**NAME…………………………………………………………..ADM………CLASS………**

**BIOLOGY**

**FORM THREE**

**TERM 2 2022 OPENER EXAM FORM 3**

**TIME: 2HRS 30 MINS**

**INSTRUCTION TO STUDENTS**

1. **Answer all Questions**
2. State two functions of centrioles in an animal cell. (2mks)
3. Name two classes of phylum Arthropoda that have a cephalothorax. (2mks)
4. Other than having common characteristics state the main features of a species. (2mks)
5. The diagram below represents a transverse section of a plant organ.



1. From which plant organ was the section obtained. (1mk)
2. Give two reasons for your answer in (a) above. (2mks)
3. Name the parts labeled. (3mks)

J

K

L

1. State function of the part labeled M. (1mk)
2. Name the class from which this section was obtained. (1mk)
3. The diagram below shows an organelle that is found in most cells. Study it and answer questions that follow.



1. Name the organelle. (1mk)
2. State the function of the organelle named in (a) above. (1mk)
3. Give the full name of the major chemical compound that is found in the organelle. (1mk)
4. Identify the gas that is required in order to form the compound you have stated in (c) above. (1mk)
5. Give the name of the structures labeled H and give their function. (2mks)
6. Name the gaseous exchange structure in the following organisms.

a. i. Amoeba 1mk

ii. Grasshopper 1mk

iii. Frog 2mks

b. The diagram below illustrates the structure of a gill from a bony fish.



1. Name the parts labeled (3mks)

A

B

C

1. State the function of the part labeled C. (1mk)
2. How is part B adapted to its functions? (2mks)
3. During a biological practical lesson, the teacher provided students with the following apparatus: pooter, scapel, specimen bottle a pair of forceps, sweep net, chloroform.
4. Give three precautions the biology teacher gave to the students before the practical when collection of specimen began. (3mks)
5. What was the function of the following apparatus. (3mks)
6. Pooter
7. Sweep net
8. Chloroform
9. Other than observation, give other two scientific skills developed by studying biology. (2mks)
10. An investigation was performed by a group of students as shown in the set up below.



After 30 minutes, the starch suspension had turned blue-black while iodine solution retained its brown color.

1. Name the physiological process that was being investigated. (1mk)
2. Account for the results observed after 30 minutes. (3mks)
3. Explain what would happen to the red blood cells when placed in distilled water and left to stand for the same duration as for the experiment above. (3mks)
4. Define cell physiology. (1mk)
5. Observe the photographs of the specimens shown below and answer questions that follow.



1. a. Leaf simple………………………………………………. Go to 2

 b. leaf compound…………………………………………... go to 4

2. a. Leaf parallel veined ……………………………………. Maize

 b. Leaf network veined…………………………………… go to 3

3. a. Leaf margin smooth……………………………………. Bougainvillea

 b. Leaf margin serrated …………………………………… Hibiscus

4.a. Trifoliate compound leaf………………………………... crotalaria

 b. Pinnately compound leaf………………………………… go to 5

5. a. Bipinnate………………………………………………… Jacaranda

 b. Unipinnate………………………………………………. Rose

Use the above steps to identify the specimen. (7mks)

|  |  |  |
| --- | --- | --- |
| **Leaf**  | **Steps followed**  | **Identify**  |
| A  |  |  |
| B  |  |  |
| C  |  |  |
| D  |  |  |
| E  |  |  |
| F  |  |  |

1. After an ecological study of feeding relationship students constructed a food web shown below.



1. Name the process by which energy from the sun is incorporated into the food web. (1mk)
2. The biomass of producers in this ecosystem was found to be grater than that of primary consumers. Explain. (1mk)
3. From the information in the food web, construct a food chain with large fish as tertiary consumers. (1mk)
4. What would happen to the organisms in the food web of bird L migrated. (2mks)
5. Name an organism with the least biomass. (1mk)
6. State three human activities that would negatively affect the population of organisms in the above food web. (3mks)
7. The diagram below illustrates a nephron from a mammalian kidney.



1. Name the parts labeled: (3mks)

A

B

C

D

1. Name the process represented by the arrows. (1mk)
2. Name one substance that remains at part B. (1mk)
3. How does the part labeled **C** of camel compare with that of a hippo. (2mks)
4. An experiment was carried out to investigate the effect of temperature on the rate of a reaction catalyzed by salivary amylase. The pH was maintained slightly alkaline. The results are as shown in the table below.

|  |  |
| --- | --- |
| **Temperature**  | **Rate of reaction** |
| 5 | 0.3 |
| 10 | 0.5 |
| 20 | 1.3 |
| 25 | 2.0 |
| 30 | 3.5 |
| 35 | 4.8 |
| 38 | 4.8 |
| 45 | 2.5 |
| 50 | 0.8 |

1. On the graph paper provided plot a graph of the rate of reaction against temperature. (7mks)
2. What is the optimum temperature of this enzyme? (1mk)
3. At what temperature was the rate of reaction 1.4? (2mks)
4. Account for the shape of the graph between:
5. 5oC and 35oC (2mks)
6. 30oC and 50oC (2mks)
7. How is HCl from the stomach neutralized and where does it occur? (2mks)
8. Name one digestive enzyme that works best in acidic conditions. (1mk)
9. In an attempt to estimate the number of weaver birds, in a small wood land 435 were captured, marked and released. Three days later, 620 were captured 75 of which were marked.
10. What is the name of the population estimation method described above? (1mk)
11. Calculate the approximate size of the weaver birds population in the wood land. (2mks)

**Answer only one question between qn 13 and qn 14**

1. Describe how the mammalian skin is adapted to its functions. (20mks)
2. Describe how a leaf from a terrestrial habitat is adapted to its photosynthetic functions. (20mks)

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