

**2009 – CE
BIO**

PAPER 1

H.K.C.E.

MOCK EXAMINATION 2009

BIOLOGY PAPER 1

Question-Answer Book

(1 3/4 hours)

This paper must be answer in English

1. Write your Candidate Number, Centre Number and Seat number in the spaces provided on this cover.
2. This paper consists of TWO sections, A and B. Section A carries 58 marks, of which 4 marks are awarded for effective communication. Section B carries 38 marks, of which 2 marks are awarded for effective communication.
3. Attempt ALL questions in Section A, and any TWO questions in Section B. Write your answers in the spaces provided in this Question-Answer Book. Supplementary answer sheets will be supplied on request. Write your Candidate Number on each sheet and fasten them with string inside this book.
4. Write the question numbers of the questions you have attempted in Section B in the spaces provided on this cover.
5. The diagrams in this paper are not necessarily drawn to scale.

Candidate Number					
Centre Number					
Seat Number					

	Marker's Use only	Examiner's Use only
	Marker No.	Examiner No.
Section A	Marks	Marks
Question No.		
1		
2		
3		
4		
5		
6		
7		
Total		

Checker's Use only	SECTION A TOTAL		
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Section B	Marks	Marks
Question No.*		
Section B Total		

**To be filled in by the candidate.*

Checker's Use only	SECTION B TOTAL		
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Checker No.	
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SECTION A
Answer ALL questions in this section.

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1. Read through the following account of photosynthesis, then write on the dotted lines the most appropriate word or words to complete the account.

Photosynthesis is a type of autotrophic nutrition, involving the synthesis of organic molecules from inorganic materials. The process involves two types of reactions, light reaction and dark reaction.

In the light reaction, light energy is absorbed by located inside the;and produced .

In the dark reaction, carbon dioxide and the product of light reaction, results in the formation of This compound can be converted to for storage.

(3 marks)

Q.1

2. Some fresh fruit and their juices can be used as meat tenderizers, which make meat softer. An investigation was carried out to study the effect of fresh and boiled fruit juices on gelatin, which is made up of protein.

6 test tubes were set up, each containing a gelatin cube and one type of fruit juice. The size of the gelatin cube and the volume of juice used in all test tubes were the same. All six tubes were allowed to stand at 25°C without shaking.

The table below shows the time taken for the gelatin cubes to disappear completely in different test tubes :

Type of fruit juice	Time taken for the gelatin cube to disappear completely (day)	
	Fresh juice	Juice boiled for 10 minutes
Papaya	5	The cubes did not disappear after 10 days
Kiwi	3	
Pineapple	1	

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- (a) (i) Suggest a possible explanation for the disappearance of the gelatin cubes after standing in the fresh fruit juices for a few days. (2 marks)

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- (ii) Based on your answer in (i), give a reason why the fruit juices can serve as meat tenderizers. (1 mark)

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- (iii) Which type fruit juice would make the best meat tenderizer ? (1 mark)

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- (b) How do the results obtained suggest that the action of an enzyme was involved in the disappearance of the gelatin cubes ? (2 marks)

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- (c) For the same volume of juices and gelatin used, suggest *ONE* way to shorten the time taken for the complete disappearance of the gelatin cubes. (1 mark)

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- (d) From the nutritional point of view, explain why it is better to eat a fruit, instead of drinking its juice only. (3 marks)

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Total : 10 marks

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Q.2

3. Many people are very concerned about their body weight. Though some are not overweight, they use various methods to lose weight. The table below shows two of these slimming methods and their effects :

Slimming method		Effect
A	Drinking slimming tea which contains substances - Senna.	Senna leads to diarrhoea (the production of watery faeces).
B	Taking certain stimulant drugs.	Such stimulants suppress the appetite and increase the metabolic rate of the body.

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(a) Suggest **TWO** undesirable side effects on the body of using method A for slimming.

(2 marks)

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(b) (i) Explain how method B can lead to loss of body weight.

(4 marks)

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(ii) Give **ONE** harmful effect of taking stimulants on the body.

(1 mark)

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(iii) In order to lose weight, some people avoid taking fat in their diet, but they may not know that fat is important to our body. List **TWO** functions of fat in our body.

(2 marks)

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Total : 9 marks

Q.3

4. A couple gave birth to three boys – A, B and C . Two of them were identical twins. The table below lists some characters shown by the three boys :

Character	A	B	C
Weight (at the age of 10)	40 kg	44 kg	44 kg
Ear lobed	Present	Absent	Present
IQ	111	119	123
Colour blind	No	Colour blind	No

(a) Which two boys were identical twins ? Explain your answer ?

(2 marks)

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(b) If the couples are presence of ear lobe, deduce, with reasons, the allele for ear lobe is dominant.

(Mark will not be awarded to genetic diagrams.)

(4 marks)

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(c) What is the probability of the couple to get son in the 4th child?

(1 mark)

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Total : 7 marks

Q.4

5. X and Y are healthy 20-year-old young men. They have similar height and body weight. Diagrams A and B below represent one complete cardiac cycle of the two men at rest.

Diagram A : X

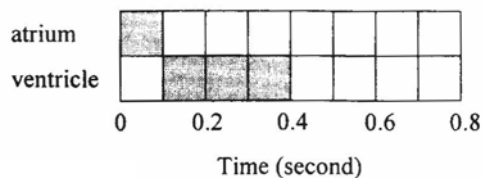
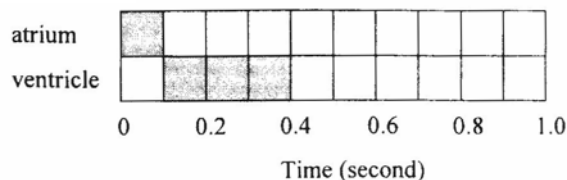


Diagram B : Y



Key : systole diastole

(a) What is the rate of heart beat of

(1) X, (2) Y ?

(2 marks)

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(b) If the volume of blood leaving the heart in one minute is 6000mL for both X and Y, what is the volume of blood pumped out of the heart in each beat for

(1) X, (2) Y ?

(2 marks)

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(c) Based on your answer in (ii), deduce with reasons which man (X or Y) is a trained runner.

(3 marks)

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Total : 7 marks

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Q.5

6. The table below shows some domestic wastes. In Hong Kong, such waste can be disposed of by burning.

Domestic waste
Polystyrene bowl
Supermarket's bag
Newspaper
Soft drink can
Food residue

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(a) State and explain one undesirable effect of the excessive use of papers on the natural environment.

(4 marks)

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(b) State and explain one harmful effect of burning of polystyrene bowls on human health.

(2 marks)

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(c) Which above wastes are classified as non-degradable pollutant ?

(1 mark)

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(d) In some buildings, wastes collection are divided into 『yellow for aluminium can』, 『brown for plastic bottle』 and 『blue for waste paper』. Why doing so is environmentally friendly ?

(3 marks)

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(e) Describe one way to recycling the food residue.

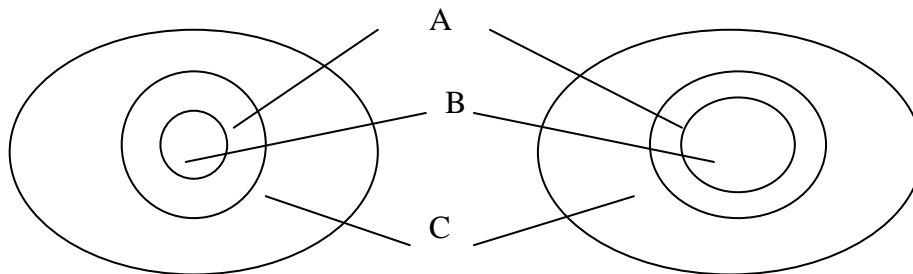
(2 marks)

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Total : 12 marks

Q.6

7. The photographs below show an eye exposed to two different light intensities :



Photograph I

Photograph II

(a) Which photograph shows the appearance of the eye under bright light ?

(1 mark)

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(b) Describe the neural pathway resulting in the change of the size of B under bright light :

(4 marks)

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(c) What is the significance of this change ?

(1 mark)

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Total : 6 marks

Q.7

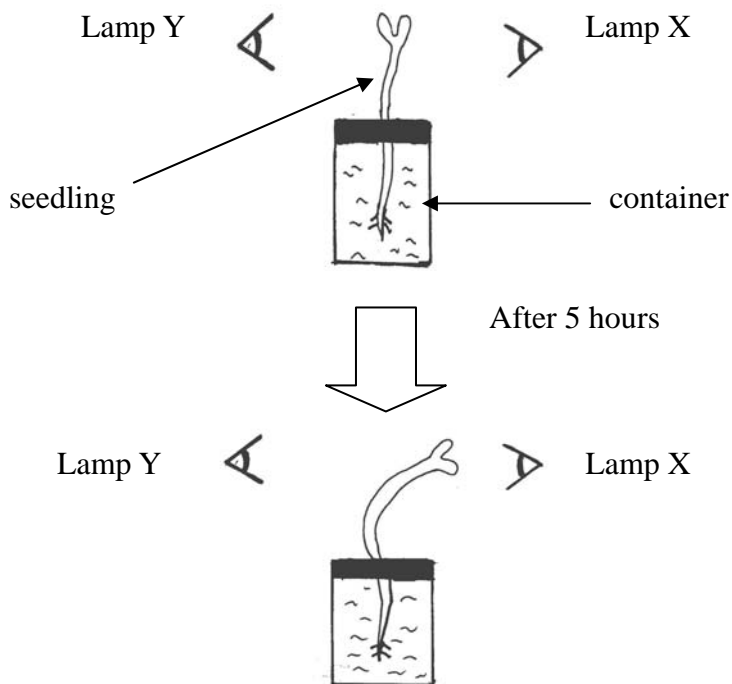
END OF SECTION A

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SECTION B
Answer any TWO questions

All questions in this section carry equal marks.

8. (a) In a growth response experiment, a seedling was illuminated by two lamps, X and Y. Lamp X is higher light intensity than lamp Y. It took 5 hours for the seedling to curve as shown below :



- (i) Explain why it is better in using seedling instead of potted plant for the investigation ?

(2 marks)

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- (ii) What conclusion can be drawn from the experiment?

(1 mark)

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(iii) Explain the curvature of the seedling observed in the set-up on a hormonal basis.

(4 marks)

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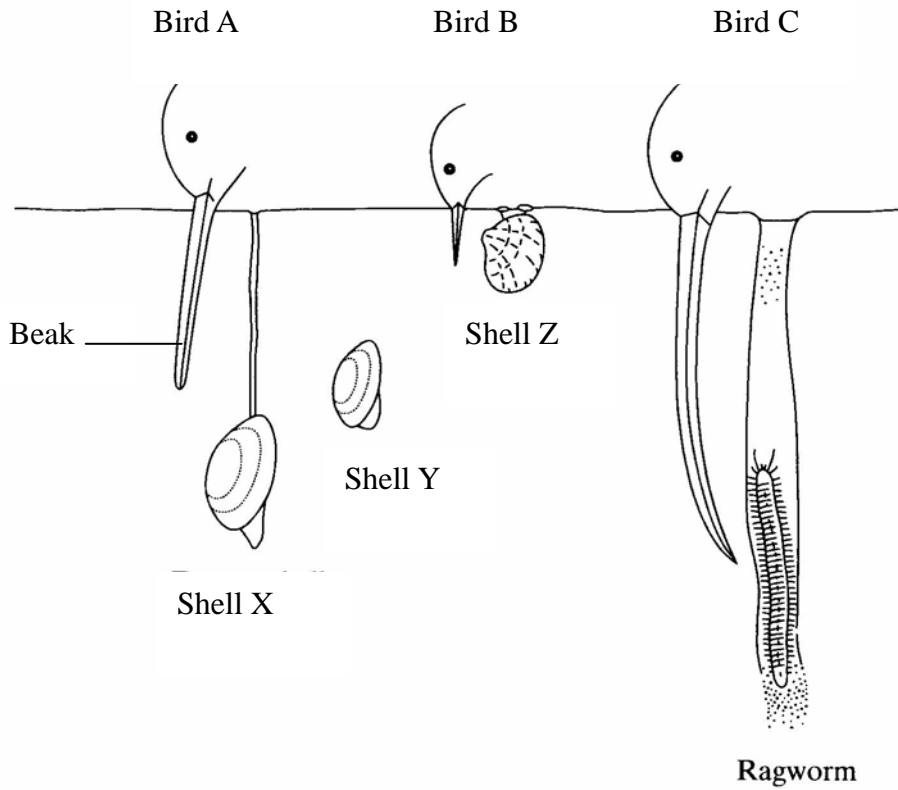
(iv) Draw a diagram to show how set-up could be modified to demonstrate the relative effects of gravity and light on the growth response of the seedling.

(2 marks)

Total : 9 marks

8. (b) Some birds feed on animals found in mud in estuaries. The drawing shows the heads of three species of these birds and their prey.

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(i) Use the information in the drawing to explain how interspecific competition between the birds is reduced.

(3 marks)

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(ii) Explain how competition might have played a part in the evolution of the long curved beak of the bird C.

(4 marks)

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(iii) Mud higher up the shore receives fresh water draining from the land. Ragworms are able to survive in this mud because they can tolerate the absorption of water into their tissues. Explain what causes a ragworm to absorb water when higher up the shore.

(2 marks)

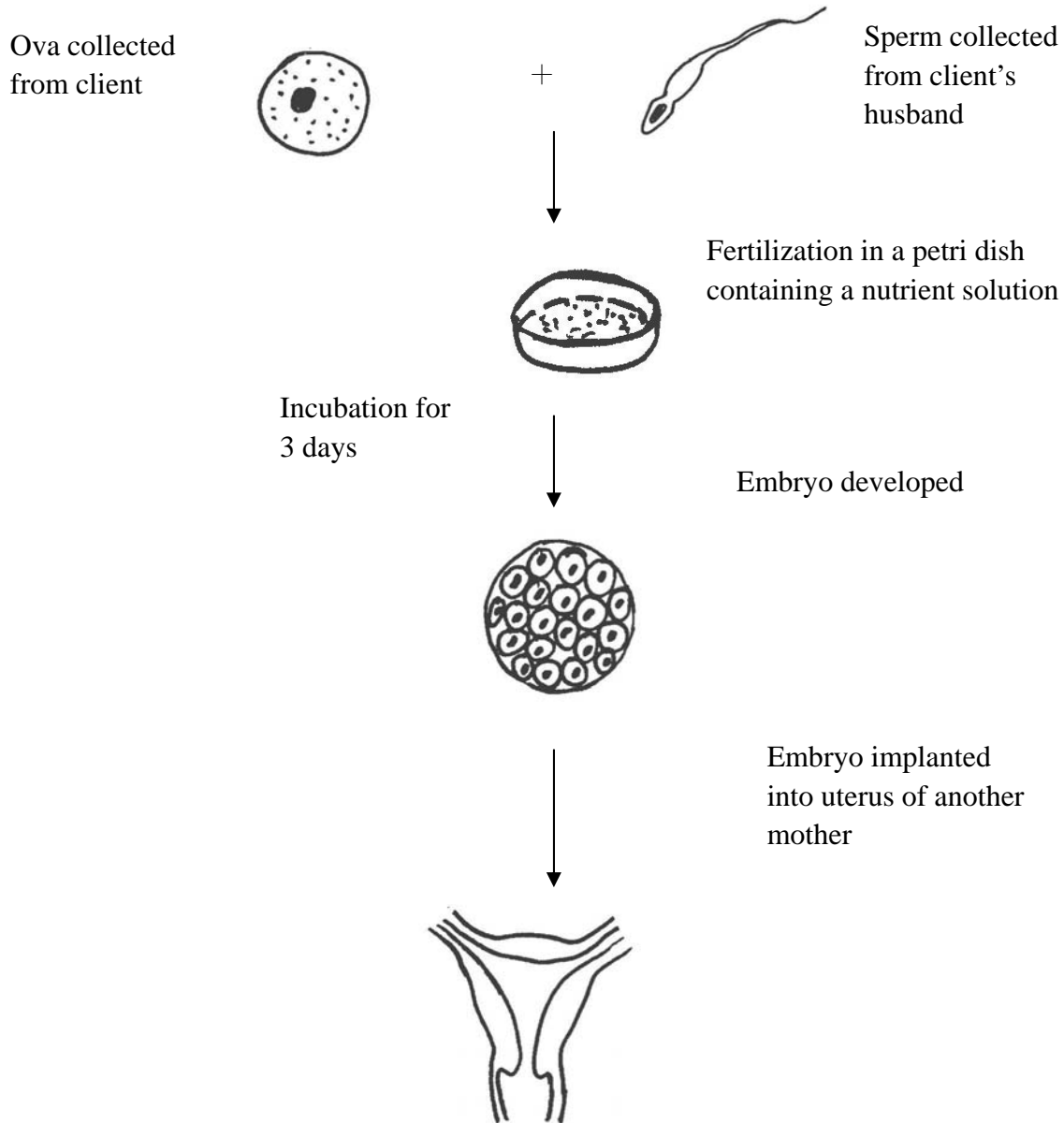
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Total : 9 marks

Q.8

9. (a) Some women have some difficulties in getting pregnancy even though they can produce ova. The diagram below outlines a possible process which can help women to have own child :

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(i) With respect to the site of fertilization, how does the process shown in the diagram differ from normal pregnancy ?

(2 marks)

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(ii) Suggest two social/ethical issues that may arise from the use of the process shown in the diagram.

(2 marks)

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(iii) Besides abnormalities of the uterus, suggest one structural defect in the reproductive system of women that would lead to infertility.

(1 mark)

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(iv) Explain why the petri dish containing a nutrient solution is necessary ?

(2 marks)

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(v) At which period of menstrual cycle, is the most suitable time for the embryo implantation ? Explain your answer.

(3 marks)

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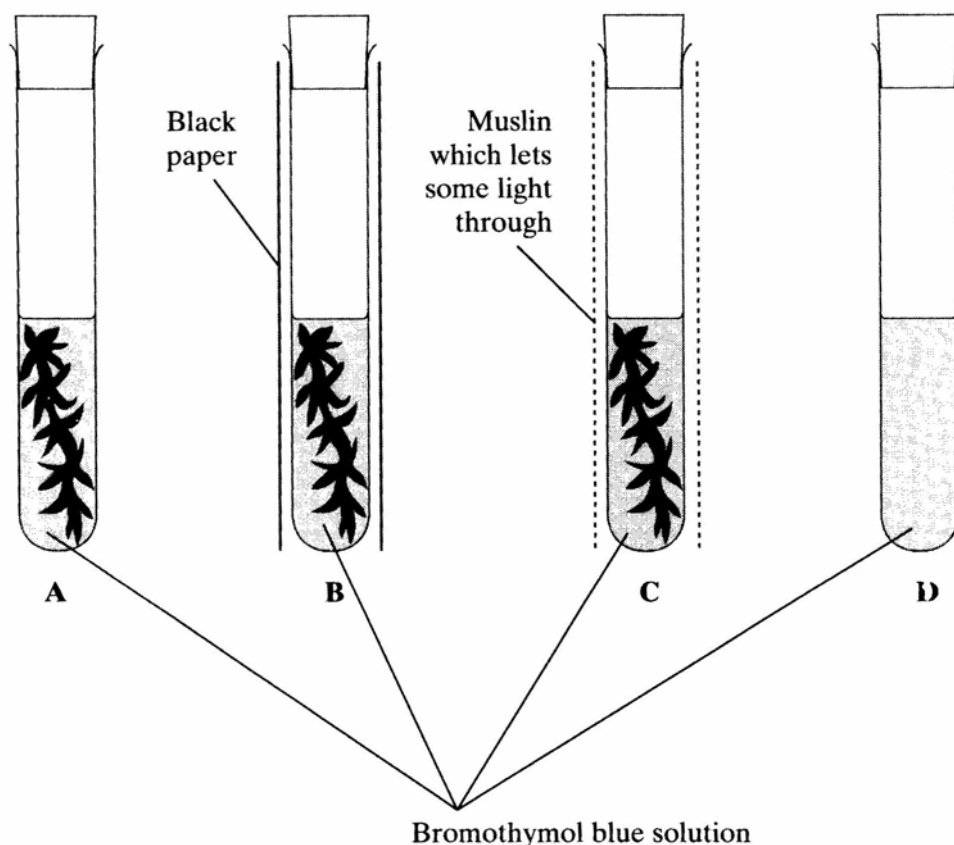
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- 9 (b) Gas exchange in an aquatic plant was investigated by placing shoots in tube containing pH indicator solution. pH indicator is yellow below pH 6, green between 6.1 and 7.5, and blue at pH 7.6 and above. Into each of four tubes A, B, C and D, 10 cm³ of pH indicator solution were placed. Each tube was closed with a bung and left for 10 minutes. Similar-sized shoots of an aquatic plant were then placed into each of tube A, B and C. The tubes were treated as shown in the diagram.

They were then placed at equal distances from a 60 watt lamp and left for one hour.



The table shows the initial and final colours of the indicator in the four tubes.

Tube	Treatment	Initial colour of indicator	Colour of the indicator after one hour
A	Uncovered	Green	Blue
B	Covered with black paper	Green	Yellow
C	Covered with muslin	Green	Green
D	Uncovered	Green	Green

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(i) Explain the results for

Tube A

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Tube B

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Tube C

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(6 marks)

(ii) Explain how the results from tube D help to confirm that the explanations for the other tubes are valid.

(1 mark)

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(iii) Explain why all the tubes were placed the same distance from the lamp.

(1 mark)

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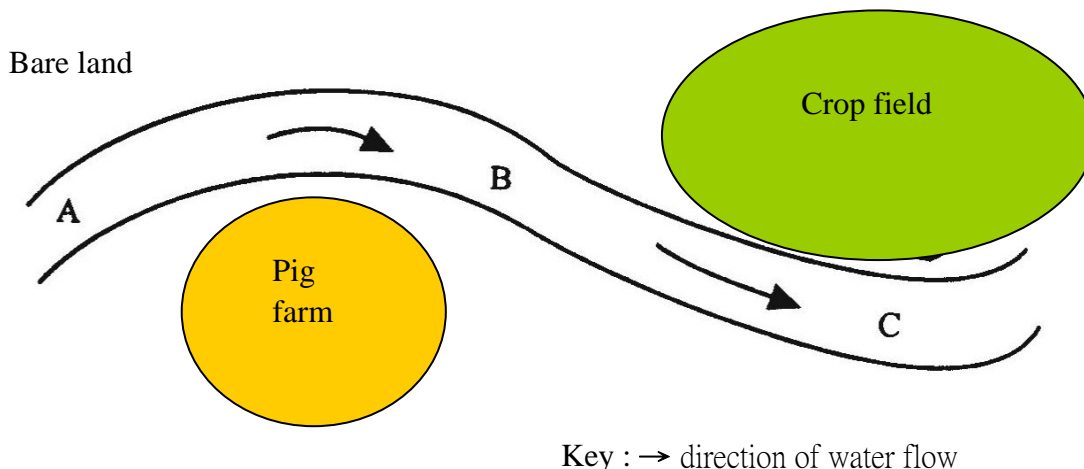
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Q.9

10. (a) The diagram below shows a river and the types of land use on the two sides of the river :

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The water quality of the river was studied by measuring the amounts of dissolved oxygen, ammonia and total suspended solids in water samples collected at three sites, A, B and C, along the river. The results are as follows ;

	Dissolved oxygen ($\text{cm}^3 \text{L}^{-1}$)	Ammonia (ppm)	Total suspended solids (g L^{-1})
Site A	6.5	0.01	0.09
Site B	0.5	0.50	0.85
Site C	1.5	4.20	1.20

(i) Explain why site B had such a low content of dissolved oxygen.

(3 marks)

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(ii) Give **TWO** possible reasons for the highest ammonia content at site C.
(2 marks)

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(iii) Suggest **ONE** way to reduce the amount of total suspended solids in the river.
(1 mark)

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(iv) Later, a factory was built on the bare land near site A. It discharged waste water containing mercury into the river. It was found that after five years some people suffered from mercury poisoning through eating fish caught from the river. How would you explain this ?
(4 marks)

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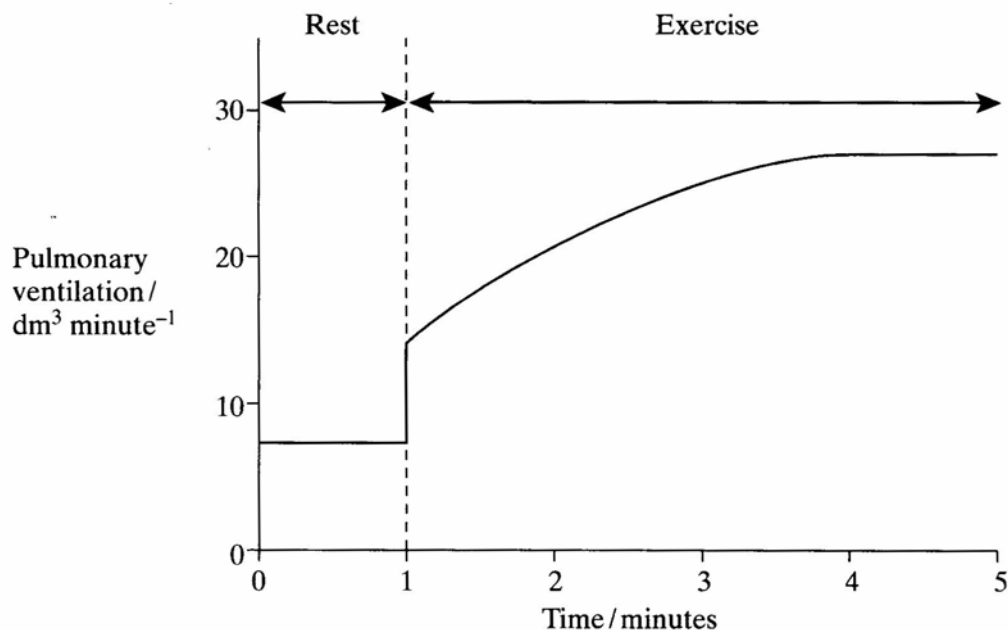
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(Total : 10 marks)

10. (b). The graph shows how pulmonary ventilation changes during a period of exercise.

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(i) Describe how pulmonary ventilation changed during the period of exercise.

(1 mark)

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(ii) After 4 minutes of exercise, the breathing rate was 20 breaths per minute. Explain how you could use this information and the graph to calculate tidal volume.

(2 marks)

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(iii) Describe how the brain increase breathing rate during exercise.
(3 marks)

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(iv) When a person starts to breathe out, the percentage of oxygen in the air first exhaled is the same as the percentage of oxygen in the atmospheric air . Explain why.
(2 marks)

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Total : 8 marks

Q.10

END OF PAPER