

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**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

17	18	19	20	21	22	23	24	25	26	27

**Grand Total**

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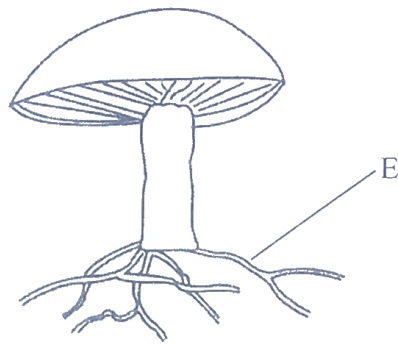
4. State **one** structural difference between a cell wall and a cell membrane. (1 mark)

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



(a) Name the Kingdom to which the organism belongs. (1 mark)

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(b) State the mode of nutrition for the organism. (1 mark)

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(c) (i) Name the part labelled **E**. (1 mark)

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(ii) State **two** functions of the part labelled **E**. (2 marks)

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6. State the importance of a well developed blood capillary network in the alveoli. (1 mark)

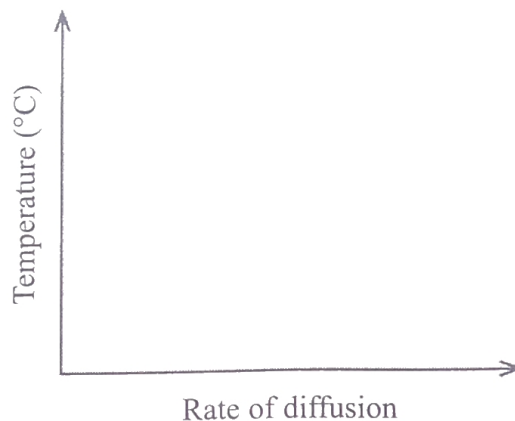
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7. Name the genetic disorder in humans that is characterised by inability of blood to clot. (1 mark)

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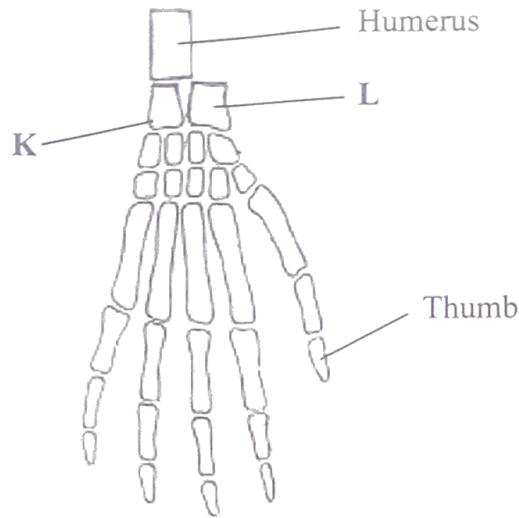
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11. The diagram below shows the plan of a pentadactyl limb.



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

**K** (1 mark)

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**L** (1 mark)

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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)

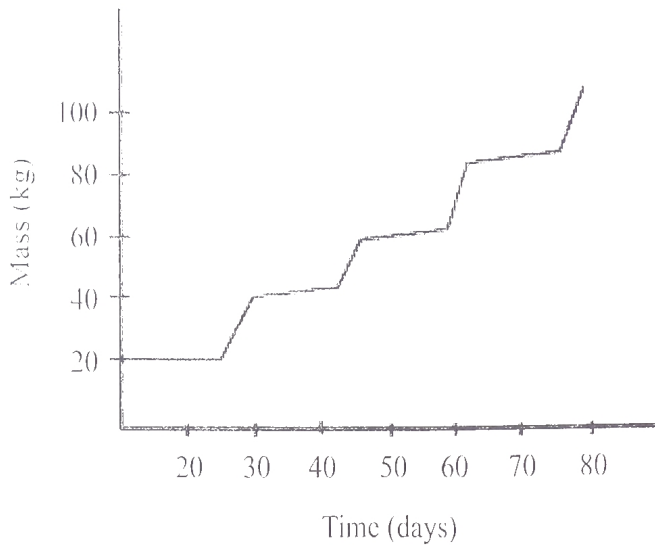
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13. State **two** characteristic features used to classify members of Class Coniferales. (2 marks)

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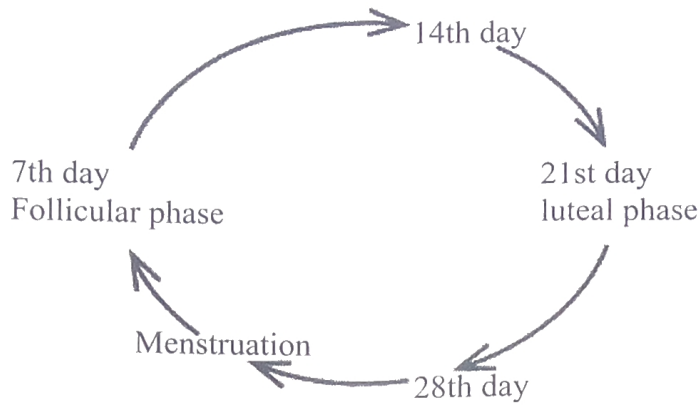
15. (a) State **two** limitations of using fossil records in retracing evolutionary history of living organisms. (2 marks)

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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)

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(b) Name **two** hormones produced at the follicular phase. (2 marks)

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(c) Under which **two** conditions would the cycle be interrupted? (2 marks)

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17. State **two** reasons why blood reaching the glomerulus is always under high pressure. (2 marks)

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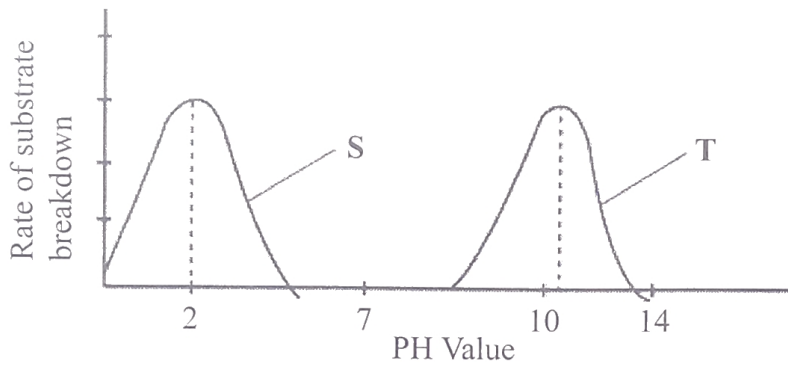
(b) the gland that produces the hormone named in (a) above; (1 mark)

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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)

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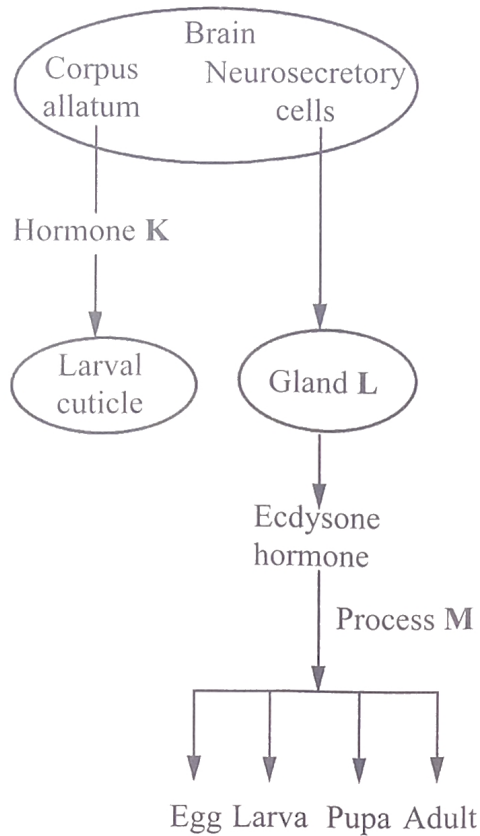
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24. The illustration below shows the effect of hormones on insect growth and development.



(a) Name:

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

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

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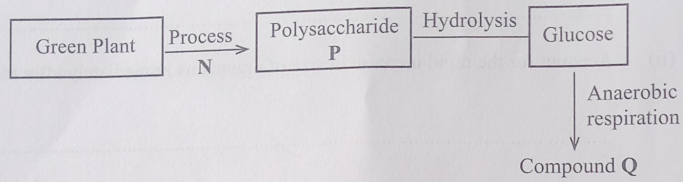
26. Explain why an individual with blood group AB can only donate blood to an individual with the same blood group. (2 marks)

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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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