

Candidate Name:..... MARKING SCHEME.....


MINISTRY OF GENERAL EDUCATION
BENEOT ACADEMIC INIATIVE
End of Term One Examination
 Grade 12

Biology 5090/2
 Paper 2 16th April, 2021

Addition Materials:
 Soft clean eraser
 Soft pencil (type B or HB is recommended)

Time 1 hour 45minutes

Instructions to candidates
 There are **two** sections in the paper **A and B**. Answer all questions in section **A** within the spaces in the paper. Choose **three** questions from Section **B**



Section A. [44 mark]

Answer all the questions in the spaces provided in this paper

1. Complete table 1.0 showing the part of the microscope and their functions

a.

PART	FUNCTION
(i) <i>Mirror</i>	Collects and reflects onto specimen on the stage
Diaphragm	(ii) <i>Regulate the amount of light that reaches the stage during examination of specimen</i>
(iii) <i>Objective lenses</i>	Magnifies image further
Stage	(iv) <i>this is where specimen is placed during examination. It hold the specimen during examination</i>
(v) <i>Fine adjustment knob</i>	Brings the image into sharp focus especially when the image is viewed at high magnification

Table 1.0

[5]

b. State three parts of the plant cell that can be seen under light compound microscope

(i) Cytoplasm, Nucleus, Cell membrane, Cell wall, Food vacuole, Chloroplast**[3]**

Total: 8marks

2. **Figure 1.0** shows a plant cell.

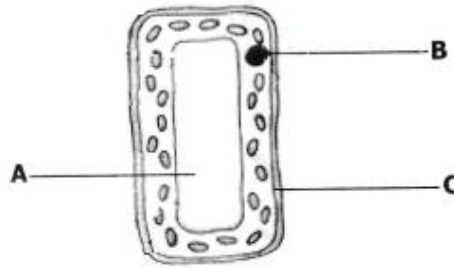


Figure 1.0

(a) (i) Name the parts labelled **A**, **B** and **C**.

- A** *Food vacuole*..... [1]
B *Nucleus*..... [1]
C *Cell membrane*..... [1]

(ii) Name the organ in the plant in which **figure 1.0** is found.
 Give a reason for your answer.

Organ of plant..... *Leaf*
it has numerous chloroplast which contain a green pigment
Reason..... *called chlorophyll which traps light energy needed for*
photosynthesis..... [2]

(b) Describe **two** adaptations of the cell in **figure 1.0** which enable it to carryout its functions.

- Adaptation 1** *Presence of numerous chloroplast*..... [1]
Adaptation 2 *It is long vertically which make the chloroplast inside to move following the source of light*..... [1]

(c) Explain what would happen to the cell in **figure 1.0** above, if it was placed in a test tube containing distilled water.

it will gain water and the protoplasm will pull out of the cell wall in the process known as turgidity and it will become turgid..... [2]

[Total: 9]

3. **Figure 2.0** below shows the internal structure of a tooth.

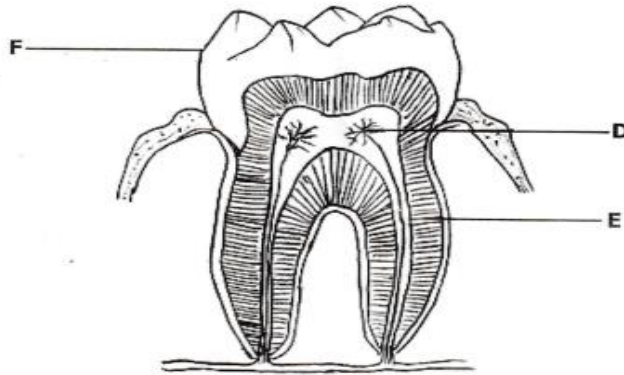
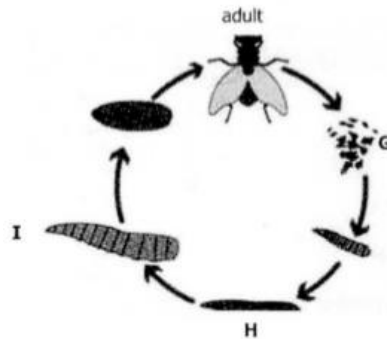


Figure 2.0

- (a) Name the parts labelled **D** and **E** in **figure 2.0** above.
- D** *Nerves* [1]
- E** *Dentine* [1]
- (b) (i) Explain what happens to the part labelled **F** during tooth decay.
Part in the Enamel, it will corroded or dissolved produced by the acid and bacteria. This occurs when sweet food are eaten and the person forget to brush, so the bacteria will start eating the working on food particle that has remained thereby producing acid [3]
- (ii) Looking at the shape of the tooth in **figure 2.0** above, suggest the role it plays in the digestion of food.
it crushes and grinds the food so as to increase the surface area for the action of enzyme activity [1]
- (c) Complete the human dental formula below by filling in the missing numbers **G**, **H** and **J**.
- $$G \left(\begin{array}{c} i \\ 2 \end{array} \frac{2}{2} c \frac{1}{H} pm \frac{2}{2} m \frac{J}{3} \right) = 32$$
- G** 2 [1]
- H** 1 [1]
- J** 3 [1]
- [Total: 9]**

4. **Figure 3.1** shows the life cycle of a house fly



a) (i) Identify the stages labelled **G** and **H**

Stage G: *Egg*

Stage H: *Larvae* [2]

(ii) Explain the changes taking place during stage **I**

..... *At this this stage the larva grows to the pupa. There is a lot of metabolic processes that takes place inside the puparium case. The pupa develops the two com pound eyes, two pairs of wings and the legs. Eventually the pupa develops sexually fully. Thereafter, the puparium case breaks and an adult fly escapes.* [3]

b) (i) Which stage in Figure 3.1 would be the most effective for eradication houseflies?

..... *Stage G and H. at this stage, the eggs are easily destroyed and larva are also killed because that are less mobile within the stagnant water.* [2]

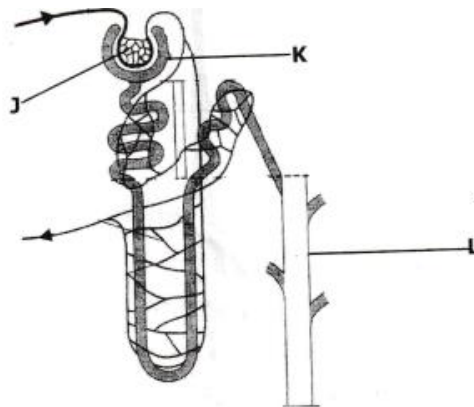
(ii). using a named example, describe the role a housefly in disease transmission

..... *Cholera is caused by the housefly which carries the pathogens on its external body surfaces.* [2]

[Total: 9]

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5. **Figure 4.0**, shows a section through a nephron



(a) Name the parts labelled **J**, **K** and **L**

J: Glomerulus [1]

K: Bowman's capsule [1]

L: Collecting duct [1]

(b) (i) Identify **three** substances that are not filtered at **J**

Plasma proteins

Platelets

Blood cells (White and Red blood cells) [3]

(c) Suggest what would happen at **J** if the coiling of the blood capillary was increased

Name the hormone that causes reabsorption of water in the kidney and the organ where they are produced

Hormone: Antidiuretic Hormone or Vasopressin [1]

Organ: Pituitary gland [1]

Total: 9 marks

Section B [36 marks]

Answer three questions only on a separate answer sheet

6. (a) Describe the internal adaptation of features of a leaf to the process of photosynthesis

*The presence of **waxy cuticle**, this prevent excess loss water by the process of transpiration which is needed in the process of photosynthesis. The shiny surface also reflect light.*

***Thin lamina** for easy penetration of light energy need for the process of photolysis (needed to split water molecules into hydrogens ions and oxygen)*

*Presence of numerous **palisade cells** and **mesophyll** cells which contains chloroplast made of green pigment called chlorophyll which traps light energy needed for photolysis. The chloroplast contains the grana and thylakoid where light and dark reaction occurs.*

*Presence of **air spaces** for gaseous exchange within the leaf and **vascular bundle** (xylem and phloem) to transport water and food. The presence of the **guard cell** which contain chloroplast and controls the size of the **stoma**. [8]*

- (b) Explain four factors that affect the rate of transpiration

***Temperature**- the higher the temperature the faster the rate of transpiration*

***Humidity**- the higher the humidity the slower the rate of transpiration because the level of water in the atmosphere in higher than in the leaf and vice versa*

***Wind speed**- the faster the speed of wind the faster the rate of transpiration because the vapour on the leaf surface will be blown off easily and vice-versa*

***Light intensity**- the higher the light intensity the faster the rate of transpiration because the stoma opens and vice-versa [4]*

[Total: 12]

7. (a) Describe the main functions of the components of blood

***Blood Plasma**- its liquid part of the blood that made up of water, dissolved food and minerals salt. The blood plasma is a where all substances dissolve.*

***Plasma protein**- responsible in blood clotting, maintaining blood viscosity and maintaining constant blood Ph. Plasma proteins is also responsible in transportation of dissolved food, metabolic wastes, hormones, antibodies, antitoxins and distribution of heat around the body.*

***Platelets (thrombocytes)** - this contain protein that are responsible in blood clotting such Thrombokinase. This prevent excess loss of blood.*

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Blood cells- red blood cells are responsible in transporting oxygen and carbon dioxide. The white blood cells defend the body against infection through engulfing and producing antibodies and antitoxins. [8]

(b) Explain sickle cell and haemophilia as blood disorder in a human being

Sickle cell anaemia-this is caused by abnormal production of haemoglobin in the red blood cell

Haemophilia-this is caused by lacking of blood clotting factor VII and IX. This condition makes the results in poor clotting and prolong bleeding. [4]

Total: 12 marks

8. Describe malaria as a disease under the followings

(a) causative agent,

Female Mosquito called Anopheles which transmit a protozoon called Plasmodium [1]

(b) signs and symptoms

Headache;

Fever;

Anaemia;

Pain in muscles and joints;

Shivering and sweating [7]

(c) method of transmission and control

Malaria is transmitted by bites from a female Anopheles mosquito

Malaria can be treated with antimalarial drugs; controlling or killing of mosquitoes; preventing mosquito bites [5]

[Total: 12]

9. (a) Define the term puberty

This is the onset of sexual maturation [2]

(b) Describe changes that occur at puberty to both boys and girls

Both girls and boys start to produces the reproductive gametes that's ovum and sperms

Both girls and boys have their sexual organs grow and develop the pubic hair around their genital areas.

Both girls and boys develop pubic in the armpits

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Both girls and boys have sexual growth and the body changes. [8]

(c) Describe **two** determinants of Puberty

Diet-the type of food a person eat has an influence on the sexual development.

Hormonal- production of hormones such progesterone, oestrogen and testosterone.[2]

[Total: 12]

10. (a) Explain the mechanism of the skin in thermoregulation [6]

(i) when the body is in cold environment

***Erector muscles** contract, pulling the hairs upright. The erect hair traps a layer of air which insulates the skin against heat loss. The contraction of hair erector muscles leads to development of goose bumps on the skin in cold weather.*

***Vasoconstriction** (narrowing of skin arterioles) occurs to reduce the amount of blood passing through the skin. This reduces heat loss.*

***Shunt vessels open**, reducing the amount of blood passing through superficial vessels near the skin surface. This reduces heat loss.*

***Sweat glands** become less active or inactive to minimise loss of heat which might occur through sweating.*

(ii) when the body in hot environment

***Erector muscles relax**, causing the hair to lie on the skin. This increases heat loss from the body by conduction since no layer of still air forms*

***Vasodilation** (widening of skin arterioles) occurs, increasing the amount of blood passing through the skin. This allows more heat to be lost from the blood by conduction.*

***Shunt vessels close**, allowing more blood to pass through superficial vessels near the skin surface. This increases heat loss from the body.*

***Sweat glands** become more active and produce more sweat. The water in sweat absorbs heat from the body in order to evaporate, thereby cooling the body.*

(b) Discuss the meaning of the following terms [6]

(i) Excretion

is the removal of toxic metabolic wastes from the body.

(ii) Homeostasis

This is defined as the maintenance of a constant internal environment.

(iii)Diabetes mellitus

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-Is the disease caused by lack or insufficient production of insulin. Diabetes has the following signs and symptoms include the following; High levels of glucose in blood (hyperglycemia), glucose in urine (glucosuria), persistent thirst leading to excessive intake of water, drastic loss of weight, loss of sensation in some body parts. When

[Total: 12]

11. (a) Describe the health risks associated with foetal development in humans

*If the mother's blood comes in contact with the fetus blood, the baby will suffer from **haemolytic disease (erythroblastosis foetalis)** - this occurs if the woman conceives another rhesus positive foetus, these antibodies will cross the placenta and attack the blood of the foetus, which leads to death if the baby does not receive a comprehensive blood transfusion soon after birth.*

***Nutritional diseases**-where the mother lacks one of the six essential nutrients, and this can result in miscarriage.*

Any subsequent pregnancies are miscarried and fail to thrive up to the time of birth.

***Foetal alcoholic syndrome (FAS)**-is the condition caused by excess intake of alcohol by a pregnant woman, alcohol makes a baby be born with a condition which is characterized by mental retardation and deformation of the baby. [4]*

(b). Describe benefits and possible risks of contraceptive pills and injections

Benefits-

- *Prevent unwanted pregnancy*
- *Give the mother time to recover from the effects of giving birth before she can have another child.*
- *Ensuring each child receives enough nutrition, shelter, clothing, education and attention.[4]*

Possible Risks

Have side effects such as interfering with the pattern of the menstrual cycle, nausea and weight gain

Irritation-where a person develops allergies

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(c). Explain other methods of birth control in humans apart from the use of contraceptive pills and injections

Withdrawal Method: *This is the removal of the penis from the vagina just before ejaculation. It is an unreliable method because the fluids that a man releases before ejaculation contain traces of spermatozoa that may still fertilize an ovum.*

Rhythm Method: *This is a contraceptive method where a couple only copulates during the safe period of the menstrual cycle when fertilization is less likely to occur.*

Condoms: *A condom is a thin latex sheath that is fitted around an erect penis or inserted into the vagina before intercourse so as to keep semen from being deposited directly into the vagina.*

Diaphragm (cap): *This is a thin latex cap fitted over the cervix before intercourse so as to block spermatozoa from entering the uterus. It is more reliable if used in conjunction with spermicides. Initially, the diaphragm must be fitted by a doctor.*

Intra-uterine Device (IUD): *This is a device made of plastic and copper wire that is inserted into the uterus to prevent implantation by irritating the lining of the uterus. The device can only be fitted by experts and it may cause discomfort if wrongly placed.*

Spermicides: *These are chemical substances that are applied inside the vagina before sexual intercourse in order to kill spermatozoa. They are normally used together with the diaphragm.*

Hormones: *Hormones such as oestrogen and progesterone are administered in the form of pills or injections to prevent ovulation and implantation. They are only reliable if taken according to prescription and may have side effects such as interfering with the pattern of the menstrual cycle, nausea and weight gain*

[4]

[Total: 12]