

Name candidate's signature.....

Date

231/2

Biology

Time: 2hrs.

Term 1

Biology

Paper 231/2

Time: 2hrs

Instructions to candidates

.Write your name, index number in the spaces provided above.

.Sign and write the date of examination in the spaces provided above.

.This paper consists of two sections. A and B.

.Answer all the questions in section a in the spaces provided.

.In section B answer question 7(compulsory) and either question 8 or 9 in the spaces provided after question 9.

.Check to ascertain that all pages are printed and that no questions are missing.

FOR EXAMINER'S USE ONLY

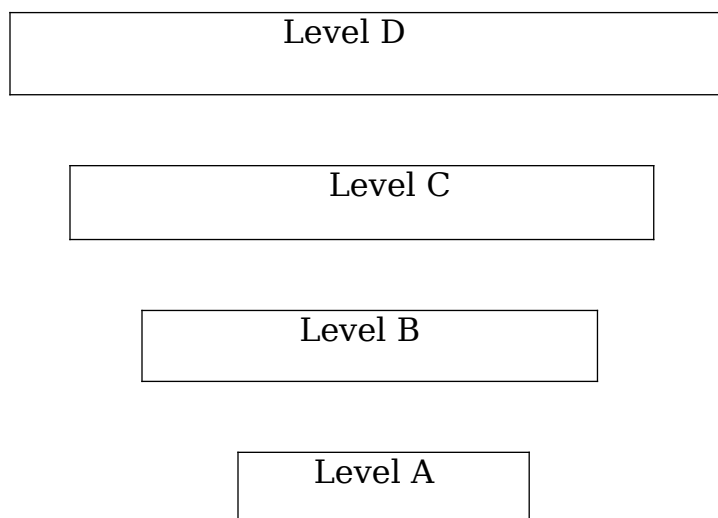
SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
	1	7	
	2	6	
	3	7	
	4	7	
	5	6	
	6	7	

	7	20	
	8	20	
	9	20	
Total score		80	

SECTION A 40MKS

Answer all questions in this section in the spaces provided.

Q1. In an ecosystem energy flows from the sun and is transferred in a series of organisms. The diagram represents different levels of energy levels of energy transfer.



(a) Insert the sun in the diagram and using arrows show the direction of energy transfer. (1mk)

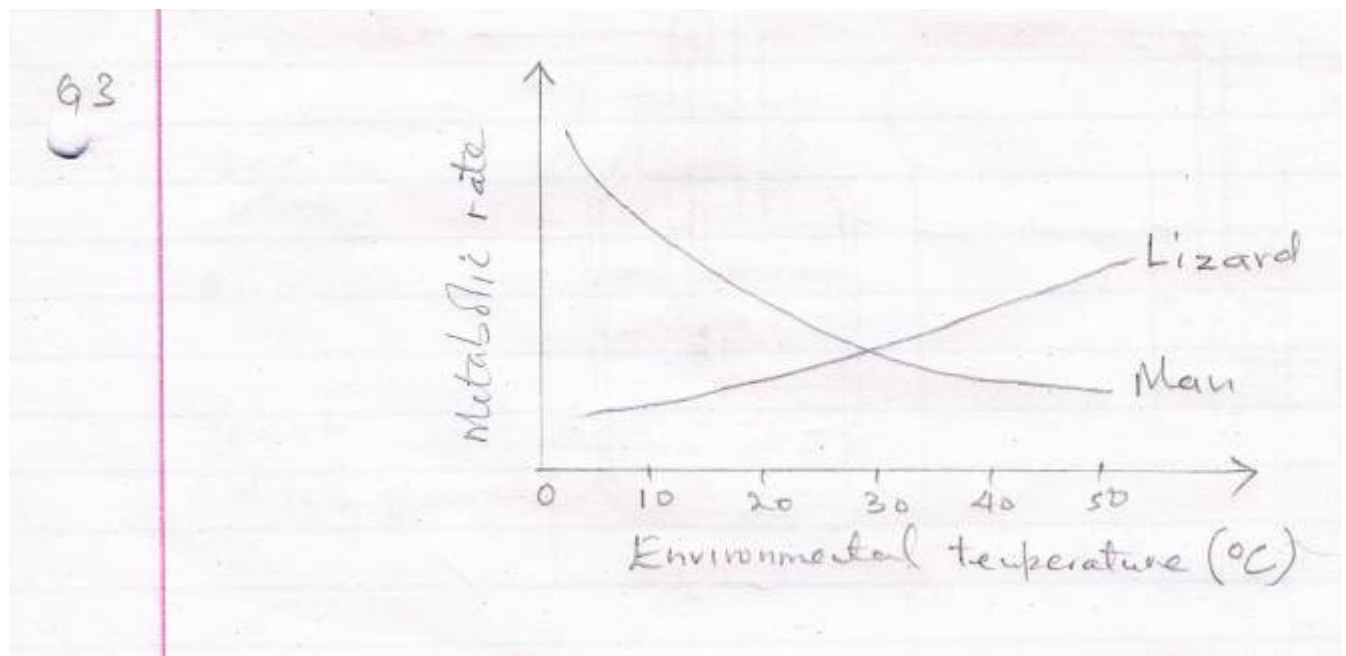
(b) Name the trophic levels represented by D and B (2mks)

(c) Identify the general trend in the amount of energy along the path illustrated in (a) give reasons for the trend. (2mks)

(d) Explain short term effect of decreasing the number of individuals in the level C. (2mks)

Q2. In maize, yellow colour W is dominant over white colour. Describe how one would establish whether a given sample of yellow maize is pure or hybrid. Show your working. (4mks)

Q3. The sketch graph shows how the metabolic rate in man and lizard is affected by environmental temperature.



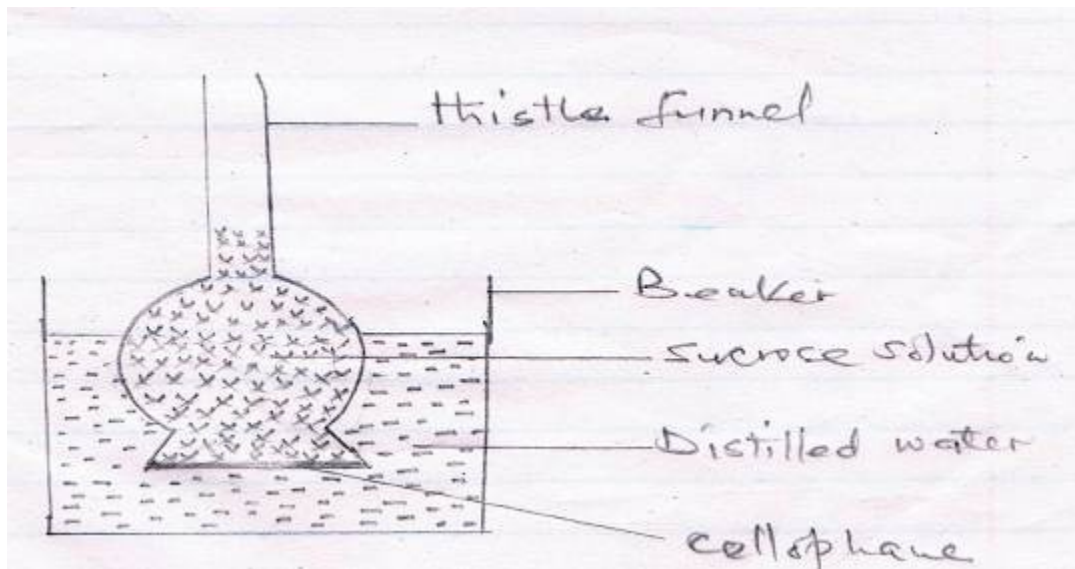
a) Suggest why the metabolic rate was high in man between 5°C and 20°C. (2mks)

b) Account for increase in metabolic rate in lizard as environmental temperature was increasing. (2mks)

c) (i) state **two** physiological processes that occur in man when environmental temperature rises above 35°C. (2mks)

(ii) How would the lizard respond to similar temperature changes in (c) (1mk)

Q4. The apparatus shown was set up by a group of students.



a) What was the aim of the experiment? (1mk)

b) Explain the results obtained in the set up at the end of the experiment.
(2mks)

c) State the expected results if the cellophane was replaced with a thin section of

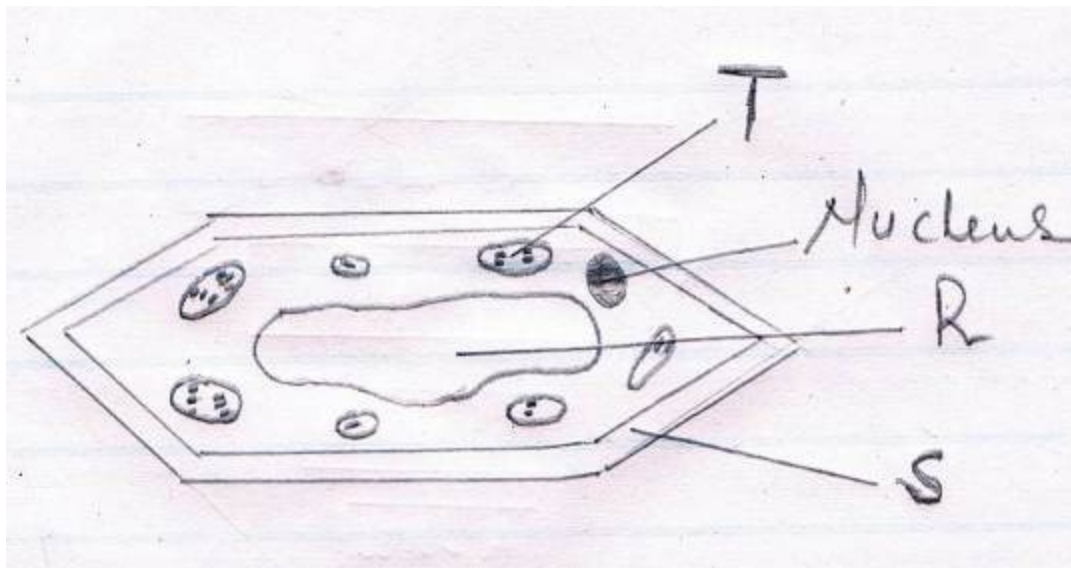
(i) Raw arrowroot (1mk)

(ii) Boiled arrowroot (1mk)

(d) (i) Account for the results obtained in (c) (ii). (1mk)

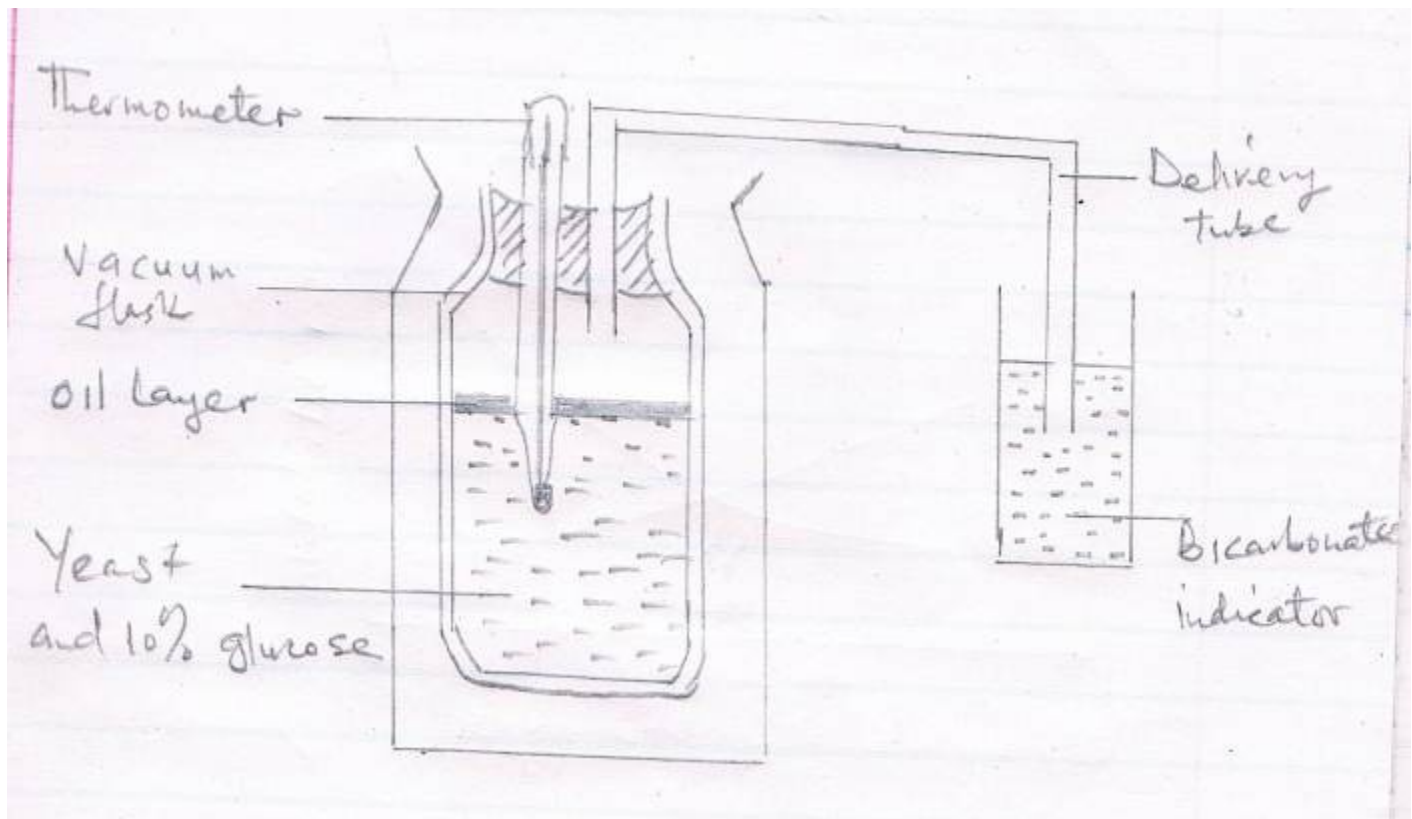
(ii) What is the equivalent of sucrose solution in plant tissue? (3mks)

Q5. The diagram represents a plant cell



- a) Name a carbohydrate which forms the structure label S. (1mk)
- b) (i) state the function of the part labeled R (2mks)
- (ii) Suggest what would happen in the plant if the number of organelle labeled T is reduced.
- .(1mk)
- (c) Name **two** cell organelles present in the diagram but absent in animal cells (2mks)

Q6. The set of apparatus was assembled by a group of students to investigate some physiological process.



a) (i) give **two** aims of the experiment. (2mks)

(ii) Explain the observation expected after 24 hours. (2mks)

b) Before experiment, the glucose solution was boiled then cooled.

(i) Why was it necessary to boil the solution? (1mk)

(ii) What was the importance of oil layer in the experiment?(1mk)

c) Describe a control experiment for the set up. (1mk)

- d) Suggest two industrial application of the process being investigated.
(1mk)

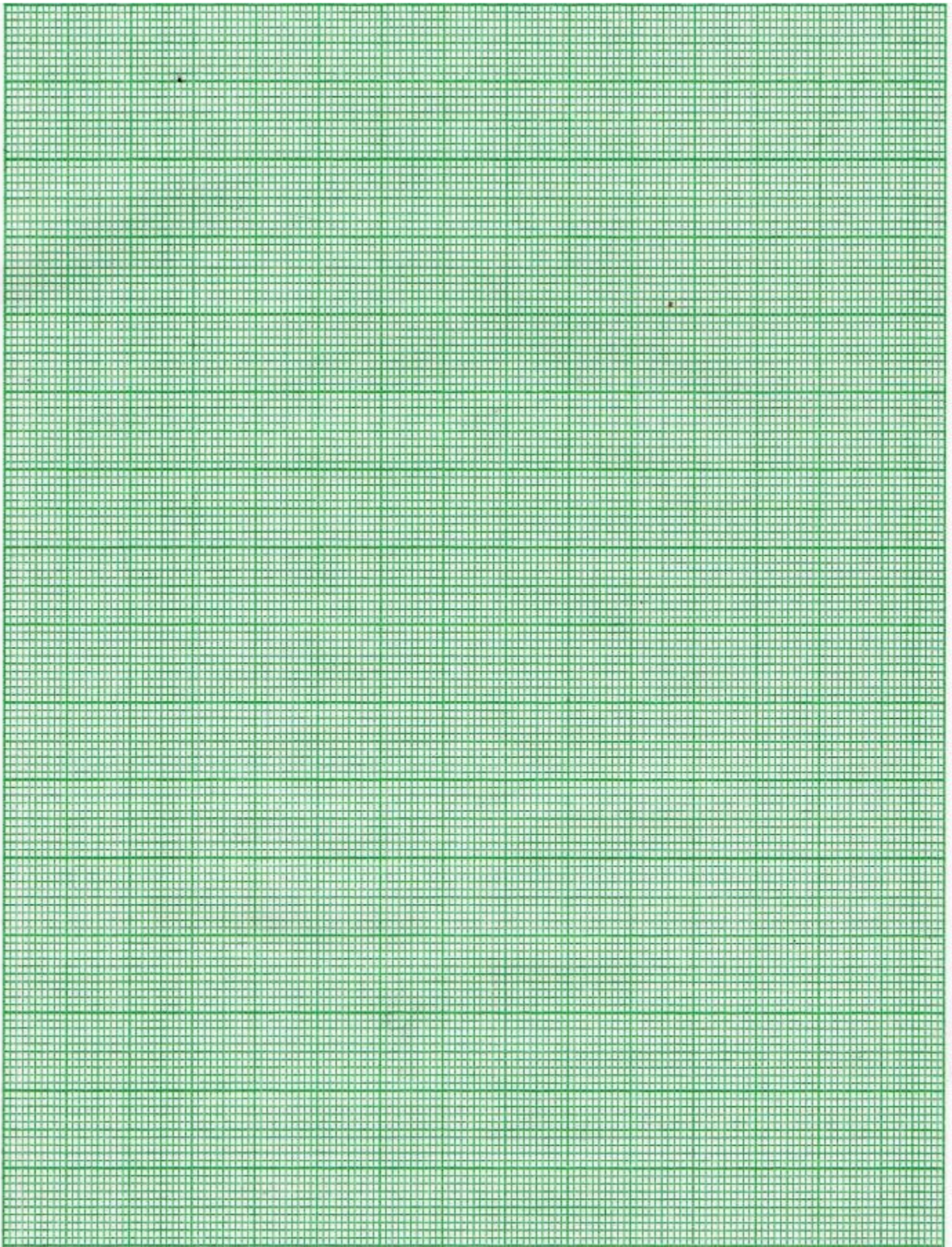
SECTION B (40mks)

Answer question 7 (compulsory) and EITHER question 8 or 9 in the spaces provided after question 9

Q7 The table below represents body weight, metabolic rate and eaten per day by different mammals. (Compulsory)

Animal	Body weight	Metabolic rate (cm³) Oxygen/ghr	Food eaten per day (kg)
Rat	0.10	800	0.098
Hare	2.00	480	1.2
Dog	8.00	300	3.0
Man	60.00	150	4.0
Horse	200.0	100	15.0
Elephant	800.0	86	40.0

- a) (i) Draw a graph of metabolic rate against body weight of the animals
(6mks)



(ii) From the graph estimate the metabolic rate of an animal whose body weight is 35 kg (2mks)

b) Express the food eaten per day of the following mammals as a percentage of their body weight.

(i) Rat (2mks)

(ii) Elephant (2mks)

c) Account for the difference in percentage obtained in (b) (4mks)

d) Which of the six mammals would least suffer dehydration during a sunny day? Give reasons for your answers. (2mks)

e) A reptile would require less food than a mammal of the same weight. Explain. (2mks)

Q8. (a) Define the terms

(i) Transpiration (2mks)

(ii) Translocation (2mks)

(b) Explain **five** factors that affect the rate of transpiration in plants.
(16mks)

Q9. (a) Define

(i) Chemical evolution (2mks)

(ii) Organic evolution (2mks)

(b) Describe the evidence of organic evolution (16mks)