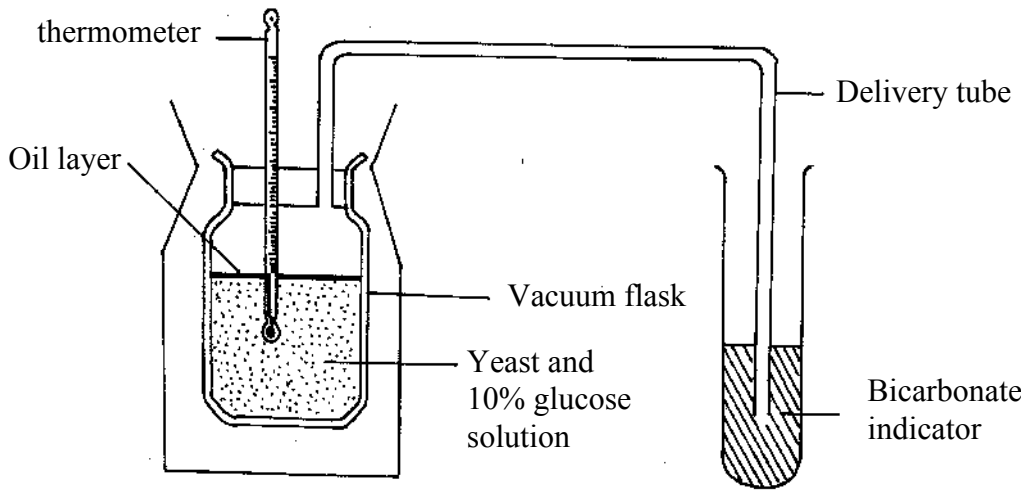


**231/2****BIOLOGY**

- 1.
- (a) In an electron microscope.....is used to illuminate the specimen under observation. (1mk) \* Nym\*
- (b) Name the parts of a light microscope, which perform each of the following functions. (3mks). \* Nym\*
- (i) Controls the amount of light entering the specimen. \* Nym\*
- (ii) Magnifies the object. \* Nym\*
- (iii) Used for focusing image under low power. \* Nym\*
- (c) Below is a list of cell organelles: \* Nym\*
- Mitochondria
  - Lysosomes
  - Nucleous
  - Endoplasmic reticulum
  - Golgi apparatus
  - Ribosomes
  - Centriole
- From the above list, select the organelle that performs the functions listed below. (3mks) \* Nym\*
- (i) Synthesises RNA (Ribonucleic acid) \* Nym\*
- (ii) Formation of spindle fibres during cell division. \* Nym\*
- (iii) Packages synthesized protein. \* Nym\*
- (d) Which organelle would be abundant in cardiac muscle? (1mk) \* Nym\*
2. In Andalusian chicken, the genes for black feather and white feather colours are co-dominant. A white chicken was crossed with a black chicken, all the F1 chicks were blue feathered. Using the symbols B and W to represent the genes for black colour and white colour respectively: -
- (a) What is the phenotypic ratio if the F1 offspring were selfed? Show your working (3mks) \* Nym\*
- (b) State the possible genotypes when a black-feathered cock is crossed with a blue-feathered hen. (2mks) \* Nym\*
- (c) Name one sex-linked characteristic in human beings. (1mk) \* Nym\*
3. The body of animals is constantly being invaded by pathogenic microorganisms, which enter the body through the mouth, nose and wounds. \* Nym\*
- (a) Explain the mechanisms that prevents entry of micro-organisms into the body through:
- (i) The mouth (1mk) \* Nym\*
- (ii) Wounds (1mk) \* Nym\*
- (iii) Respiratory track through the nose. (2mks) \* Nym\*
- (b) Explain how the body defends against diseases once these micro-organisms have entered the body tissues. (3mks) \* Nym\*
4. The experiment below was set-up to investigate some physiological processes. The glucose solution was first boiled then cooled. The set-up was left for 24hrs. \* Nym\*

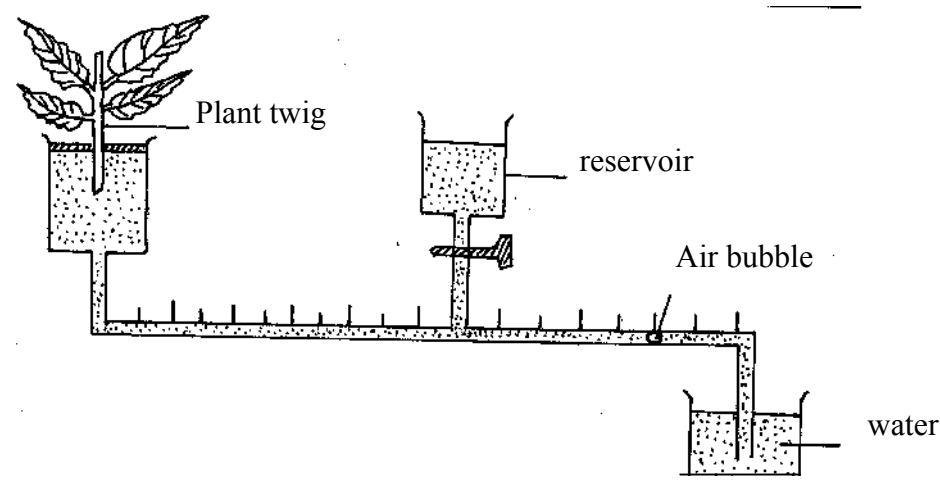


- (a) Suggest two aims of the experiment. (2mks) \* Nym\*
- (b)(i) State the expected observations after 24 hours. (2mks) \* Nym\*
- (ii) Explain your observations in a (i) above. (1mk) \* Nym\*
- (iii) Why was glucose solution boiled then cooled? (1mk) \* Nym\*
- (d) Suggest a control for the above experiment (1mk) \* Nym\*
- 5. Gastrin is a hormone produced by mammals. \* Nym\*
  - (a)(i) Where is the hormone produced? (1mk) \* Nym\*
  - (i) What is the function of gastrin? (1mk) \* Nym\*
  - (b) What stimulates the production of gastrin? (1mk) \* Nym\*
- (c) State three adaptations of the human large intestine to its functions. (3mk) \* Nym\*
- 6. (a) Name two methods used for locomotion in unicellular organisms. (2mks) \* Nym\*
  - (b) (i) Name the type of skeleton found in insect. (1mk) \* Nym\*
  - (ii) What substance is the insect skeleton made of? (1mk) \* Nym\*
  - (c) State **three** reasons why locomotion is important in animals. (3mks) \* Nym\*

**SECTION B (40MRSK)**

Answer question 7 (Compulsory) in the spaces provided. Answer either question 8 or 9 in the spaces provided at the end of this paper.

- 7. An investigation was conducted to compare water loss from twigs of two species of plants Q and L. The apparatus shown below was used for this investigation. The two twigs had equal leaf surface area. \* Nym\*

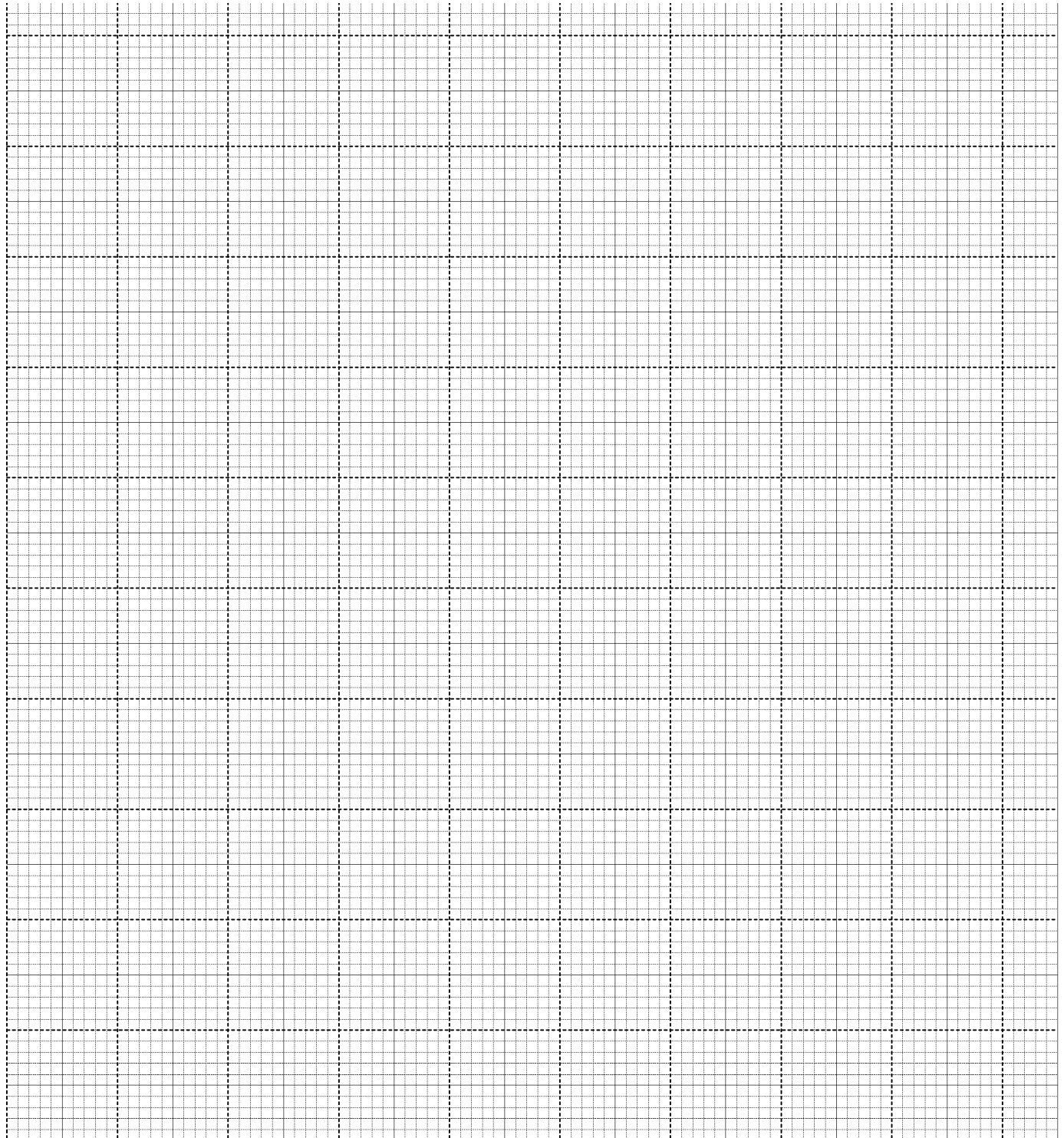


The results of the investigation was recorded in the table below.

Time in day	2am	6am	8am	10am	12noon	1pm	2pm	3pm	4pm	6pm	8pm	12 midnight
Water loss $gh^{-1}$ species Q	0	0	5	50	60	85	55	48	40	2	0	0
Water loss $gh^{-1}$ species L	14	14	35	135	275	315	285	245	175	75	16	16

Plot a graph of water loss  $gh^{-1}$  against time for the two plant species.

(6mks) \* Nym\*



- (b) (i) Name the apparatus used in the above investigation. (1mk) \* Nym\*  
(ii) State two precautions that were taken in setting up this experiment. (2mks) \* Nym\*  
(c) Which of the plant species is likely to be adapted to arid conditions? Give a reason. (2mks) \* Nym\*
- (d) Use the graph to answer the questions that follows.  
(i) At what time of the day was  $240\text{gh}^{-1}$  of water lost by plant species L? (1mk) \* Nym\*  
(ii) What was the rate of water loss from plant species Q at 11.00am? (1mk) \* Nym\*
- (e)  
(i) Account for the rate of water loss between 2.00am to 6.00am by plant species L. (2mks) \* Nym\*  
(ii) Account for the rate of water loss between 6.00am and 1.00pm in plant species L (2mks) \* Nym\*
- (f) Suggest how the stomata of species Q is structurally adapted for water loss. (3mks). \* Nym\*
8. a) Describe how you would use the capture recapture method to estimate the population of grasshoppers in school farm. (9mks) \* Nym\*
- b) Discuss the physical factors that are likely to influence the population of grasshoppers in the school farm. (11mks) \* Nym\*
9. Discuss the role of plant hormones in their growth and development and application in agriculture. (20mks) \* Nym\*