

231/1

— **BIOLOGY** —

**Paper 1**



**Apr. 2021 – 2 hours**

Name ..... Index Number .....

Candidate's Signature ..... Date .....

**Instructions to candidates**

- (a) Write your name and index number in the spaces provided above.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) Answer **all** the questions in the spaces provided in this booklet.
- (d) **This paper consists of 12 printed pages.**
- (e) **Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**
- (f) **Candidates should answer the questions in English.**

**For Examiner's Use Only**

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*Answer all the questions in the spaces provided.*

1. Name the taxonomic grouping that contains individuals with most similarities. (1 mark)

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2. Name the characteristic of living organisms shown by each of the following:

- (a) budding in yeast; (1 mark)

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- (b) enlargement of the eye pupil in dim light. (1 mark)

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3. Explain why there is no grass in most dense forests. (2 marks)

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4. State **one** structural difference between a cell wall and a cell membrane. (1 mark)

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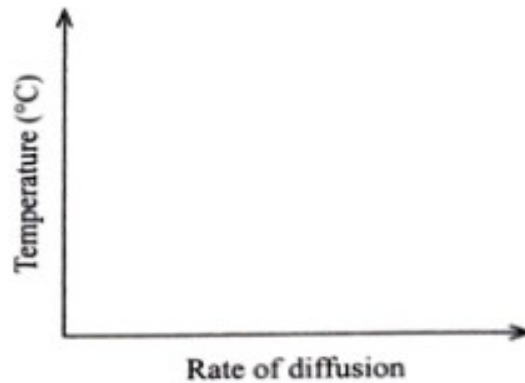
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5. The diagram below shows an organism in a certain Kingdom.



- (a) Name the Kingdom to which the organism belongs. (1 mark)  
 .....
- (b) State the mode of nutrition for the organism. (1 mark)  
 .....
- (c) (i) Name the part labelled E. (1 mark)  
 .....
- (ii) State **two** functions of the part labelled E. (2 marks)  
 .....  
 .....  
 .....
6. State the importance of a well developed blood capillary network in the alveoli. (1 mark)  
 .....  
 .....
7. Name the genetic disorder in humans that is characterised by inability of blood to clot. (1 mark)  
 .....

8. (a) Sketch a graph on the axis below showing how temperature affects the rate of diffusion. (1 mark)



- (b) Account for the shape of the sketch made in (a) above. (2 marks)

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9. (a) Explain why plants have lower respiratory rates compared to animals. (1 mark)

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- (b) State **two** situations in plants when the rate of respiration rises more than normal. (2 marks)

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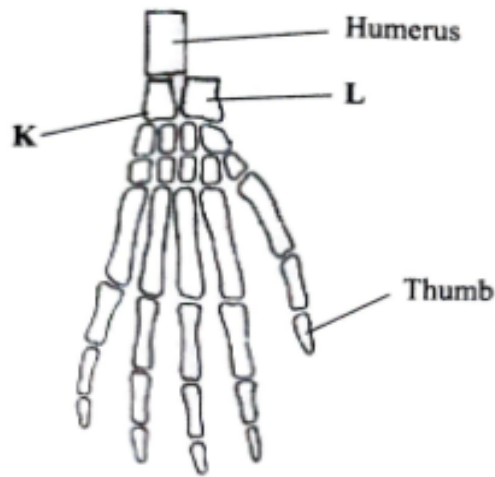
10. Explain why most plants growing in water-logged areas die before attaining maturity. (3 marks)

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11. The diagram below shows the plan of a pentadactyl limb.



Name the bones labelled **K** and **L**.

**K** (1 mark)

.....

**L** (1 mark)

.....

12. With reference to germination explain:

(a) the meaning of the term imbibition; (1 mark)

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.....

(b) why the dry mass of the endosperm decreases while that of the embryo increases. (2 marks)

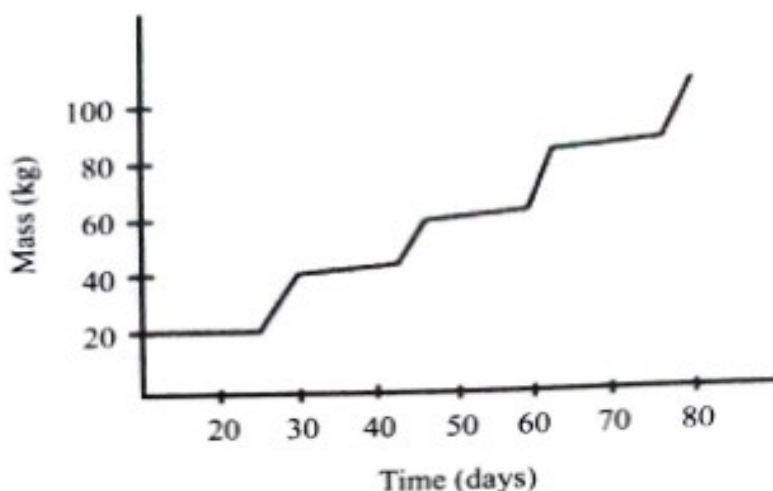
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13. State **two** characteristic features used to classify members of Class Coniferales. (2 marks)

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14. The graph below represents a growth curve in a certain Phylum.



- (a) Name the type of growth curve shown. (1 mark)

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- (b) Name the Phylum where members show the type of growth curve illustrated. (1 mark)

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15. (a) State **two** limitations of using fossil records in retracing evolutionary history of living organisms. (2 marks)

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- (b) Describe cell biology as an evidence of organic evolution. (3 marks)

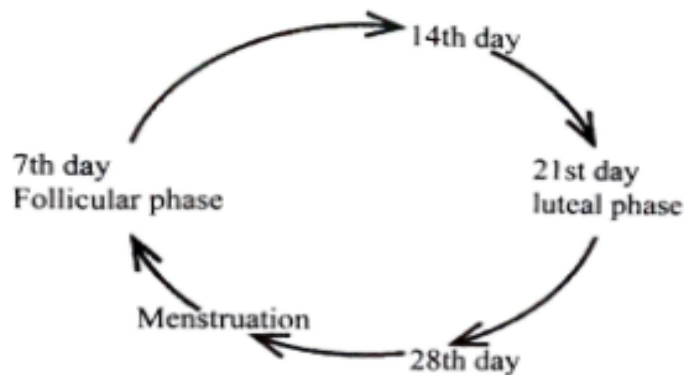
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16. The illustration below shows a summary of the main phases of the human menstrual cycle.



- (a) Name the process that takes place around the 14th day. (1 mark)
- .....
- (b) Name **two** hormones produced at the follicular phase. (2 marks)
- .....
- .....
- .....
- (c) Under which **two** conditions would the cycle be interrupted? (2 marks)
- .....
- .....
- .....
17. State **two** reasons why blood reaching the glomerulus is always under high pressure. (2 marks)
- .....
- .....
- .....

18. During a clinical laboratory test, some sugar was detected in an individual's sample of urine.

Name:

- (a) the hormone that was deficient in the patient; (1 mark)

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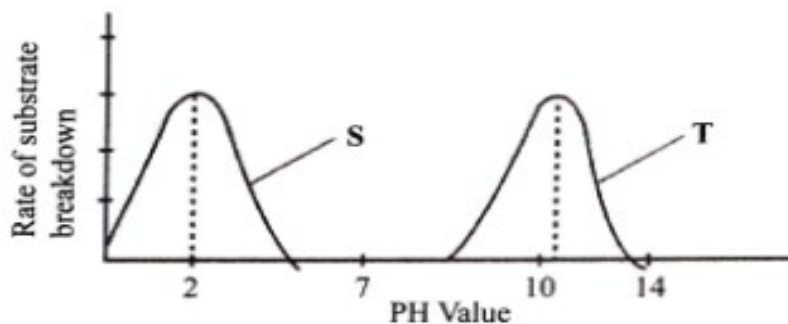
- (b) the gland that produces the hormone named in (a) above; (1 mark)

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- (c) the disease the individual was likely to be suffering from. (1 mark)

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19. The graph below illustrates the effect of pH on certain protein-digesting enzymes, S and T.



- (a) Name enzymes S and T.

S (1 mark)

.....

T (1 mark)

.....

- (b) (i) Name the part of the alimentary canal where enzyme T is likely to be found. (1 mark)

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- (ii) Explain your answer in b(i) above. (2 marks)

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20. Explain the biological significance of completing a dose of antibiotics. (3 marks)

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21. State **two** reasons why females with Turners' Syndrome are infertile. (2 marks)

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22. (a) Define the term "*field of view*" as used in microscopy. (1 mark)

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(b) State **two** functions of the body tube of a light microscope. (2 marks)

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(c) Give a reason why it is **not** advisable to use water in cleaning a microscope. (1 mark)

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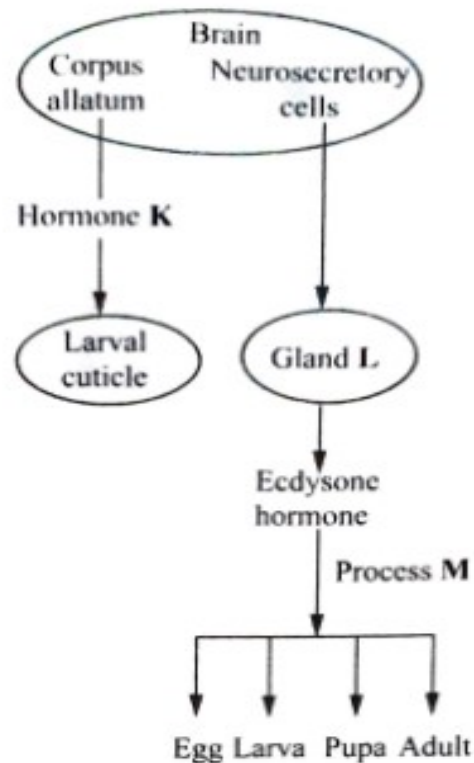
23. Explain the role of blood capillaries in thermoregulation. (2 marks)

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24. The illustration below shows the effect of hormones on insect growth and development.



(a) Name:

- (i) the hormone **K** (1 mark)

.....

- (ii) gland **L** that produces ecdysone hormone. (1 mark)

.....

(b) State the role of ecdysone hormone in the growth and development of insects. (1 mark)

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- (c) (i) Name process **M** (1 mark)

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- (ii) Account for the rapid increase in size of organisms immediately after moulting. (2 marks)

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25. (a) Complete the table below on the adaptations and functioning of some structures in a dicotyledonous stem. (2 marks)

| Part       | Adaptation |
|------------|------------|
| Cambium    |            |
| Parenchyma |            |

- (b) Explain why the leaf of a sisal plant has a thick and shiny cuticle. (2 marks)

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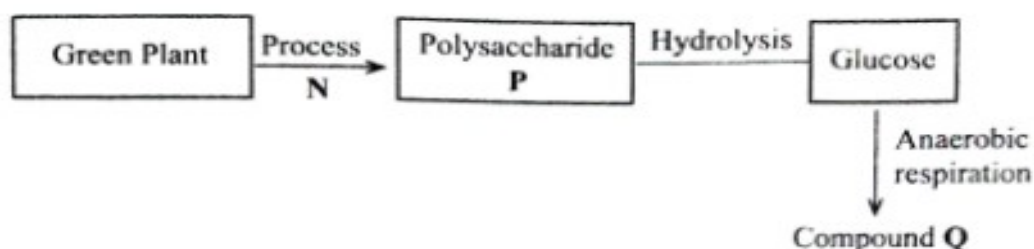
26. Explain why an individual with blood group AB can only donate blood to an individual with the same blood group. (2 marks)

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27. The diagram below illustrates a set of biological processes in a green plant.



- (a) Name:
- (i) process N (1 mark)
- .....
- (ii) polysaccharide P (1 mark)
- .....
- (b) State **two** conditions necessary for the formation of compound Q. (2 marks)
- .....
- .....
- .....
- (c) State **two** environmental conditions necessary for process N to take place. (2 marks)
- .....
- .....
- .....
- .....

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