**MWAKICAN EXAMINATION**

**END TERM 1 2015**

**BIOLOGY FORM 4 PAPER 2**

**TIME 2 Hrs**

NAME: …………………………………………………………… ADM NO: ……………….. CLASS: …….

*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



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

A –

B –

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

Carbon (iv) oxide + water A + water

* 1. Identify substance A. [1 Mark]
	2. Name the process represented by the equation. [1 Mark]
	3. Other than the reactants state **two** conditions necessary for this reaction. [2 Marks]
		1.
		2.
1. The diagram below illustrates an experiment used to determine rate of respiration in a small insect.



* 1. Name the chemical compound labeled X and state its function. [2 Marks]

Compound –

 Function –

* 1. Why is the conical flask placed in a water bath? [1 Mark]
	2. What would happen to the level of coloured water after 5 minutes? Explain: [2 Marks]
	3. How can a control experiment be set? [1 Mark]
1. In a biology lesson a student collected the animal in the diagram below.

Use it to answer questions that follow;



* 1. Name the phylum and class to which the organism belongs
		1. Phylum \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1 Mark]
		2. Class\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1 Mark]
	2. Give two reasons for your answer in 1 (i), (ii) above [4 Marks]
		1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The diagram below represents a plant in the division Byrophyta:



* 1. Name the parts labeled [5 Marks]

U

W

X

Y

Z

* 1. Name one function of part labeled. [3 Marks]

X

Y

Z

1. 1. 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;
		1. What is the biological term used to describe this? [1 Mark]
		2. Give one application of this phenomena in agriculture. [1 Mark]
	2. State four roles of IAA in plant growth and development: [4 Marks]
	3. In epigeal germination the cotyledon is brought above the soil surfaces; Explain

 [2 Marks]

1. 1. State 2 structural modifications of nephrons in desert mammals. [2 Marks]
	2. State a kidney disease whose symptom is coloured and turbid urine [1 Mark]
2. 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]
3. 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***

1. 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.

|  |  |
| --- | --- |
|  | Dry weight in milligrams |
| Time (days) | 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 |

* 1. 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]
	2. State and account for the changes in dry weight shown by:-
		1. Endosperm [4 Marks]
		2. Embryo [4 Marks]
	3. Explain the role of water during germination [4 Marks]
	4. Describe how the mammalian heart is adapted to its function [10 Marks]
	5. How does gaseous exchange take place in terrestrial plants? [10 Marks]
1. 1. How is the Epidermis of a green plant adapted to its function? [6 Marks]
	2. Describe how structural factors affect rate of transpiration in plants [8 Marks]
	3. Describe how xerophytes adapted to minimize water loss in their habitat. [6 Marks]