The City School

Unified Mid-Year Examinations
2018 - 2019
Class 11

SCHOOL NAME	
INDEX NUMBER	
DATE	

BIOLOGY **5090/62**
Paper 6 Alternative to Practical **1 hour**

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.

Answer **all** questions.
Write your answers in the spaces provided on the Question Paper.

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

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

Invigilated By: _____ Checked By: _____ Marks Tallied By: _____

This document consists of **8** printed pages.

1 Warm blooded animals need to maintain a constant internal body temperature.
In cold weather some of these animals crowd together in groups. Some students used test-tubes containing hot water to represent animals in an investigation into the loss of heat from animals' bodies. One test-tube, **A**, represented one animal on its own, as shown in Fig. 1.1.Another test-tube, **B**, represented an animal surrounded by seven similar animals in a group, as shown in Fig. 1.2.Test-tube **C** represented one of the outer animals in the group, as shown in Fig. 1.2.

Fig. 1.1

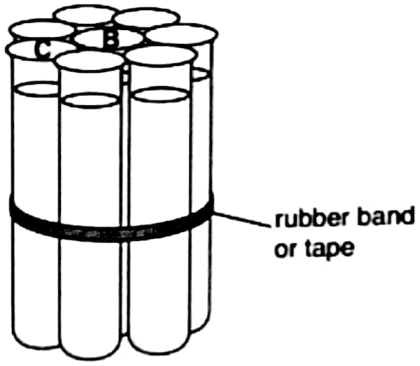


Fig. 1.2

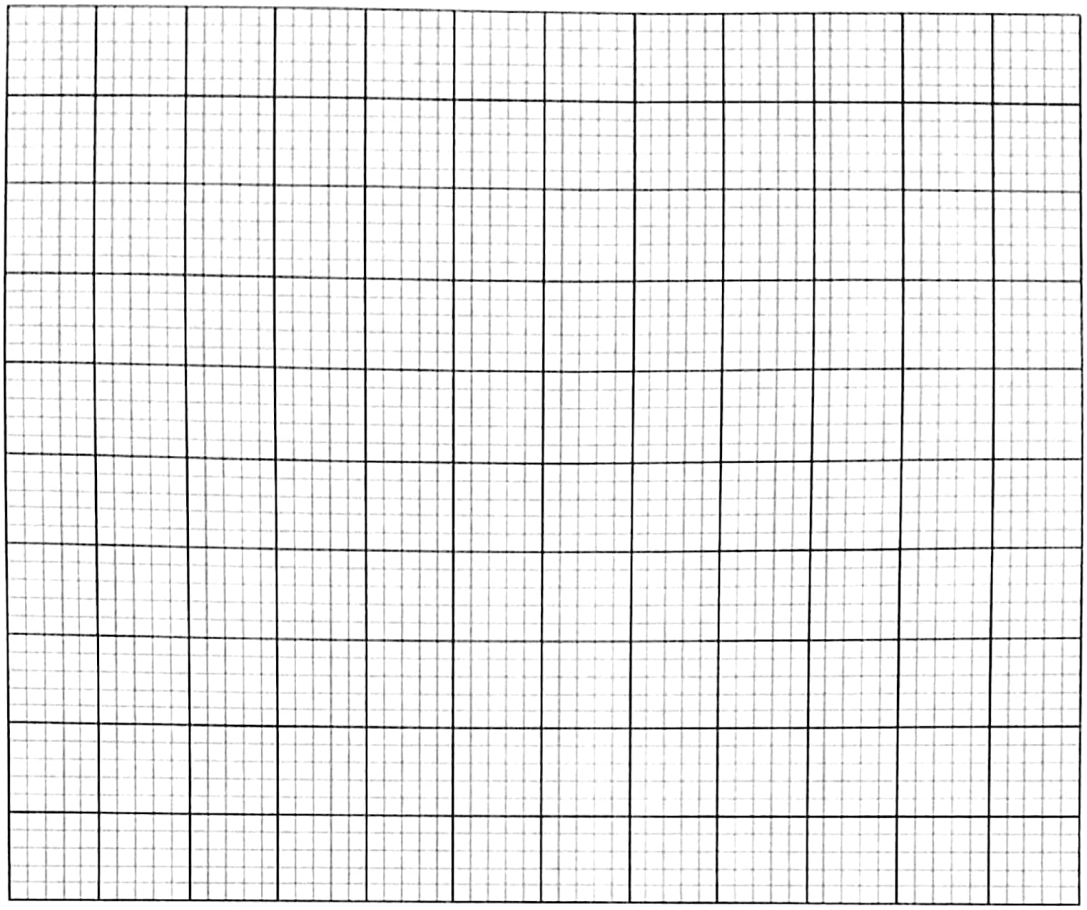
Fig 1.1

All nine test-tubes were filled with water at 70 °C. The temperature of the water in test-tubes **A**, **B** and **C** was measured when the tubes were filled and then every two minutes for a total of ten minutes.
The results are shown in Table 1.1.

Table 1.1

time/minutes	temperature/°C		
	tube **A**	tube **B**	tube **C**
0	70	69	68
2	64	69	66
4	54	68	65
6	48	68	64
8	44	67	62
10	37	67	60

(a) (i) On the grid below, plot the results for the **three** test-tubes **A**, **B** and **C** on the same axes.



[6]

(ii) Describe and compare the temperature changes in each of the **three** test-tubes.

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..... **[3]**

(iii) Suggest **and** explain **two** ways to improve this method to make the results more reliable.

Improvement 1 .....

.....

Explanation .....

.....

.....

Improvement 2 .....

.....

Explanation .....

..... [4]

(b) (i) State which test-tube represents the animal that finds it easiest to maintain a constant body temperature.

..... [1]

(ii) Suggest **how** animals crowding together in a group can help them to maintain body temperature in cold weather.

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..... [2]

[Total: 16]

2 **(a)** In Table 2.1, the statements concerning food tests may be true or false (untrue). Indicate in the spaces provided, those that are true (✓) or those that are false (✗).

Table 2.1

statement	test for			
	starch	reducing sugar	protein	fat
heating is required				
when test solution added contents of test-tube are blue				
the test is completed by the addition of water				
positive result of test is contents turning black				
the test can be carried out on a solution of the test material in water				
the material being tested is a carbohydrate				

[6]

(b) In one of these tests a green colour might be seen at some stage, if the final result is green, what would this indicate?

..... [1]

[Total: 07]

3 Fig. 3.1 shows a germinating bean seed.

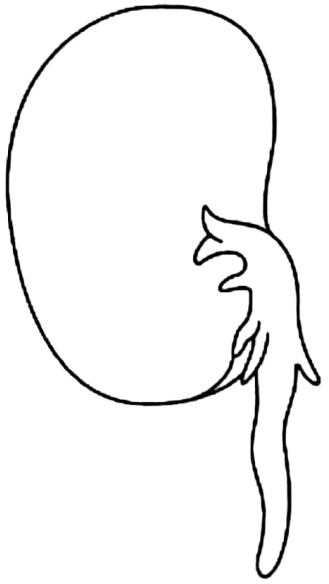

Fig 3.1

(a) Describe how you would demonstrate that the seed contains:

(i) starch

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(ii) protein

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..... [4]

(b) **(i)** Explain how the protein is taken from the store in the seed to where it is needed for growth.

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.....

(ii) Draw arrows on Fig. 3.1 to show the direction of this movement. [4]

(c) Fig. 3.2 shows a plant that is able to grow in soil that is short of nitrates, because it can produce protein in an unusual way.

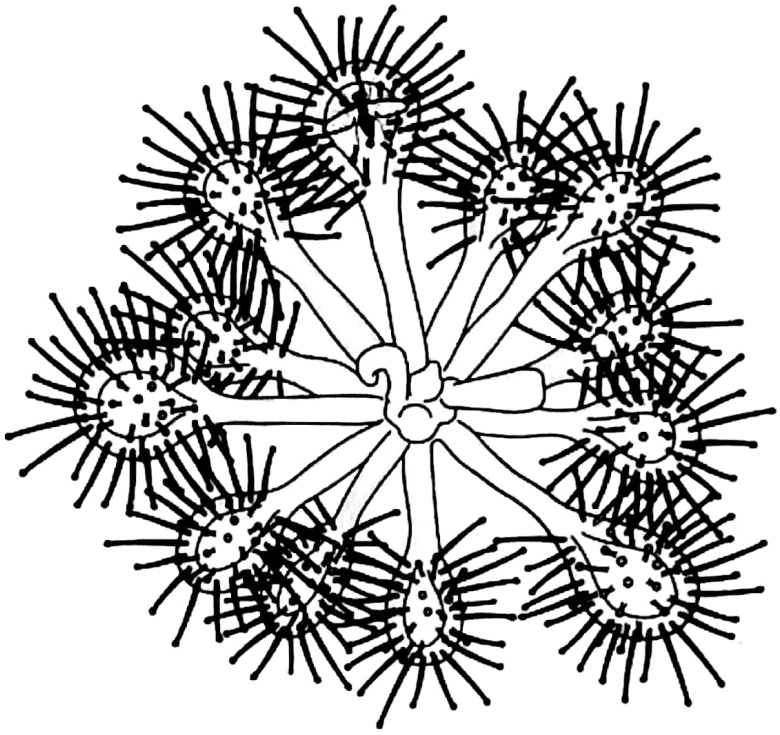

Fig 3.2

(i) The leaves attract insects.
(ii) The insects become stuck to the leaves.
(iii) Secretion of enzymes takes place from glands on the leaf.

Suggest how this plant produces protein from the trapped insects.

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..... [3]

(d) (i) State how nitrates are of benefit to green plants.

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..... [2]

(ii) Using apparatus like that shown in Fig. 3.3, outline how you could show the effect of nitrates on plant growth.

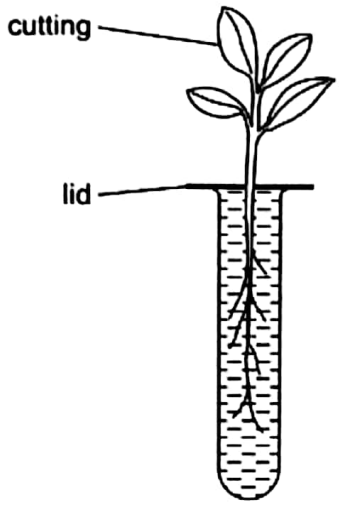

Fig 3.3

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..... [4]

[Total: 17]