



CEKENAS END OF TERM I EXAM-2022

FORM FOUR EXAM

Kenya Certificate of Secondary Education.(K.C.S.E)

MARKING SCHEME

BIOLOGY PAPER 1 (231/1)

1.a) This is a part of an organism or the whole organism selected for detailed scientific study.

b) -Saves time during studies

- Enhances detailed study of biological concepts

2. - The female lays many eggs hence increases the sample size for study.

- Have many observable characteristics that are distinct and contrasting.

- It is easily bred in the laboratory with minimum requirements.

- Has a short generation time (life span) of 10-13 days hence a short study period.

- Offspring can easily be selfed and also be crossed with their parents easily (backcrossing)

- The flies are safe to handle because they do not transmit any known human disease.

3. Magnification power

Resolution power

4. a. Gaseous exchange

b. Stomata

c. Aquatic plants have stomata on the upper part of the leaves; to increase high rate of transpiration to encourage excess loss of excess water;

5. Hydrolysis — process by which complex molecules are broken to simpler molecules;

While, condensation is the process by which simple molecules are combined to form complex compounds with formation of water.

6.a) Premolars and molars

b) Organisms with heterodont dentition can feed on a variety of diet.

c) Enzyme — sucrase

Final product — glucose and fructose

7.a. i) Endodermis

ii) Has starch grains which turns blue black when stained with iodine solution

b) -Sunken stomata

- Reversed stomatal rhythm

- Midday closure

- Reduced number of stomata on upper surface of the leaf; (first two correct points)

8.a. Respiratory quotient (RQ) is a ratio showing the relationship between the amounts of carbon (IV) oxide used against the amount of oxygen used in respiration.

b. Oxygen produced by photosynthesis process is used for respiration and the carbon (IV) oxide produced in respiration is utilized in photosynthesis

9.

Character	Monocot	Dicot
a) Number of stamens	In multiple of three	Multiples of 4/5
b) Arrangement of vascular bundle in stem	Vascular bundle are scattered	Vascular bundle arranged in a ring
c) Type of root	fibrous	Tap root

10.a) Blood capillaries

b) -Their walls are made up of one cell thick therefore providing a short distance for exchange of substances.

-Narrow lumen to creating high pressure which forces the fluid part of the blood to filter out of through the capillary walls (ultra filtration) into the intercellular space forming the tissue fluid

-Highly divided to increase the surface area for exchanging materials

c) Venule

11.a) Dioecious plant — plant with separate sexes, i.e has either male or female reproductive organ; monoecious — plant with both male and female flowers borne on the same plant.

12.a) Food stored in the cotyledon is hydrolysed and transported to the plumule is used in growth of the shoot which leads to an increase in weight

b) -Enables them to survive adverse environmental condition

-Non-feeding stage therefore reduces competition for food among insects

- Allow for extensive breakdown and reorganization of tissues to give rise to an adult/imago. (First three points) (3 mks)

13.i) Chiasmata formation

ii) Leads to exchange of genetic materials which causes variation in organisms

iii) Chromosomal mutation-Translocation mutation

14.a) Fish net Rej. Fishing net

- Water proof ink

- Data collection Notebook

b) - Can lead to underestimation/overestimation

- Birth/death may occur before second capture is done

- Method marking may interfere with organisms way of life

15.a) Q- Arid and semi-arid

W- Aquatic

b) Ammonia

c) To increase the surface area for reabsorption of water in the kidney tubules for them to conserve water.

16.i) Synthesis and maturation of sperms

ii) Stimulates the maturation of Graafian follicle

17.a) Phloem

Epidermis

b) - Increased risk of infections

- Inability to translocate manufactured food downward the plant.

c) Swelling on the upper part of the ring; since ringing removed the phloem; hence manufactured food is not translocated downwards

18.

a) i) T—G— C—T—C— T—A—T—G

ii) U—G—C—U—C—U—A— U—G

b) Ribosomes

c) -Turner's syndrome

- Down's syndrome

- Klinefelter's syndrome

19. a) Keep the trachea open preventing them from collapsing;

b) Maintain a high rate of diffusion of respiratory gases for maximum gaseous exchange;

c) When fish is lifted out of water, the gills filaments clumps together; reducing their surface area; for gaseous exchange; (this causes death) /

Also in air, the moisture evaporates fast from the gill filaments; since gaseous exchange requires moist surfaces; the diffusion of oxygen and carbon (IV) oxide cannot take place;

20. The acquired characteristics are not inherited; since the traits are found in somatic cells only

21. a) Ecology

b) Virology

c) They will become extinct with time

22.i) To kill the protoplasm/stop any enzymatic reaction that could use starch

ii) Remove starch that was initially present thus ensuring that starch if present can only be attributed to factor under investigation.

iii) To remove chlorophyll from the leaf to track colour changes when iodine solution is added.

23. Involves movement of water molecules **only** from a region of high water concentration to region of low water concentration through a semi-permeable membrane.

24. -Granulocytes and monocytes engulf the pathogens destroying them.

- Lymphocytes produce antibodies which destroys the pathogens.

-Platelets enhance the clotting process to occur thus preventing entry of pathogens.

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