

The City School

Unified Mid-Year Examinations

2018 - 2019

Class 11



SCHOOL NAME

INDEX NUMBER

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DATE

BIOLOGY

Paper 2 Theory

5090/22

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your School name, Index number and Date in the spaces provided.

Write in dark blue or black pen.

You may use a pencil for any diagrams or graphs.

Do not use paper clips, glue or correction fluid.

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided on the Question Paper.

Section B

Answer **both** questions in this section.

Write your answers in the spaces provided on the Question Paper.

Section C

Answer **either** question 8 or question 9.

Write your answers in the spaces provided on the Question Paper.

You are advised to spend no longer than one hour on Section A.

Electronic calculators may be used.

You may lose marks if you do not show your working or if you do not use appropriate units.

The number of marks is given in brackets [] at the end of each question or part question.

Invigilated By: _____

Checked By: _____

Marks Talled By: _____

This document consists of 16 printed pages.

Section A

Answer all the questions in this section.

- 1 Fig. 1.1 shows a section through a plant organ with a very small pipette (micropipette) inserted into tissue A.

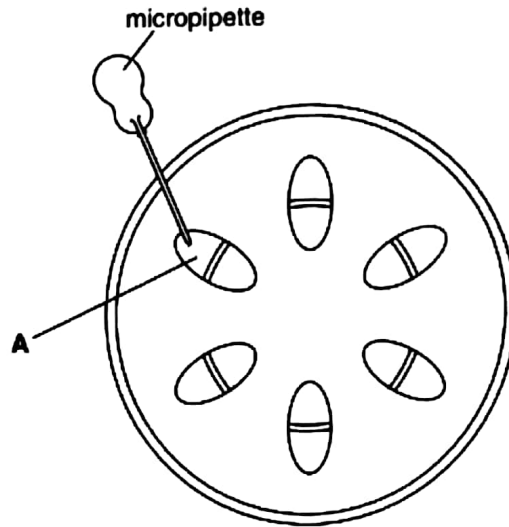


Fig 1.1

- (a) (i) Name the plant organ shown in Fig. 1.1.

..... [1]

- (ii) Name the tissue labelled A.

..... [1]

- (b) The micropipette is used to take samples from tissue A at regular intervals over a 24-hour period. These samples are then analysed for their content. Explain how this might provide information about the rate of photosynthesis in the plant.

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..... [4]

2 (a) At puberty, hormones are produced that are responsible for the development of secondary sexual characteristics.

(i) Name one secondary sexual characteristic in males.

..... [1]

(ii) Name the hormone responsible for the development of secondary sexual characteristics in males.

..... [1]

(iii) Name the organs that produce this hormone.

..... [1]

(b) Fig. 2.1 shows the concentrations in the blood of two hormones, F and G, involved in a woman's menstrual cycle.

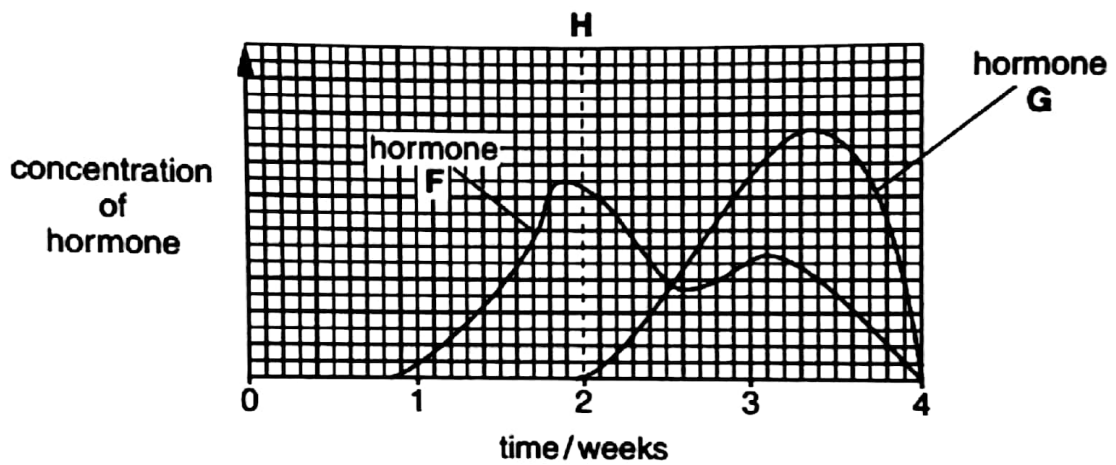


Fig 2.1

(i) Name the hormones F and G.

F

G

[2]

(ii) State what occurs at time H.

..... [1]

(c) Fig. 2.2 shows the thickness of the same woman's uterus lining over a 4-week period.

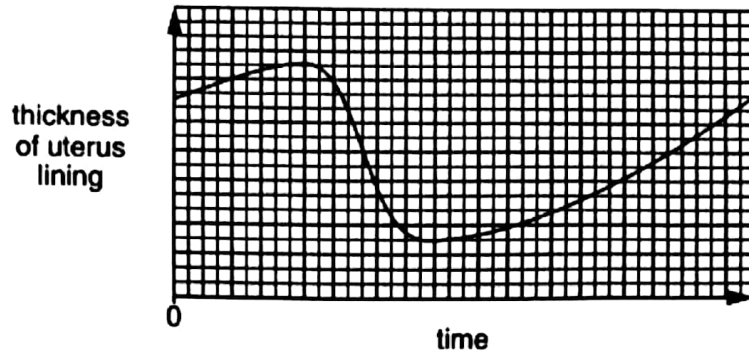


Fig.2.2

The graph shown in Fig. 2.1 does not begin at the same time as the cycle shown in Fig. 2.2.

Indicate on Fig. 2.2, with a line labelled J, the stage shown by line H on Fig. 2.1, and explain your reason for choosing this point on the graph.

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..... [4]

[Total: 10]

- 3 (a) Fig. 3.1 shows how pollination takes place in two different species of plant, species P and species Q.

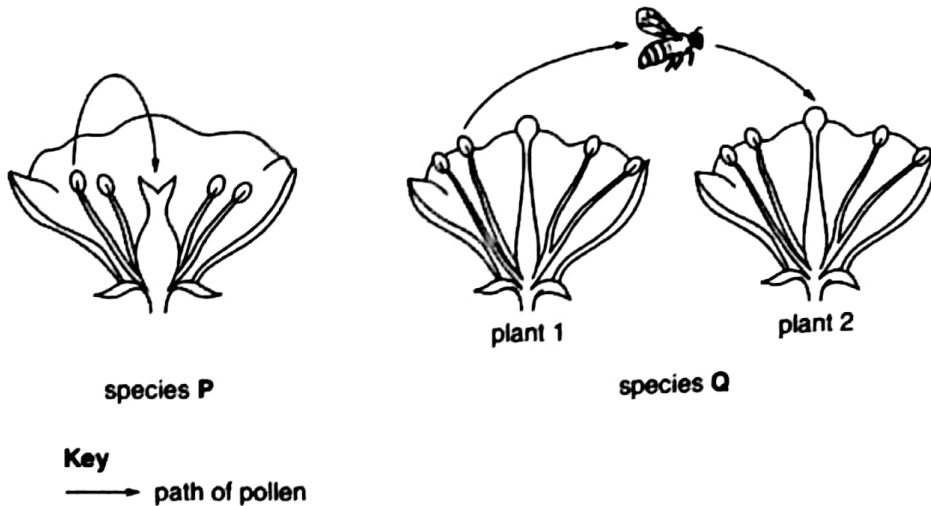


Fig 3.1

- (i) Using the information in Fig. 3.1, suggest and explain how each of these species of plant is pollinated.

species P

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species Q

.....
[4]

- (ii) Suggest **two** ways in which a flower from a plant of species Q in Fig. 3.1 may be adapted to increase the likelihood of pollination taking place.

1.
 2.[2]

- (b) State why species Q shows more variation in its phenotype than species P.

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 [1]

(c) Describe the events that take place in a flower after pollination until fertilisation has taken place.

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..... [3]

[Total: 10]

4 Fig. 4.1 shows a large jar in which plants are growing.

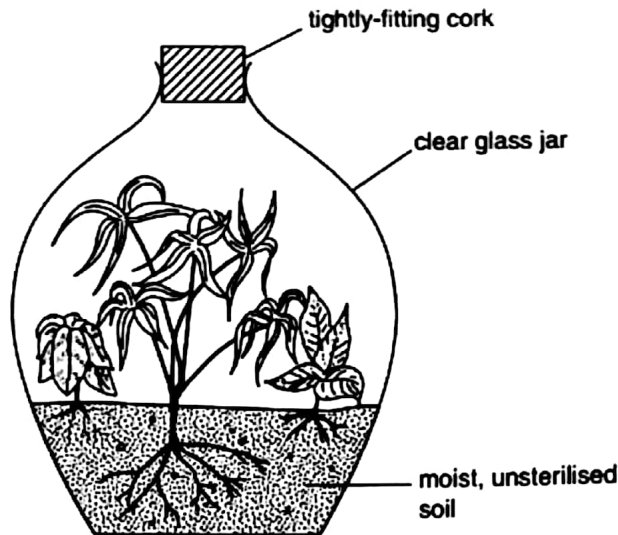


Fig 4.1

This jar provides an environment in which plants can live for many months without adding water or removing the tightly-fitting cork to allow air to enter.

(a) State the reason for placing the jar where it can receive a supply of sunlight.

..... [1]

(b) Suggest why the plants in the jar show only very limited growth compared with similar plants growing under natural conditions.

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..... [3]

(c) The cork prevents atmospheric air from entering the jar. Explain how the plants are able to remain alive without a continuous supply of fresh air.

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..... [4]

(d) Explain why no water needs to be added to the jar.

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..... [3]

[Total: 11]

5 Enzyme Q is active in the human alimentary canal. Fig. 5.1 shows the effect of pH on the rate of reaction of enzyme Q.

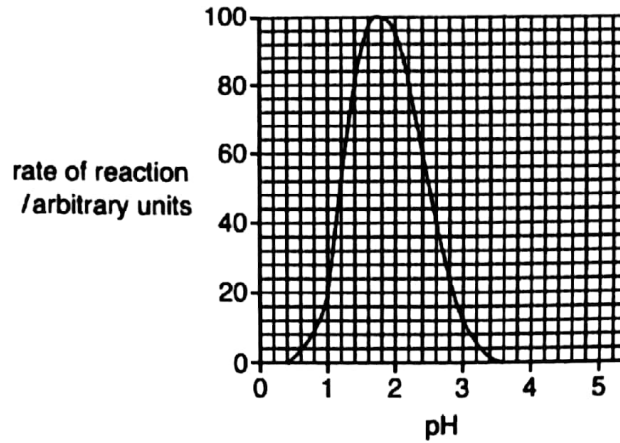


Fig 5.1

(a) (i) Use the information in Fig. 5.1 to name the region of the alimentary canal where enzyme Q is active.

..... [1]

(ii) Use your knowledge of the 'lock and key' hypothesis of enzyme action to explain why enzyme Q is active only in this region of the alimentary canal and not in any other region.

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(b) All enzymes contain carbon. List **three** other chemical elements that must be present in each molecule of an enzyme.

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2

3 [3]

[Total: 09]

Section B

Answer **both** questions in this section.

- 6 Fig. 6.1 shows a structure found in part of the alimentary canal.

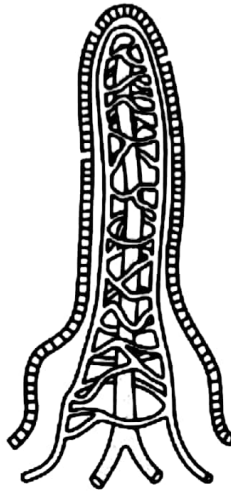


Fig 6.1

- (a) Name the structure shown in Fig. 6.1 and state the part of the alimentary canal in which it is found.

name of structure

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location in alimentary canal

..... [2]

- (b) Explain the ways in which this structure is adapted to enable it to carry out its function.

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7 (a) State where DNA is found and describe its importance in living organisms.

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(b) Describe the named diseases caused by mutation.

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..... [3]

(c) Explain, with the use of a genetic diagram, how a child may be born with a blood group different from that of either parent.

[4]

[Total: 10]

Section C

Answer either question 8 or question 9.

8 (a) Outline the sequence of events that take place in the body when a person breathes out.

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..... [5]

(b) State and explain the **similarities** and **differences** between air breathed in and air breathed out.

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[Total: 10]

9 (a) Describe and explain how microorganisms are used to produce a hormone commercially.

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(b) State the advantages of obtaining hormones by this method.

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..... [3]

[Total:10]