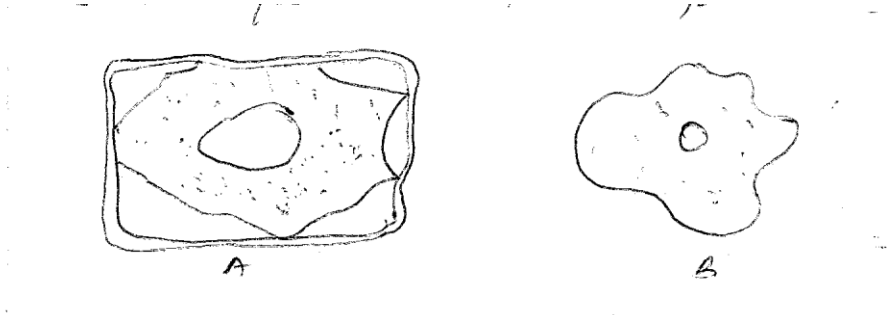


**FORM 4 TERM 2 NOVEMBER 2021**  
**BIOLOGY PAPER 2**

*Instructions to candidates: Answer All Questions in the Spaces Provided*

1. The diagram shows two types of cells placed in a certain solution. Study them and answer questions that follow



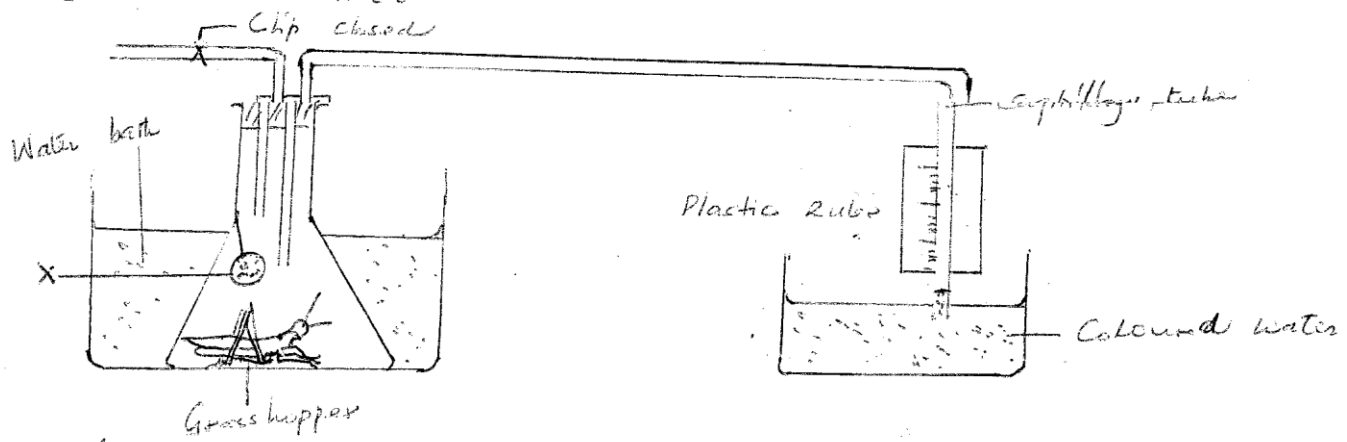
- a. Name the physiological process responsible for the observed results. [1 Mark]
- b. Give the correct biological term used to describe cells A & B. [2 Marks]
- A –
- B –

2. The equation below shows a chemical reaction that takes place in plants.

Carbon (iv) oxide + water                      A + water

- a. Identify substance A. [1 Mark]
- b. Name the process represented by the equation. [1 Mark]
- c. Other than the reactants state **two** conditions necessary for this reaction. [2 Marks]
- i.
- ii.

3. The diagram below illustrates an experiment used to determine rate of respiration in a small insect.



- a. Name the chemical compound labeled X and state its function. [2 Marks]

Compound –

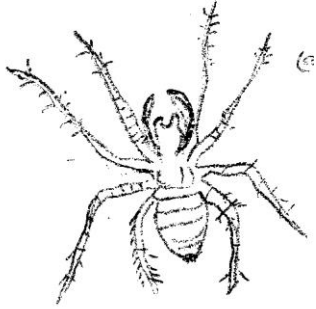
Function –

- b. Why is the conical flask placed in a water bath? [1 Mark]

- c. What would happen to the level of coloured water after 5 minutes? Explain: [2 Marks]

- d. How can a control experiment be set? [1 Mark]

4. In a biology lesson a student collected the animal in the diagram below.  
Use it to answer questions that follow;



a. Name the phylum and class to which the organism belongs

i. Phylum \_\_\_\_\_

[1 Mark]

ii. Class \_\_\_\_\_

[1 Mark]

b. Give two reasons for your answer in 1 (i), (ii) above

[4 Marks]

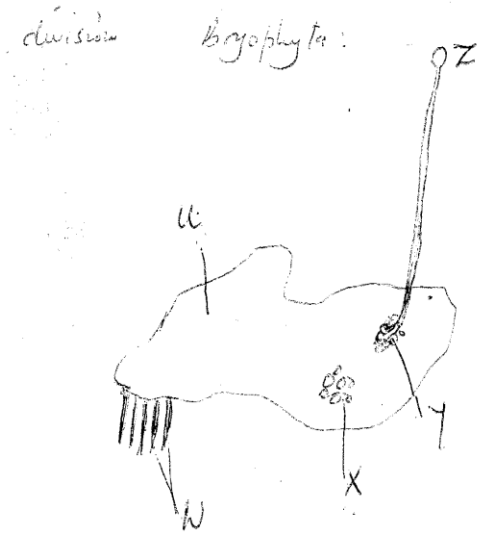
i. \_\_\_\_\_

\_\_\_\_\_

ii. \_\_\_\_\_

\_\_\_\_\_

5. The diagram below represents a plant in the division Bryophyta:



a. Name the parts labeled

[5 Marks]

U

W

X

Y

Z

b. Name one function of part labeled.

[3 Marks]

X

Y

Z

6.

a. It is observed that when apical bud of a plant is removed, lateral buds sprouts, where as they do not sprout in presence of the apical bud;

i. What is the biological term used to describe this?

[1 Mark]

ii. Give one application of this phenomena in agriculture.

[1 Mark]

b. State four roles of IAA in plant growth and development:

[4 Marks]

c. In epigeal germination the cotyledon is brought above the soil surfaces; Explain [2 Marks]

7.

a. State 2 structural modifications of nephrons in desert mammals. [2 Marks]

b. State a kidney disease whose symptom is coloured and turbid urine [1 Mark]

8. In a biological experiment; a cross was made between a tall pea plant & dwarfs plants; their progeny was selfed and the resulting plants were in a mixture in the ratio of 3:1. Make a biological cross to show these outcomes. [4 Marks]

9. Explain geographical distribution as evidence of organic evolution. [2 Marks]

## SECTION B

**Answer Questions 10 (Compulsory) and either question 11 or 12 in the Spaces Provided**

10. The table below shows the changes observed in the dry weight in milligrams of a barley seedling, its embryo and Endosperm during the first ten days after the onset of germination.

Time (days)	Dry weight in milligrams		
	Embryo	Endosperm	Whole seedling
0	2	41	45
2	2	39	43
4	7	32	41
6	15	21	38
8	22	11	35
10	35	6	43

- a. Using a suitable scale and on the same axis, plot a graph of dry weight of embryo, endosperm and whole seedling against time. [8 Marks]
- b. State and account for the changes in dry weight shown by:-
- i. Endosperm [4 Marks]
  - ii. Embryo [4 Marks]
- c. Explain the role of water during germination [4 Marks]
- 11.
- a. Describe how the mammalian heart is adapted to its function [10 Marks]
- b. How does gaseous exchange take place in terrestrial plants? [10 Marks]
- 12.
- a. How is the Epidermis of a green plant adapted to its function? [6 Marks]
- b. Describe how structural factors affect rate of transpiration in plants [8 Marks]
- c. Describe how xerophytes adapted to minimize water loss in their habitat. [6 Marks]