**MARKING SCHEME**

**TERM 2 2022 OPENER EXAM FORM 2**

**FORM TWO,2022**

**BIOLOGY. 70 MARKS.**

**TIME 2 HOURS.**

1. Distinguish between the following terms: - 4marks
2. Magnification and resolution of a microscope

**Magnification. Ability of a microscope to enlarge tiny objects**

**Resolution. Ability of a microscope to separate between two tiny structures under**

**magnification to appear distinct**

1. Mounting and staining of a specimen

**Mounting. The placing of prepared slide on stage of a microscope;**

**Staining. Use of chemical stain on specimen for clear observation**

1. Name the organelle that performs **each** of the following functions in a cell. 3marks
2. Transport of packaged glycoproteins

**Golgi bodies**

1. Destruction of worn out cell organelles

**lysosome**

1. Synthesis of proteins

**Ribosomes**

1. Given that the diameter of the field of view of a light microscope is 2000um. Calculate the

size of a cell in mm if 10 cells occupy the diameter of the field of view 2marks

**Size of one cell = diameter of field view**

**No. of cells arranged across the diameter**

**= 2000μm;**

**10cells**

**200μm = 0.2mm**

**N/B = 1μm = 0.001mms;**

1. State **three** physiological processes that are involved in movement of substances a cross the cell membrane 3marks

**Osmosis**

**Diffusion**

**Active transport**

1. The diagram below illustrates the behaviour of red blood cells when placed into two different

solutions **X** and **Y**.

Placed in solution

**X**

Placed in solution

**Y**

Process A

Process B

(a) Suggest the nature of solutions **X** and **Y**. 2marks

**X – hypotonic solution;**

**Y – hypertonic solution;**

(b) Name the process **A** and **B**. 2marks

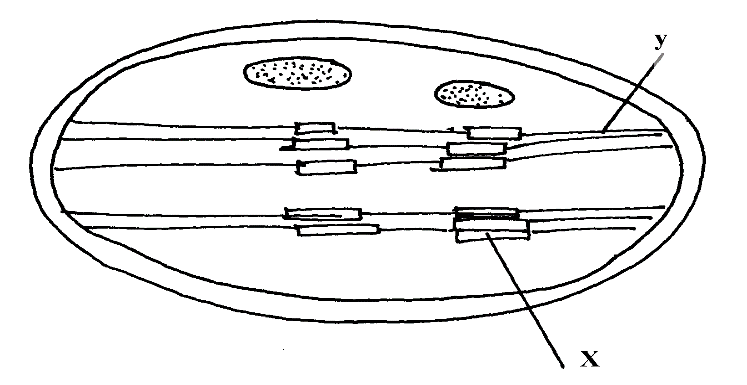
**A Haemolysis;**

**B – crenation**

(c) What would happen to normal blood cell if it were placed in an isotonic solution? 2marks

**The cell will maintain/retain its normal shape.**

1. The diagram below represents a cell organelle



i) Name the part labeled **Y 1mark**  **Inter grana**

ii) State the function of the part labeled **X** 1mark

**Accept site 4 photolysis; contains chlorophyll pigment that traps light;**

1. Briefly explain the fate of the following products from the light stage of the process of

Photosynthesis: 3 marks

**(a)** Oxygen atoms **combines to form oxygen gas used for respiration. The rest is diffused out during gaseous exchange**

**(b)** Hydrogen ions **enters the dark stage.**

**(**c) ATP **provides energy for carbon(IV) oxide fixation**

1. Name the diseases caused by deficiency of: 2marks
2. Iodine

**Goiter;**

1. Vitamin C

**Scurvy**

1. (a) What is peristalsis? 1 mark

**Involuntary movement of food along the alimentary canal**

1. Explain how the process above is brought about.

2marks

**Occurs when the Circular and longitudinal muscles on the wall of oesophagus and intestines contract and relax alternately;**

1. What are the **two** functions of bile salts during the process of digestion. 2marks

**Emulsification**

**Neutralization of acidic chyme**

1. The table below shows **three** enzymes **A, B** and **C** and their respective optimum pH.

|  |  |
| --- | --- |
| **Enzyme** | **Optimum pH** |
| A | 6.8 |
| B | 2.0 |
| C | 8.0 |
|  |  |

(a) (i) Name the most likely region of the alimentary canal of a mammal where enzyme

**B** would be found. 1 mark

**Stomach**

(ii) Give a reason for your answer in (a) (i) above 2marks

**Presence of hydrochloric acid in the stomach to provide acid conditions**

1. Study the dental formula given below:

**I 0; C 0; PM 3; M 2**

**4 0 3 3**

(a) Identify with reasons the mode of feeding of the animals whose dental formula is

given above

Mode 1mark

**Herbivorous**

Reasons 2marks

**Lack upper canine and upper incisors**

(b) Calculate the total number of teeth in the mouth of the above animal . Show your working.

2marks.

**15x 2 -= 30 teeth**

1. (a) Define the term transpiration 2marks

**Loss of water inform of water vapour from the plants mainly through the stomata.**

(b) State three types of transpiration 3marks

**Stomatal**

**Cuticular**

**lenticular**

(c) List **three** forces that facilitate the transport of water and mineral salts up the stem.

3marks

**Cohesion and adhesion**

**Capillarity**

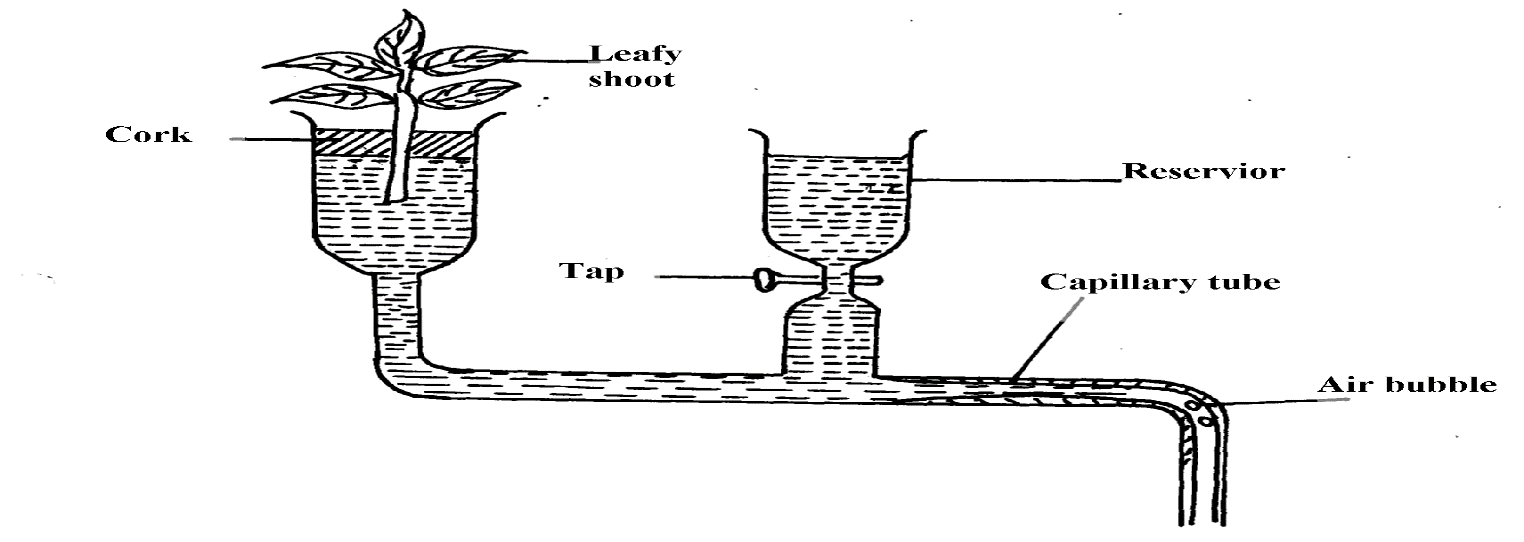
**Root pressure**

**Transpiration pull.**

(d) Name the tissue that is removed when the bark of a dicotyledonous plant is ringed

**phloem 1 mark**

1. The figure below represents a diagram of a photometer;



(a) What is the photometer used for? 1 mark

**To measure the rate of transpiration in leafy shoot.**

(b) give two precautions which should be taken when setting up a photometer 2marks

**Assemble apparatus under water;**

**Apply Vaseline between cork shoot contacts;**

**Open the reservoir tap;**

1. Name the blood vessel that nourishes the heart 1 mark  **Coronary Artery;**
2. In which form is oxygen transported in the blood. 1 mark

**Oxyhaemoglobin;**

1. (a) State **three** structural differences between arteries and veins in mammals 3 marks

|  |  |
| --- | --- |
| **Arteries** | **Veins** |
| **- Thick muscular**  **- No valves (except at the base of pulmonary artery and aorta)**  **- Narrow (small) lumen** | **- Thin muscular walls**  **- valves present;**  **- Wide (large) lumen;** |

(b) Name a disease that causes thickening and hardening of arteries 1 mark

**Arteriosclerosis**

1. Explain two advantages of closed circulatory system over open circulatory system. (2marks)

**oxygenated and deoxygenated blood are completely separated / do not mix;**

**Blood flow to organs is well regulated based on demand;**

**Animals tend to be more active due to efficient transport of gases and nutrients**

**Blood circulates over longer distances at faster rate due to high blood presence;**

***(mark any 2 correct)***

1. List the components of animal circulatory systems 3 marks

**system of blood vessels in which materials are circulated round the body**

**Blood, a fluid medium which contains dissolved substances and cells**

**The heart, a pumping mechanism which keeps blood in circulation**

1. Give two structural differences between a red blood cell and a white blood cell. 2 marks.

Red blood cells **• has haemoglobin • smaller size • lacks nucleus**

White blood cells **• not pigmented • larger size • nucleated**

1. (a) what is blood clotting? 1 mark

**process in which blood components clump together to prevent loss of blood from an injured/cut vessel**

(b)Name a protein, vitamin, and an enzyme involved in blood clotting. 3marks

**Protein – fibrinogen/prothrombin**

**Vitamin - k/quinine**

**Enzyme – thrombokinase/thromboplatin/thrombin**

1. (a) What is immunity? 1 mark

**Resistance to disease by organisms**

(b)Distinguish between natural and acquired immunity 2 marks

**Natural immunity is inherited/transmitted from parent to offspring/inborn/innate**

**Acquired immunity is developed after suffering from a disease or through vaccination**

1. What is the role of vaccination against certain diseases 1 mark?

**protect body against infectious diseases**

**prevent spread/transmission of certain diseases**