**EMBU WEST CLUSTER EXAMINATION**

**BIOLOGY FORM THREE (THEORY)**

**PAPER ONE**

**NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_CLASS\_\_\_\_\_\_\_\_\_\_ADM NO\_\_\_\_\_\_\_\_\_**

**INSTRUCTIONS.**

1. Write name and admission number in the spaces provided.
2. Answer all questions in the spaces provided.
3. Answers must be provided in the question paper.
4. Check question paper to ascertain that you have 25 printed questions.
5. All answers must be in correct English.

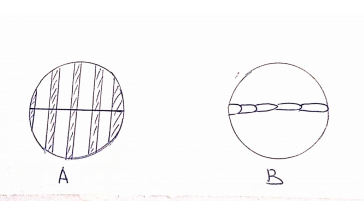
|  |  |  |
| --- | --- | --- |
| Question | Maximum score | Candidates score |
| 1 – 28 |  |  |

1. a) Name **two** industrial processes that require the knowledge of biology. (2mks)

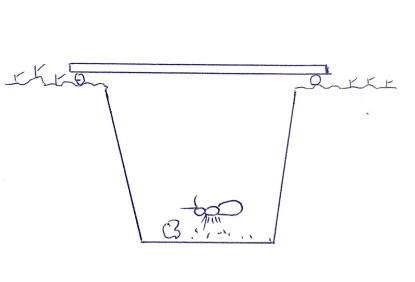
b) A young scientist observed a bird laying he eggs in a nest and later the eggs hatched into chicks. Name **two** characteristics shown by the chicks that show a chick is a living thing but an egg is not. (2mks)

1. a) Name the cell organelle that would be most abundant in;
2. White blood cell (1mk)
3. Salivary glands. (1mk)
4. Palisade cells. (1mk)
5. a) Name the part of a light microscope used to bring an image of a specimen into sharp focus. (1mk)

b) The field of view of a light microscope appeared as shown below in diagram A and the diameter in A was occupied by cells as shown in B. estimate the size of one cell. (2mks)



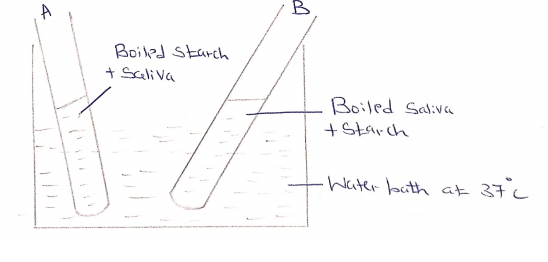
1. study the diagram below and answer questions that follow



1. What is the name given to the apparatus shown above? (1mk)
2. What is its use in biological studies? (1mk)
3. Name one chemical commonly used to immobilize specimen in a school laboratory. (1mk)
4. Equal amounts of rabbit blood were added to equal volumes of salt solutions but different concentration. The results were shown in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| Set up | Sodium chloride Concentration. | Number of red blood cells | |
| **Start of experiment** | **End of experiment** |
| A | 0.8% | Normal | No change in number and shape |
| B | 0.3% | Normal | Fewer in number |

1. Account for the results in the set – up B. (3mks)
2. If the experiment was repeated using 1.5% sodium chloride concentration. State the expected results in relation to:
3. Number of red blood cells. (1mk)
4. Appearance of red blood cells as viewed under the light microscope. (1mk)
5. An experiment was set up to investigate an aspect of digestion.



The test tubes were left in water bath maintained at constant and optimum temperature for 30 minutes. The contents of each test tube were thereafter tested for starch using iodine solution.

1. What was the aim of the experiment? (1mk)
2. Explain the results expected in the test tube.

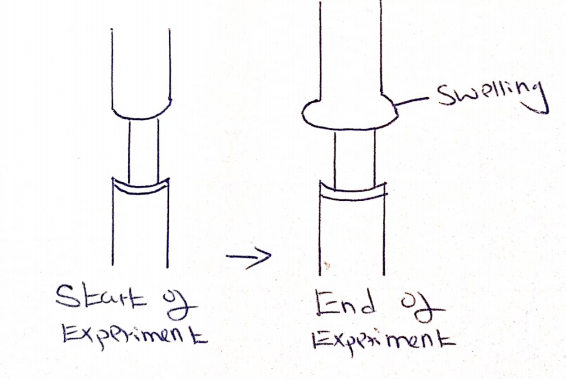
A (2mks)

B (2mks)

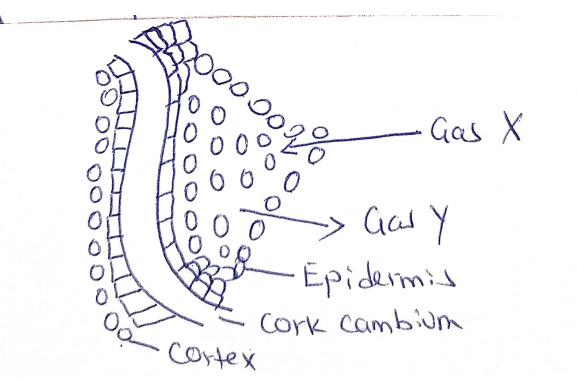
1. a) Name the specific part of the chloroplast where the following processes occurs.
2. Carbon (iv) Oxide fixation. (1mk)
3. Photolysis. (1mk)

b) State the fate of oxygen produced during photolysis. (2mks)

1. An animal had the following dentition. 0 incisors, 2 canines, 4 premolars and 4 molars on the upper jaw; 2 canines, 4 premolar and 4 molars on the lower jaw.
2. Construct the dental formula for the animal described above. (1mk)
3. What is the mode of feeding of the animal? (1mk)
4. State the function of diastema. (1mk)
5. A student cut a ring around a tree as shown in the diagram below while investigating a certain process in plants. After 3 months he made the observation represented in the diagram below.



1. Name the process that was being investigated. (1mk)
2. Name the tissue that was removed when the tree back was removed. (1mk)
3. Account for the observation made after 3 months. (2mks)
4. State any **one** adaptation of the tissue named in 9 (b) above. (1mk)
5. State **two** causes of Coronary thrombosis. (2mks)
6. State **two** roles of human blood other than transport. (2mks)
7. Name the surface of gaseous exchange in the following.
8. Paramecium (1mk)
9. Terrestrial insects. (1mk)
10. Frogs (1mk)
11. The diagram below represents a structure for gaseous exchange in plants.



1. Identify the structure illustrated above. (1mk)
2. Name the gas represented by X and Y. (2mks)

X \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Y \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Study the flow chart below of a process that takes place in both plants and animals.

C6H12O6

Products Z

Pyruvic acid

Enzyme controlled chemical reaction X

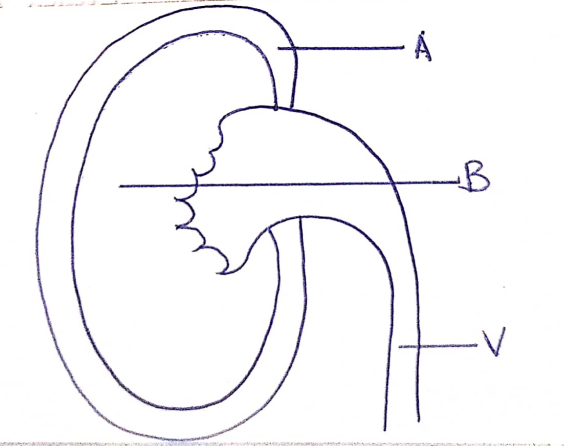
Enzyme controlled reaction in organelle Y of the cell in an absence of oxygen

In both plants and animals

1. Name the above process. (1mk)
2. In the above process name the chemical reaction represented by X. (1mk)
3. Identify products Z in plants. (2mks)
4. Calculate the respiratory Quotient from the equation below. (2mks)

2C51H98O6 + 145O2 102CO2 + 98H2O + Energy

1. Describe how plants compensate for their lack of an elaborate excretory system. (3mks)
2. The figure below show a longitudinal section through a mammalian kidney.

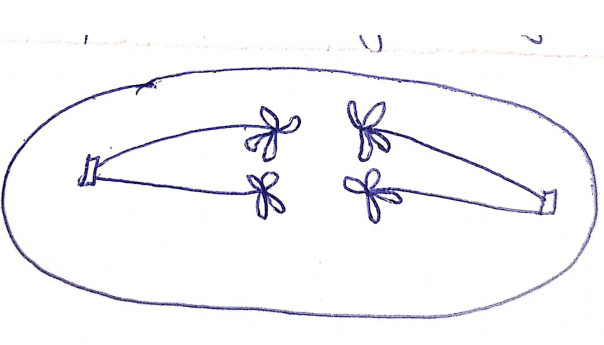


1. Which part of the above section are the Bowman’s capsule found? (1mk)
2. The content of part labeled V were boiled with Benedict’s solution and an orange precipitate was formed.
3. Suggest the disorder the said person was suffering from. (1mk)
4. State the control measure to be taken to manage the disorder. (1mk)
5. Below is an illustration of an organisms captured by students during a practical lesson.

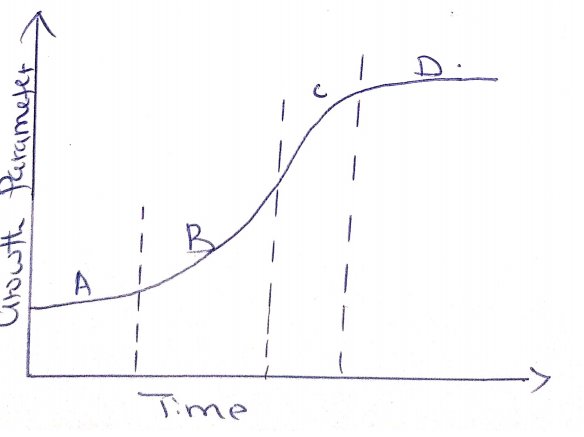
1. Identify **three** features that enable the organism to be placed in the phylum Arthropoda. (3mks)
2. Explain why the organism will die when Vaseline is applied on its thorax. (1mk)
3. Use the illustration below to answer questions that follow.



1. Identify the type of pollution that has such effects. (1mk)
2. State **two** effects of the type of pollution identified in 19 (a) above to the organism. (2mks)
3. Name the causative agent of the following diseases. (2mks)
4. Typhoid
5. Tuberculosis.
6. Students during a biological excursion captured 80 crickets from their natural eco system of which they marked all of them with an indelible ink and released them back to their habitat. After 72 hours they captured 62 crickets, of which 20 had the indelible ink mark. Estimate the population of crickets in that ecosystem. (2mks)
7. Explain why biomass of organisms decrease at each preceding trophic level. (2mks)
8. The diagram below represents a stage during cell division.



1. Identify the stage of cell division. (1mk)
2. Describe the significance of prophase I. (2mks)
3. State the functions of each of the following parts of male reproductive system.
4. Sertoli cells. (1mk)
5. Epididymis (1mk)
6. Seminiferous tubules. (1mk)
7. The graph below shows the growth curve of an organism.



1. Name the phase of growth labeled B and D. (2mks)
2. Explain the reasons for the slow growth rate in phase A. (2mks)