

FUKIEN SECONDARY SCHOOL  
S3 First Term Uniform Test (2021-2022)  
Biology  
(45 minutes)

Date: 11<sup>th</sup> November 2021

Name: \_\_\_\_\_

Time: 8:30a.m. – 9:15a.m.

Class: \_\_\_\_\_ No.: \_\_\_\_\_

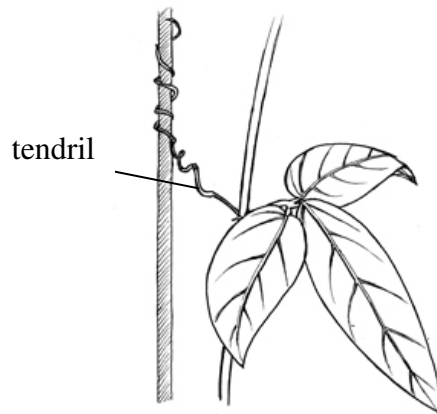
Instructions to students:

1. Write your name, class and class number on both the question paper and the answer sheets.
2. Answer ALL questions.
3. Write down all the answers on the answer sheets.
4. Hand in the question paper and the answer sheets at the end of the examination.
5. The total mark of the paper is 50.

**I. Multiple Choice Questions (20 marks)**

1. Photosynthesis is the main way for plants to carry out
  - A nutrition.
  - B respiration.
  - C growth.
  - D excretion.
  
2. Irritability enables organisms to
  - (1) find food.
  - (2) find mates.
  - (3) escape from danger.
  - A (1) and (2) only
  - B (1) and (3) only
  - C (2) and (3) only
  - D (1), (2) and (3)
  
3. Our lungs removing carbon dioxide from our body is an example of
  - A respiration.
  - B movement.
  - C excretion.
  - D reproduction.

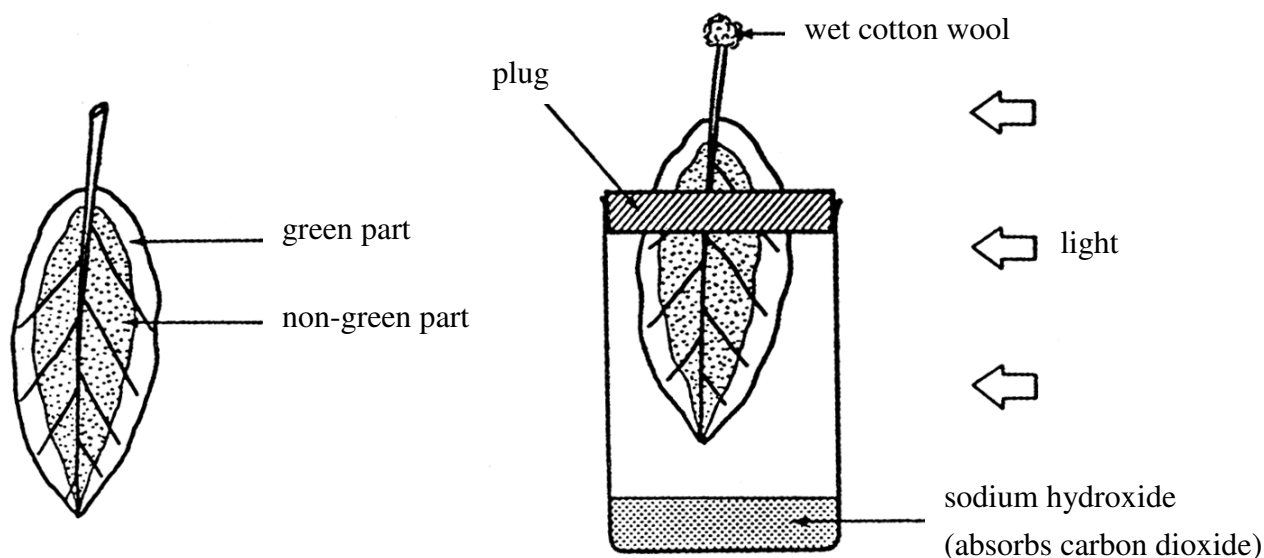
4. The following diagram shows a plant tendril. Once a tendril touches an object, it curls itself onto it as it becomes longer to help the plant cling on the object for extra support.



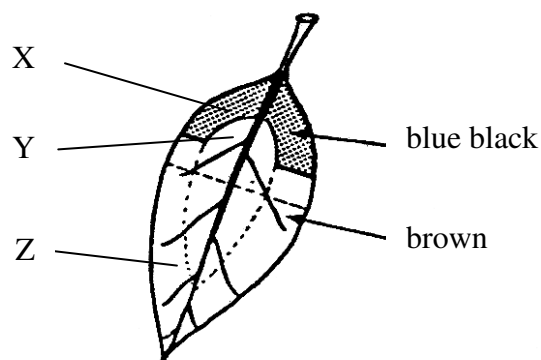
Which of the following vital functions are shown by this activity of the plant tendril?

- (1) Growth
  - (2) Movement
  - (3) Irritability
- A** (1) and (2) only
- B** (1) and (3) only
- C** (2) and (3) only
- D** (1), (2) and (3)
5. Which of the following social issues are related to Biology?
- (1) Climate change due to global warming
  - (2) Storing genetic information in a computer file
  - (3) Health problems caused by electronic cigarettes
- A** (1) and (2) only
- B** (1) and (3) only
- C** (2) and (3) only
- D** (1), (2) and (3)
6. Learning Biology can help us to
- (1) develop respect for organisms.
  - (2) make informed decisions about health issues.
  - (3) gain knowledge about the origin of the Earth.
- A** (1) and (2) only
- B** (1) and (3) only
- C** (2) and (3) only
- D** (1), (2) and (3)

**Directions:** Questions 7 and 8 refer to the experiment below. This experiment was set up to find out the necessary conditions of photosynthesis. The leaf was taken off from a destarched plant.



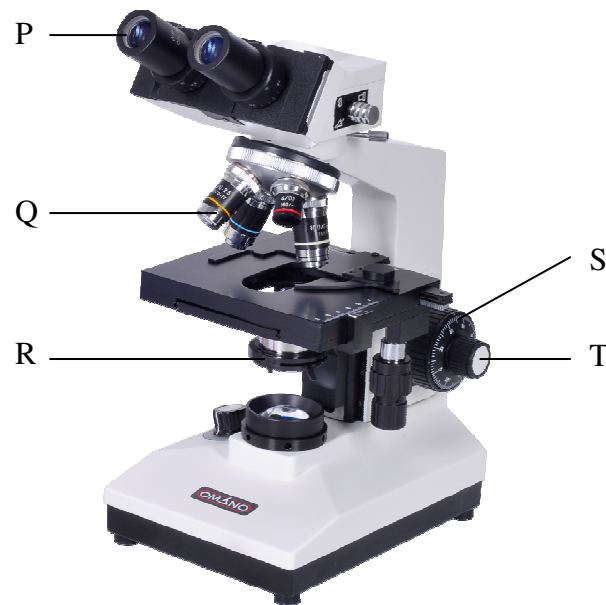
The following diagram shows the result of iodine test after the experiment.



7. By comparing the results of X and Y, we can conclude that
- A** water is necessary for photosynthesis.
  - B** light is necessary for photosynthesis.
  - C** carbon dioxide is necessary for photosynthesis.
  - D** chlorophyll is necessary for photosynthesis.
8. While comparing the results of X and Z, which of the following are the controlled variables?
- (1) Presence of light
  - (2) Presence of chlorophyll
  - (3) Presence of carbon dioxide
- A** (1) and (2) only
  - B** (1) and (3) only
  - C** (2) and (3) only
  - D** (1), (2) and (3)

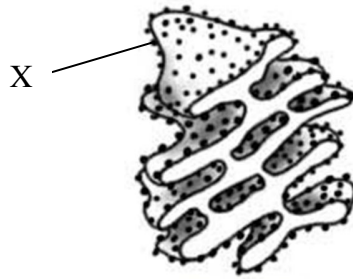
9. Arrange the following steps of a scientific method in the correct order:
- (1) Doing experiments
  - (2) Drawing a conclusion
  - (3) Making observations
  - (4) Proposing a hypothesis
- A** (1), (2), (3), (4)  
**B** (1), (4), (3), (2)  
**C** (3), (2), (1), (4)  
**D** (3), (4), (1), (2)
10. In a scientific investigation, if the results of an experiment do not match the prediction, we can
- (1) revise the method of the experiment.
  - (2) draw a conclusion.
  - (3) revise the hypothesis.
- A** (1) and (2) only  
**B** (1) and (3) only  
**C** (2) and (3) only  
**D** (1), (2) and (3)
11. A scanning electron microscope can generate image that
- (1) has colour.
  - (2) is three-dimensional.
  - (3) has high resolution.
- A** (1) and (2) only  
**B** (1) and (3) only  
**C** (2) and (3) only  
**D** (1), (2) and (3)
12. The cell theory states that
- (1) all cells come from pre-existing cells.
  - (2) all cells are capable of dividing.
  - (3) all living things are made up of cells.
- A** (1) and (2) only  
**B** (1) and (3) only  
**C** (2) and (3) only  
**D** (1), (2) and (3)

**Directions:** Questions 13 and 14 refer to following diagram. The diagram shows a light microscope.



13. The total magnification of the microscope is decided by
- (1) P.
  - (2) Q.
  - (3) R.
- A** (1) and (2) only  
**B** (1) and (3) only  
**C** (2) and (3) only  
**D** (1), (2) and (3)
14. Turning knobs S and T can
- A** change the resolution of the image.  
**B** adjust the brightness of the image.  
**C** adjust the focus of the microscope.  
**D** change the magnification rate of the lenses.
15. Increasing the magnification rate of a microscope will make you see
- (1) more cells.
  - (2) less cells.
  - (3) a brighter image.
  - (4) a dimmer image.
- A** (1) and (3) only  
**B** (1) and (4) only  
**C** (2) and (3) only  
**D** (2) and (4) only

**Directions:** Questions 16 and 17 refer to following diagram. The diagram illustrates a cell structure. X is a small particle that is found attached on its surface.

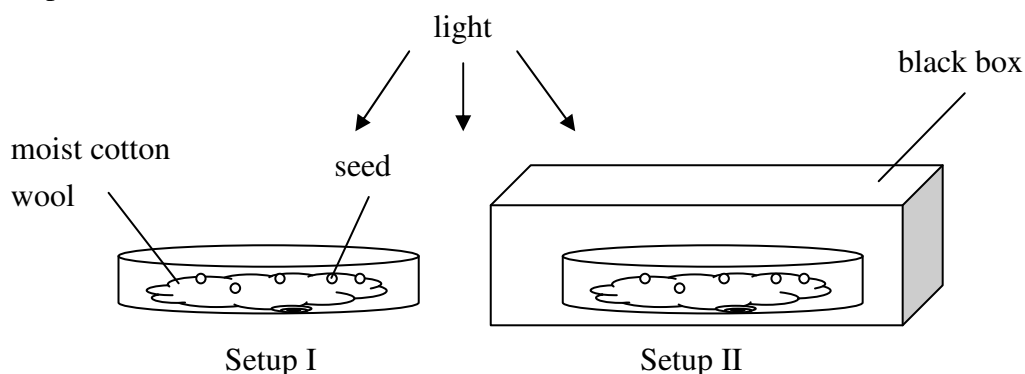


16. What is X?
- A Protein
  - B Ribosome
  - C Genetic material
  - D Chlorophyll
17. What is the function of this cell structure?
- A Transport of lipid
  - B Respiration
  - C Photosynthesis
  - D Synthesis of protein
18. The cell wall is more rigid than the cell membrane because it contains
- A protein.
  - B water.
  - C lipid.
  - D cellulose.
19. Which of the following statements about the mitochondria is correct?
- A It has a single membrane.
  - B It controls the activities of a cell.
  - C It is rod shaped.
  - D Its membrane has a lot of pores.
20. The cell membrane is differentially permeable, that means
- A it only allows certain substances to pass through.
  - B it only allows useful substances to pass through.
  - C it only allows water-soluble substances to pass through.
  - D it does not allow any substance to pass through.

**End of Section I**

## II Structured Questions (30 marks)

1. Peter thinks light is probably required for seeds to germinate. He then designed the following experiment.



Twenty seeds were put onto a piece of moist cotton wool and were allowed to stay in a dish. Setup I was put under sunlight. Setup II was prepared in a similar way but was covered with a black box. The number of seeds germinated was counted after five days and the results are as follows:

Setup	I	II
Number of seeds germinated	19	18

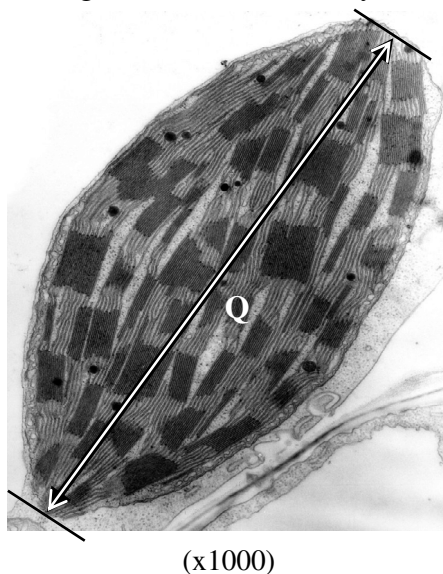
- (a)
    - (i) What is the independent variable of this experiment? (1 mark)
    - (ii) What is the dependent variable of this experiment? (1 mark)
    - (iii) Give **two** controlled variables of this experiment. (2 marks)
  - (b) What was the hypothesis stated by Peter? (1 mark)
  - (c) Did the result of the experiment support his hypothesis? Explain your answer. (2 marks)
2. Read the following passage about viruses.

Viruses are very small in size. They are not made up of cells. Instead they only consist of a protein coat with a piece of genetic material within. Viruses do not require any energy to exist. They do not increase in size and cannot multiply on their own. However, they do have mechanisms to detect the presence of a suitable cell nearby to infect. Once a virus is attached to such cell, it can inject its genetic material into the cell and cause it to make new viruses.

Answer the following questions according to the passage.

- (a) Suggest **two** vital functions of organisms that are absent in viruses. (2 marks)
- (b) Besides lacking the vital functions of organisms, give **one** other reason why viruses are not considered as organisms. (1 mark)
- (c) An ability of the virus is very similar to one of the vital functions of organisms. Describe the ability and state which vital function of organisms it is similar to. (2 marks)
- (d) Viruses cause many diseases in humans. State **two** advantages of learning about viruses. (2 marks)

3. The following image shows an organelle which can only be found in some plant cells.



- (a) Name this organelle. (1 mark)
  - (b) What is the function of this organelle? (1 mark)
  - (c) Give **one** similarity in structure between this organelle and a nucleus. (1 mark)
  - (d) Find the actual length (Q) of the organelle. Show your workings. (2 marks)
  - (e) Which type of microscope was used to produce the above image? Explain your answer. (2 marks)
  - (f) State **one** advantage and **one** disadvantage of this type of microscope. (2 marks)
  - (g) State **one** kind of plant cell that does not contain this organelle. (1 mark)
  - (h) Besides this organelle, state another cell structure that can only be found in plant cells. (1 mark)
4. (a) Write down the levels of body organization in ascending order starting with the cell as shown below:

Cell → (i) → (ii) → (iii) → Organism (3 marks)

- (b) The diagram below shows a heart.



Which level of body organization does the heart belong to? Explain your answer.

(2 marks)

**End of Paper**