a)(ii).

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[2 marks]

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(c) Explain briefly the role of mutation in evolution.

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[3 marks]

(d) Place the following animals with their **appropriate** behavioural adaptation listed below.

Polar Bear, Monkey, Lizard, Bat.

(i) Aestivation: \_\_\_\_\_

(ii) Basking: \_\_\_\_\_

(iii) Territoriality: \_\_\_\_\_

(iv) Hibernation: \_\_\_\_\_

[4 marks]

SECTION B

Answer all the questions in this section.

(a) State **one** function **each** of the following parts of a light microscope:

(i) Eyepiece lens;

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[1 mark]

(ii) fine adjustment knob;

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[1 mark]

(iii) condenser;

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[1 mark]

(iv) stage;

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[1 mark]

(v) mirror.

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[1 mark]

(b) State **four** precautions that could be taken when using a light microscope.

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[4 marks]

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(c) Complete the table below:

| <i>Floral parts</i>  | <i>Term used to describe a collection of floral part</i> | <i>Essential or non-essential</i> | <i>Function of floral part</i> |
|----------------------|--|-----------------------------------|--------------------------------|
| Sepal                |  | non-essential                     |                                |
| Petal                |  |                                   |                                |
| Anther and filament  |  |                                   |                                |
| Stigma, style, ovary | Pistil   |                                   |                                |

[10 marks]

2. (a) State four modes of nutrition in plants.

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[4 marks]

(b) Outline the processes involved in the following phases of photosynthesis:

(i) light reaction phase;

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[4 marks]

(ii) dark reaction phase.

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[4 marks]

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(c) Write the balanced chemical equation for the light reaction phase of photosynthesis.

[4 marks]

(d) State two ways in which manufactured foods are utilized by plants.

[2 marks]

(e) Give two examples of carnivorous plants.

[2 marks]

3. (a) Explain briefly the following terms:

(i) ecology;

[2 marks]

(ii) ecosystem;

[2 marks]

(iii) biosphere.

[2 marks]

(b) (i) List two main components of an ecosystem.

[2 marks]

(ii) Explain each of the components listed in 3(b)(i).

[4 marks]

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(c) (i) State four characteristics of a tropical rainforest.

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(ii) State two adaptations of a mahogany tree to its forest habitat.

[4 marks]

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4 (a) (i) What is organic evolution?

[4 marks]

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(ii) List five evidences that support the Theories of evolution.

[2 marks]

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(b) (i) Explain briefly the Theory of use and disuse of body parts in evolution.

[5 marks]

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(ii) Name the Scientist that proposed the Theory of use and disuse of body parts.

[1 mark]

(iii) Give two examples of animals used by the Scientist named in 4(b)(ii) to support the Theory of use and disuse of body parts.

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[2 marks]

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(c) (i) What is *magnification*?

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[2 marks]

(ii) A student was provided with a *Tilapia* specimen of length 10 *cm*. The student made a drawing of the specimen of length 12 *cm*. Calculate the magnification of the drawing.

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[3 marks]

(d) Describe the structure of a *DNA* molecule.

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[6 marks]

(e) Name **five** structures similar in *Paramecium* and *Euglena*.

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[5 marks]

(f) (i) State **three** advantages of fish farming.

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[3 marks]

(ii) State **two** disadvantages of fish farming.

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[2 marks]