**BIOLOGY FORM TWO**

**END OF TERM 1 YEAR 2022 EXAM**

**MARKING SCHEME**

**Answer all the questions in the spaces provided.**

1. (a) State two functional differences between arteries and veins in mammals. (2 mks)

|  |  |
| --- | --- |
| **Arteries** | **Veins** |
| **Transport blood from hear to body tissues** | **Transports blood from body tissues to the heart** |
| **Transports oxygenated blood except pulmonary artery** | **Transport deoxygenated blood except pulmonary vein** |

(b) Differentiate between Arteriosclerosis and Atherosclerosis. (2 mks)

**Arteriosclerosis – hardening and narrowing of arteries due to deposition of calcium deposits on walls**

**Atherosclerosis – narrowing of arteries due to accumulation of cholesterol**

2. Distinguish between active and passive natural acquired immunity. (2 mks)

**Active natural acquired immunity – arises as a response to natural infection by a pathogen**

**Passive natural acquired immunity – are passed from mother to foetus through placenta or to**

**newborn through colostrums.**

3. Name the antigens and antibodies in human blood groups. (2 mks)

**Antigens: A and B**

**Antibodies a and b**

4. Explain why people with blood group O are referred to as universal donors while people with blood group AB are

universal recipients. (2 mks)

**Blood group O- They do not have antigens, which would react with recipient antibodies**

**Blood group AB – They don’t produce antibodies to react with donors antigens**

5. Outline two functions of each of the following structures of a cell

(a) plasmalemma. (2 mks)

**- Encloses all the cell organelles**

**- Gives shape to the cell**

**- protects the cell organelles**

(b) Golgi bodies (2 mks)

**- Transport and package the glycoproteins**

**- Forms the lysosomes**

(c) Centrioles (2 mks)

**- Involved in cell division**

**- Formation of cilia and flagella**

6. State the functions of the following parts of a light microscope.

**(a) Condenser - Concentrates light onto the stage (1 mk)**

**(b) Diaphragm- Regulates the amount of light passing through the condenser (1 mk)**

**(c) Course adjustment knob – Brings the image into rough focus by raising and lowering the body**

**tube. (1 mk)**

**(d) Fine adjustment knob – Brings the image into sharp focus by raising or lowering the body tube (1 mk)**

**(e) Eye piece- Contains a lens which contributes to the magnification of the image of the specimen**

**under view (1 mk)**

7. (a) Name the compound formed when carbon (II) oxide combines with haemoglobin: (1 mk)

**Caboxyhaemoglobin**

(b) Why would the compound named in (a) above lead to death? (2 mks)

**Caboxyhaemoglobin does not dissociate hence lowers the efficiency of haemoglobin to carry oxygen.**

(c) Name the substance that transports carbon (iv) oxide

**(i) Plasma – Hydrogen carbonate (1 mk)**

**(ii) Red blood cells - Haemoglobin (1 mk)**

8. (a) Distinguish between a single circulatory system and double circulatory system. (2 mks)

**Single circulation – blood flows through the heart once for a complete circulation while in Double**

**circulation blood flows through the heart twice for a complete circulation**

(b) Name a class whose members have a single circulatory system. (1 mk)

**Class Insecta: Class pisces**

(c) Name the openings to the chamber of the hearts of an insect. (1 mk)

**Ostia**

9. Outline two functions of lipids. (2 mks)

**- Oxidized to release energy**

**- Insulation**

**- Source of metabolic water**

10. (a) How are leucocytes adapted to their functions. (2 mks)

**They are amoeboid which enables them to engulf pathogens and move through the capillary wall**

(b) Name the blood vessel with highest concentration of:

**(i) Glucose – Hepatic portal vein (1 mk)**

**(ii) Carbon (Iv) oxide - Pulmonary artery (1 mk)**

11. The diagram below represents a transverse section through a plant organ.

(a) From which plant organ was the section obtained. (1mk)

**Monocotyledon root**

(b) Give two reasons for your answer in (a) above. (2 mks)

**- Has root hairs**

**- Xylem and phloem tissues are in groups alternatively in a ring**

**- Has a pith**

(c) Name the parts labeled M, N, P and Q. (4 mks)

**M – Epidermis**

**N – Phloem**

**P – Xylem**

**Q – Root hair (reject root)**

(d) State two functions of part labeled Q. (2 mks)

**- Absorption of water and mineral salts**

**- Anchorage**

(e) How is part Q adapted to its function? (3 mks)

**- Are numerous to increase SA for absorption of water and mineral salts**

**- Many mitochondria to supply energy for active upstate of mineral salts.**

**- Thin walled to allow rapid movement of materials**

12. State three factors that cause decrease in rate of transpiration from leaves. (3 mks)

**- Low temperature**

**- low light intensity**

**- high humidity**

**- high atmospheric pressure**

**- decrease in soil water**

13. A student observed a row of 16 epidermal cells in a microscopic field that was 8mm in diameter. Calculate the average length of each cell in micrometers. (2 mks)  
**` Diameter of field of view = 8mm x 1000um = 8000um**

**Length of a cell = Diameter = 8000**

**Number of cells 16**

**= 500um**

14. (a) Give the formula of working out the magnification of a microscope. (1 mk)

**Eye piece magnification x objective lens magnification**

(b) Calculate the magnification that is obtained when an object is viewed with a X20 eyepiece and x80

objective. (2 mks)

**= X20 x X80**

**= X1600**

15. Name the organelles that are involved in the following:-

(a) forms secretory vesicles- **Golgi bodies/apparatus** (1 mk)

(b) Involved in cell division and formation of cilia and flagella. (1 mk)

**centrioles**

(c) formation of ATP - **Mitochondrion** (1 mk)

(d) fixation of carbon (Iv) oxide to form sugars - **Chloroplasts** (1 mk)

(e) detoxification – **smooth Endoplasmic reticulum** (1 mk)

16. Differentiate between Active transport and Osmosis. (2 mks)

**Osmosis – movement of water molecules from a region of high concentrated area to low concentrated are across a semi-permeable membrane.**

17. State three roles of active transport in human body. (3 mks)

**- Re-absorption of sugars and salts in kidney tubules**

**- Absorption of digested food from ileum to the bloodstream**

**- Pumping of ions by the Na+/K+ across nerve cell membrane.**

Active transport – **movement of molecules /ions from a region where they are at a lower concentration to a region of higher concentration with help of energy/ATP.**

18. (a) Define gaseous exchange. (1 mk)

**Is the process by which the respiratory gases are passed across the respiratory surface eg O2 (Oxygen**

**and carbon (iv) oxides)**

(b) Explain four adaptive characteristic features of respiratory surfaces. (4 mks)

**- Have a thin epithelium for rapid diffusion of gases**

**- Have large surface area for rapid diffusion of gases**

**- well vascularised to transport diffusing gases**

**- Have a moist surface to enhance diffusion.**