EMBU WEST CLUSTER EXAMINATION.

BIOLOGY PAPER ONE MARKING SCHEME

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

* Brewing.
* Bread baking
* Manufacture of milk products.
* Manufacture of medicinal drugs. (any two)

**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)**

- Reproduction.

- Growth and development.

1. **a) Name the cell organelle that would be most abundant in;**
2. **White blood cell (1mk)**

* lysosomes

1. **Salivary glands. (1mk)**

* Golgi apparatus/golgi bodies

1. **Palisade cells. (1mk)**

* chloroplast

1. **a) Name the part of a light microscope used to bring an image of a specimen into sharp focus.**  **(1mk)**

* fine adjustment knob

**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)**

-

= ;

= 800 micrometers;

1. **study the diagram below and answer questions that follow**
2. **What is the name given to the apparatus shown above? (1mk)**

* Pitfall trap.

1. **What is its use in biological studies? (1mk)**

* To trap small crawling animals.

1. **Name one chemical commonly used to immobilize specimen in a school laboratory. (1mk)**

* Diethyl ether; chloroform;

1. 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 | 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)**

* B – Fewer number of (red blood cells); 0.3% was hypotonic to red blood cells; leading to haemolysis of the red blood cells;

1. **If the experiment was repeated using 1.5% sodium chloride concentration. State the** expected results in relation to:
2. **Number of red blood cells. (1mk)**

* Number will not change;

1. **Appearance of red blood cells as viewed under the light microscope. (1mk)**

* Red blood cells will appear small in size/wrnkled/crenated/shrink.

1. 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 content of each test tube were thereafter tested for starch using iodine solution.**

1. **What was the aim of the experiment? (1mk)**

* To investigate the effect of heat/boiling on salivary amylase.

1. **Explain the results expected in the test tube.**

A (2mks)

* Brown colour of iodine was retained/persisted; because all starch was digested by enzyme amylase;

B (2mks)

* Colour of iodine changed to blueblack; because starch was present;

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

-Stroma

1. **Photolysis. (1mk)**

- Granum

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

* Released to the environment;
* Used for respiration

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)**

* i, c, pm, m;

1. **What is the mode of feeding of the animal? (1mk)**

* Herbivorous; reject herbivore

1. **State the function of diastema. (1mk)**

* Provides space for manipulation/turning of food without biting/chewing the tongue during chewing;

1. 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.
2. **Name the process that was being investigated. (1mk)**

* Translocation.

1. **Name the tissue that was removed when the tree back was removed. (1mk)**

* Phloem.

1. **Account for the observation made after 3 months. (2mks)**

* Organic food being transported from the leaves down the stem accumulates and bulges on upper part; hindering transportation on the lower part where phloem is disconnected.

1. **State any one adaptation of the tissue named in 9 (b) above. (1mk)**

* Has companion cells to generate energy/ and co-ordinate activities of sieve tubes.
* Cytoplasmic filaments are continuous to ensure continuous flow of organic food substances;
* Sieve tubes lack cells organelles to contain/accommodate more cytoplasmic filaments;.
* Plasmodemata to link companion will to sieve tube.

1. **State two causes of coronary thrombosis. (2mks)**

* Accumulation of cholesterol; accept fats
* High intake of alcohol;
* Smoking cigarattes;

1. **State two roles of human blood other than transport. (2mks)**

* Thermoregulation.
* Blood clotting.
* Defence against microorganisms.
* Regulation of ph.
* Osmoregulation.
* Cell membrane.

1. **Name the surface of gaseous exchange in the following.**
2. **Paramecium (1mk)**

* Cell membrane.

1. **Terrestrial insects. (1mk)**

* Tracheole(s)

1. **frogs (1mk)**

* Lungs; buccal cavity; skin (any one)

1. The diagram below represents a structure for gaseous exchange in plants.
2. **Identify the structure illustrated above. (1mk)**

* Lenticel; reject lenticels

1. **Name the gas represented by X and Y. (2mks)**

X - Oxygen

Y – Carbon (iv) oxide

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)**

* Anaerobic respiration.

1. **In the above process name the chemical reaction represented by X. (1mk)**

* Glycolysis.

1. **Identify products Z in plants. (2mks)**

* Ethanol; carbon (iv) oxide; energy rej alcohol.

1. **Calculate the respiratory Quotient from the equation below. (2mks)**

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

Respiratory quotient =

= ;

= 0.70;

1. **Describe how plants compensate for their lack of an elaborate excretory system. (3mks)**

* They accumulate waste products very slowly.
* They recycle some of their waste products.
* They convert and store them in non toxic forms.
* Most wastes are in gaseous form which is released by simple diffusion

1. The figure below show a longitudinal cross – section through a mammalian kidney.
2. **Which part of the above section are the Bowman’s capsule found? (1mk)**

* A.

1. **The content of part labeled V were boiled with Benedict’s solution and an orange precipitate was formed.**
2. **Suggest the disorder the said person was suffering from. (1mk)**

* Diabetes mellitus.

1. **State the control measure to be taken to manage the disorder. (1mk)**

* Insulin injection.

1. Below is an illustration of an organisms captured by students during a practical lesson.
2. **Identify three features that enable the organism to be placed in the phylum Arthropoda. (3mks)**

* Jointed limbs/appendages.
* Body divided into (3parts) head, thorax and abdomen.
* Presence of antennae.
* Presence of walking legs.

1. **Explain why the organism will die when Vaseline is applied on its thorax. (1mk)**

* Gaseous exchange is through spiracles located on the abdomen.

1. Use the illustration below to answer questions that follow.
2. **Identify the type of pollution that has such effects. (1mk)**

* Water pollution.

1. **State two effects of the type of pollution identified in 19 (a) above to the organism. (2mks)**

* They clog the feathers inhabiting flight;
* They die when they ingest oil;
* Oil reduces entry of oxygen/purification of water;

1. **Name the causative agent of the following diseases. (2mks)**
2. **Typhoid**

* *Salmonella typhi*

1. **Tuberculosis.**

* *Mycobacterium tuberculosis*

1. 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)

* Population =

=

= 248; crickets

1. **Explain why biomass of organisms decrease at each preceding trophic level. (2mks)**

* Some energy is lost in form of heat;
* Some energy is used up during metabolism.
* Food is not fully utilized during egestion;
* Energy is lost when some organisms die;

1. The diagram below represents a stage during cell division.
2. **Identify the stage of cell division. (1mk)**

* Anaphase I reject anaphase (i)

1. **Describe the significance of prophase I. (2mks)**

* Leads to exchange of genetic materials; leading to numerous variations in living organisms;

1. State the functions of each of the following parts of male reproductive system.
2. **Sertoli cells. (1mk)**

* Nourishment of sperms.

1. **Epididymis (1mk)**

* Temporary storage and maturation of sperms.

1. **Seminiferous tubules. (1mk)**

* Lining cells divide to produce sperms.
* Have interstitial cells that produce testosterone.

1. The graph below shows the growth curve of an organism.
2. **Name the phase of growth labeled B and D. (2mks)**

* B – Exponential/log phase.
* D - Plateau phase

1. **Explain the reasons for the slow growth rate in phase A. (2mks)**

* Few number of cells dividing.
* Cells have not adjusted to the environment.