

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/2

BIOLOGY 2
ALTERNATIVE TO PRACTICAL
(For Both School and Private Candidates)

Time: 2½ Hours

9 November 2001 a.m.

Instructions

- 1. This paper consists of FIVE (5) questions**
- 2. Answer ALL questions.**
- 3. Each question carries 10 marks.**
- 4. All answers must be written in the answer booklet (s) provided.**
- 5. Write your Examination Number on every page of your answer booklet(s).**

1. During a Biology practical lesson, students were provided with extracts M_1 , M_2 and M_3 obtained from a coconut, an Irish potato and an eggwhite. They were asked to carry out food tests so as to determine which of M_1 , M_2 and M_3 was a coconut, a potato or an eggwhite extract.

- (a) Using a table as shown below (Table 1) write down the experimental work which leads to the identification of M_1 , M_2 and M_3 .

Table 1

Test	Procedure	Observation	Inference

- (b) (i) What is the importance of the food substances identified in (a) above in the human body?
(ii) In what form and where are these foods stored in the human body?
2. 10 cm^3 (mls) of yeast suspensions was added to 30 cm^3 of 10 % glucose solution in a boiling test tube. The test tube was stoppered with a cork fitted with a delivery tube leading to test tube X containing clear lime water. Duplicates of this apparatus were prepared and maintained at different temperatures. The number of gas bubbles seen in each test tube after 10 minutes were recorded as follows:

Temperature °C	10	20	30	40	50	60
Number of gas bubbles per minute	5	13	21	25	27	11

- (a) What reaction occurred in the boiling test tube?
(b) What substance was formed in the boiling test tube?
(c) Plot a graph of Number of gas bubbles per minute (Y axis) against Temperature (X axis)
(d) What was the best temperature range for the reaction?
(e) (i) State the changes observed in the lime water in test tube X.
(ii) What gas brought about these changes?
(f) Explain why the number of bubbles at 10°C and 60°C was small.

The diagrams below (Figure 1 – 4) represent 4 organisms. Study them and answer the questions which follow.

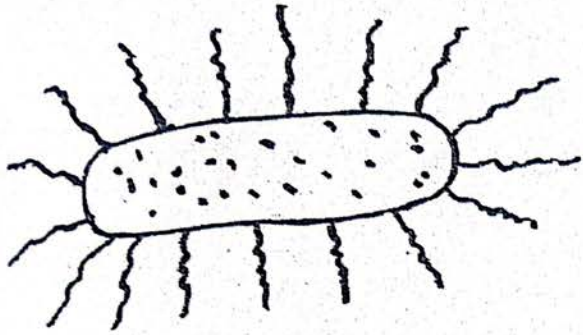


Fig. 1

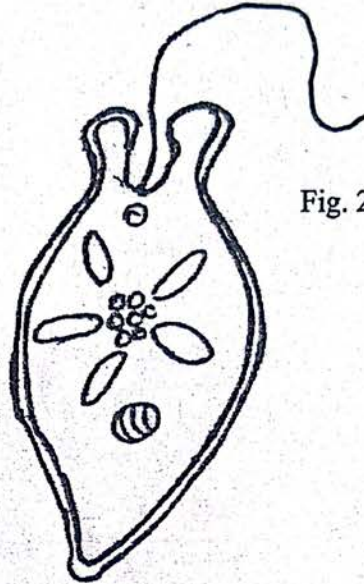


Fig. 2

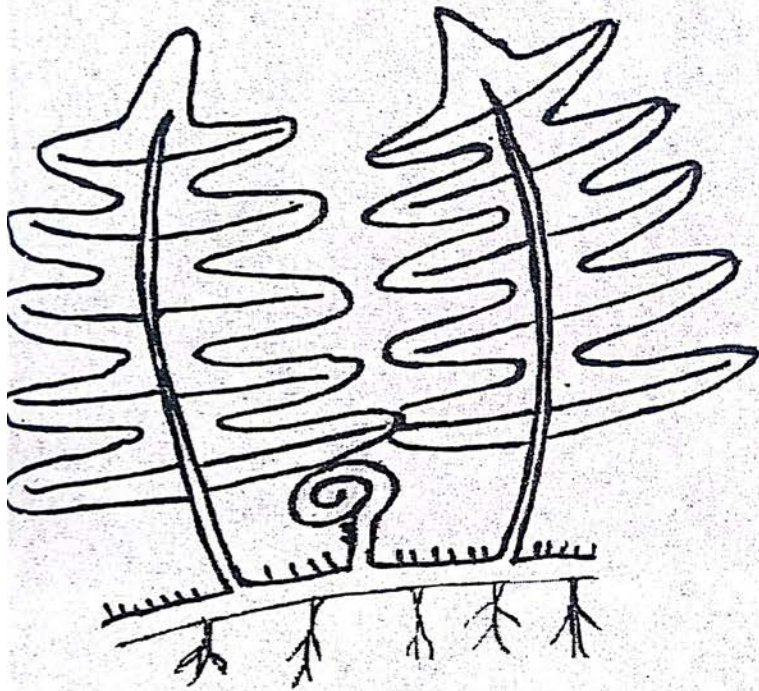


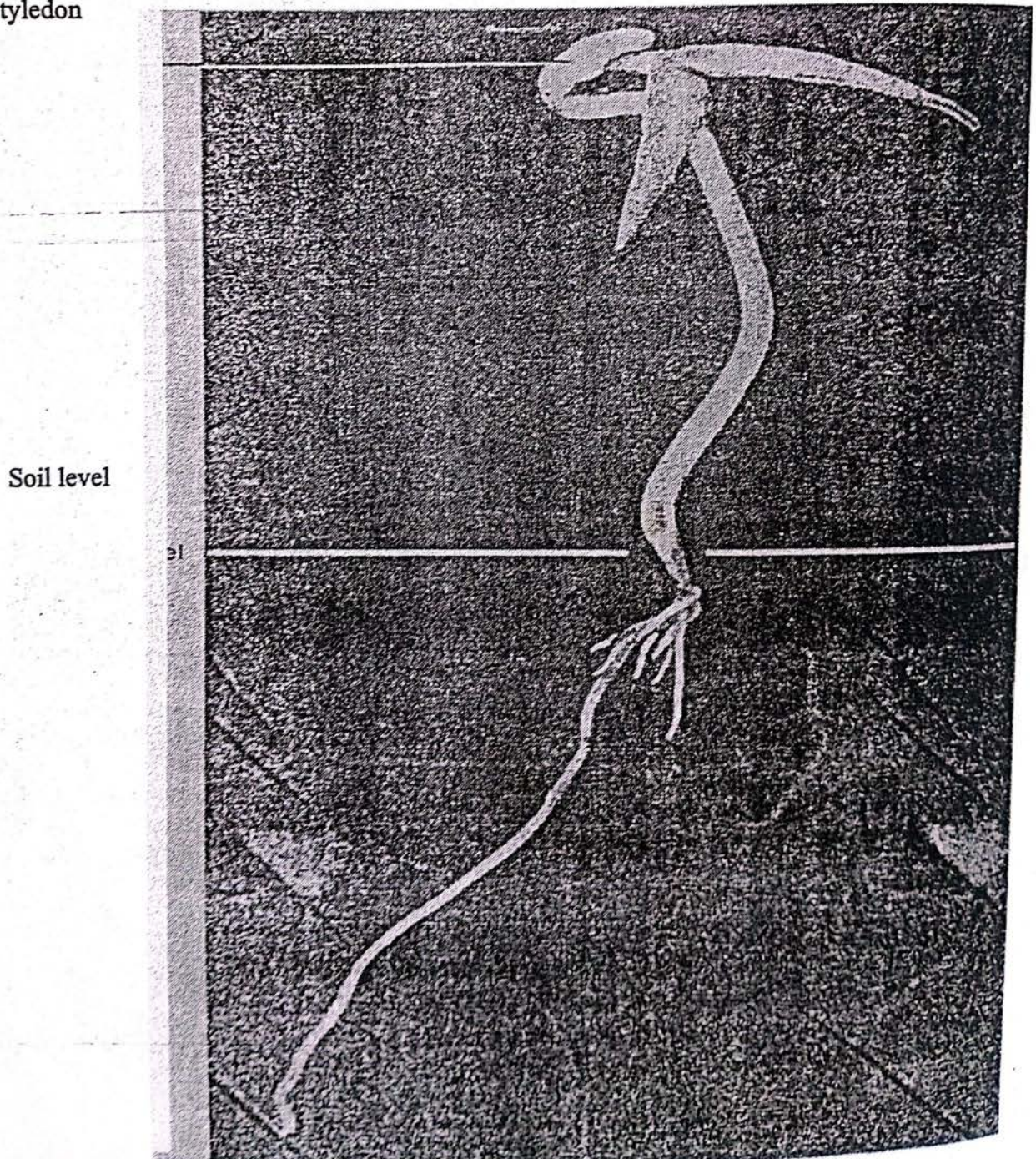
Fig. 3



Fig. 4

- (a) (i) Identify the organisms in figures 1, 2, 3 and 4 by their common names.
(ii) Place organisms 1, 2, 3 and 4 in their kingdoms.
- (b) (i) Write down two features which place the organisms in figs. 1 and 2 into their respective kingdoms.
(ii) State the economic importance of the organism shown in figure 2.
- (c) (i) List two general characteristics of the organism in figure 3 which place it in its respective kingdom.
(ii) What is the importance of each characteristic named in (c) (i) above in the life of the organism?

4. Green cotyledon



Soil level

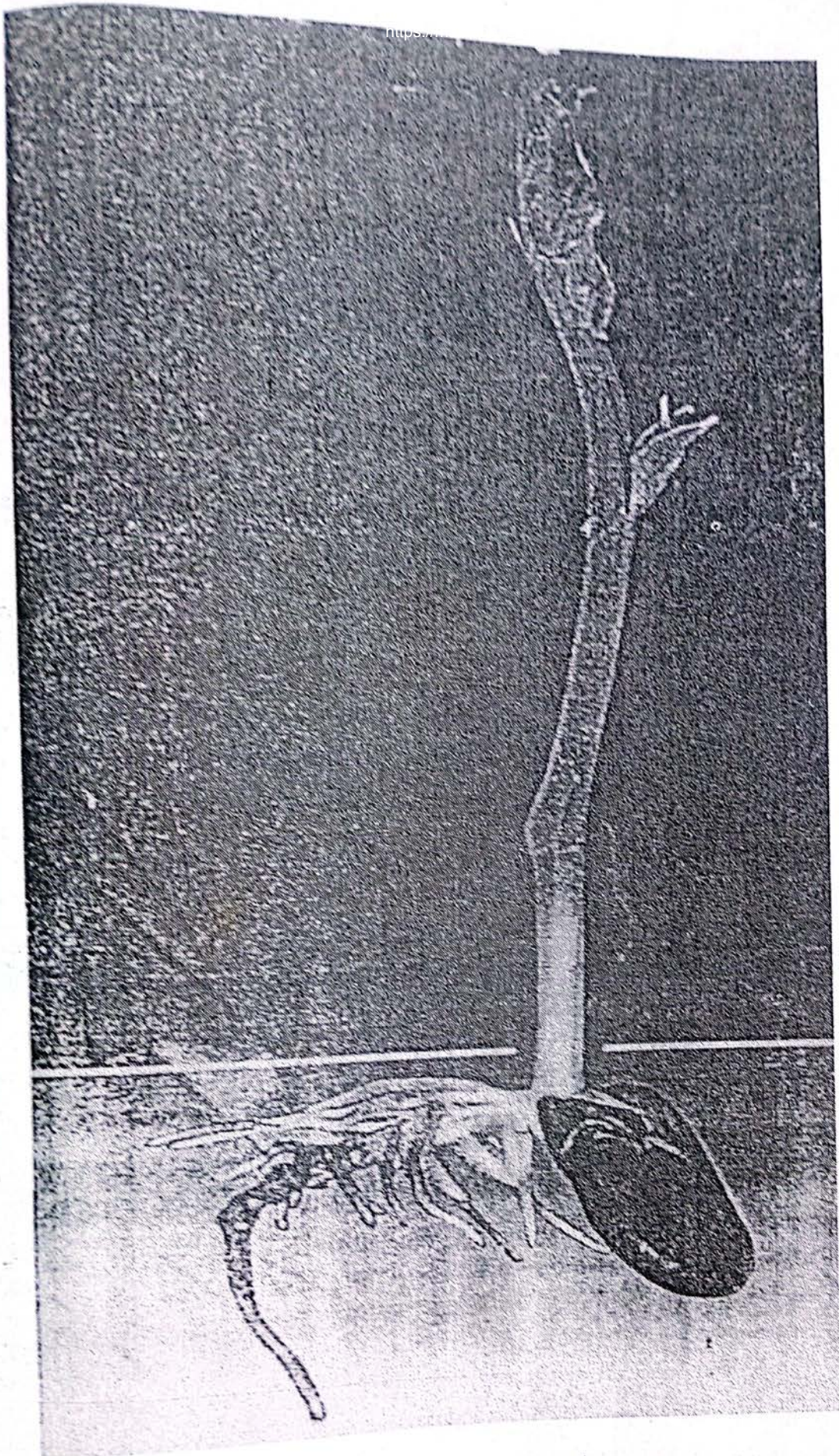


Figure 6: Seedling B

(a) Figure 5 and 6 are photographs of seedlings of two varieties of beans, A and B respectively.

(i) Make large labelled drawings of the two varieties.

(ii) In a table form, as shown below, show three visible differences, other than size, between seedlings A and B.

	Seedling A	Seedling B
1		
2		
3		

(b) Figure 7 shows a food web for a fresh water pond. For each of the trophic levels listed below, name two examples of organisms (identify them by numbers).

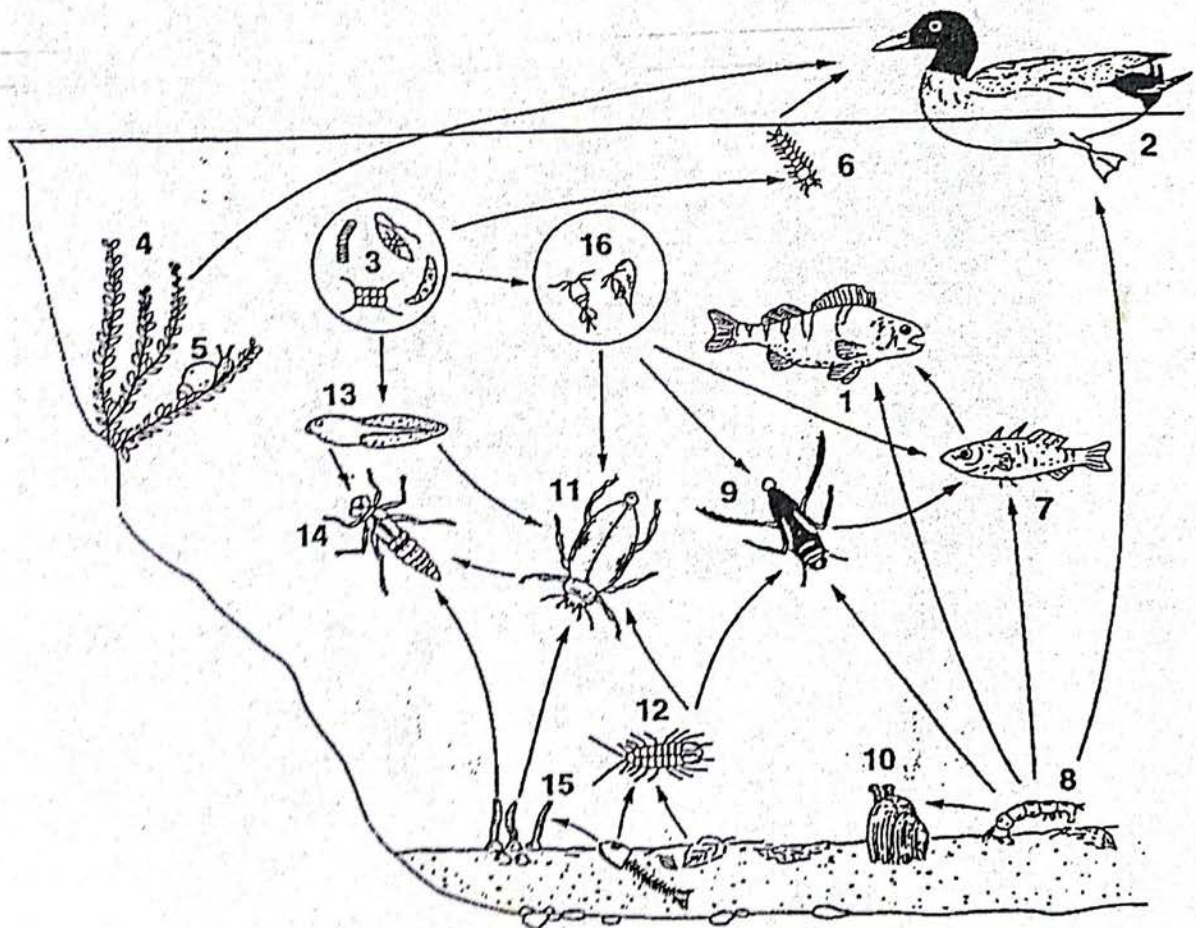


Figure 7

- (i) Primary consumers (herbivores)
- (ii) Secondary consumers (carnivores)

(c) Using only the numbers in figure 7, construct a simple food chain involving 4 stages.

... used the apparatus to investigate how the rate of photosynthesis of an aquatic plant changed between 1300 hours and 2100 hours on a sunny day.

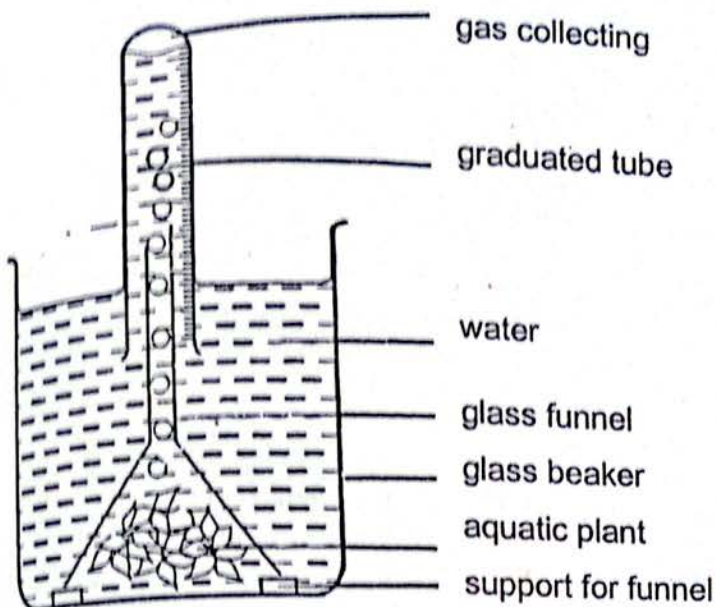


Fig. 8

The apparatus was left in an open space outside.

- Suggest why the funnel was supported at the bottom of the beaker as shown in the diagram.
- Name the gas which collected in the graduated tube.
- Describe how you would test this gas and the observations you would make.

Every 2 hours the student recorded the volume of gas which had collected in the graduated tube. The diagrams below (figure 9) show the volume of the gas that collected in the tube at different times.

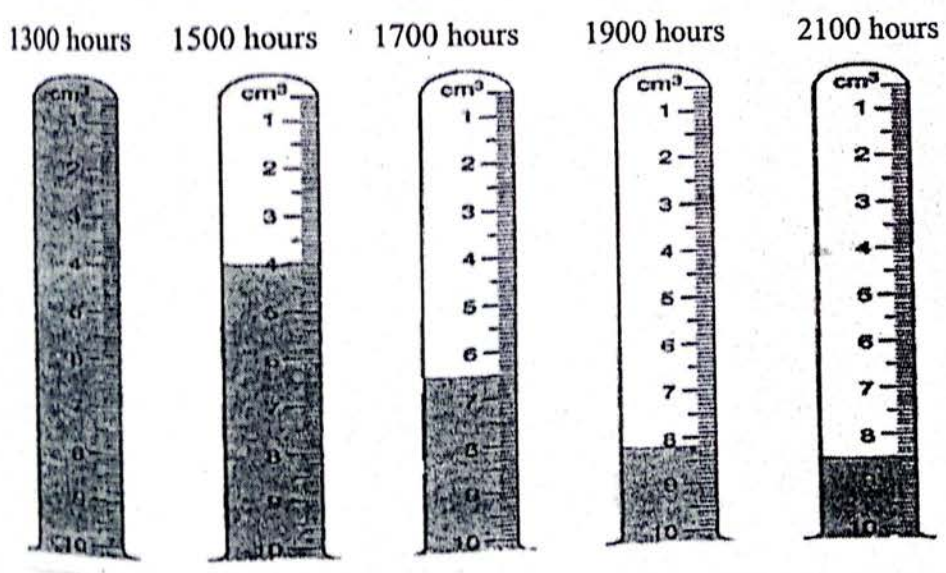


Fig. 9

- Draw a suitable result table to show the total volume of gas which had collected at the times shown.
- Plot a line graph of volume of gas collected against time of the day.
- Suggest an explanation for the shape of the graph you have drawn in b(ii) above.