

NAME..... ADM NO.....CLASS.....

231/1

BIOLOGY (Theory)

FORM 3

END OF TERM 3 - 2024

TIME: $2\frac{1}{2}$ Hours

MARKING SCHEME

1. Define the following terms

i) Inter specific competition

1mk

Competition between individuals of different species;

ii) Carrying capacity

1mk

This the maximum number of organisms an area can comfortably support without depletion of the available resources;

2. Plasmodium ovale and plasmodium falciparum are transmitted by mosquito

a) Identify the mistake made in writing the scientific.

The genus names started with capital letters.

1mk

b) Can the following organism interbreed? Give reason

2mks

No; Do not belong to same species;

3. Below is a dental formula of certain organism . use it to answer the question that follows:-

i $\frac{0}{3}$ c $\frac{0}{1}$ pm $\frac{3}{2}$ m $\frac{3}{3}$

i) ***Calculate the total number of teeth in the Mouth of the organism***

2mks

$$6 \times 2 = 12$$

$$9 \times 2 = 18$$

30 teeth;

ii) Name the Organism

Herbivore;

iii) Identify the mode of nutrition of the organism

1mk

Herbivory/Herbivorous;

4. Explain what happens during the darks stage of photosynthesis

2mks

The process involves carbon(iv)oxide with hydrogen atoms, which combine; to form a simple sugar such as glucose; (2mks)

5. List three characteristics of a population

3mks

Density;

Dispersion;

Population growth/rate;

6. What characteristics of organisms is described below

a) A cat giving birth to kittens and eating them.

(2marks)

Reproduction; and nutrition;

b) A boy running to class at the sound of a bell.

(1mark)

Irritability; reject sensitivity

7. The diagram below represents an apparatus used to collect specimen for study.



a) Identify the apparatus.

(1mark)

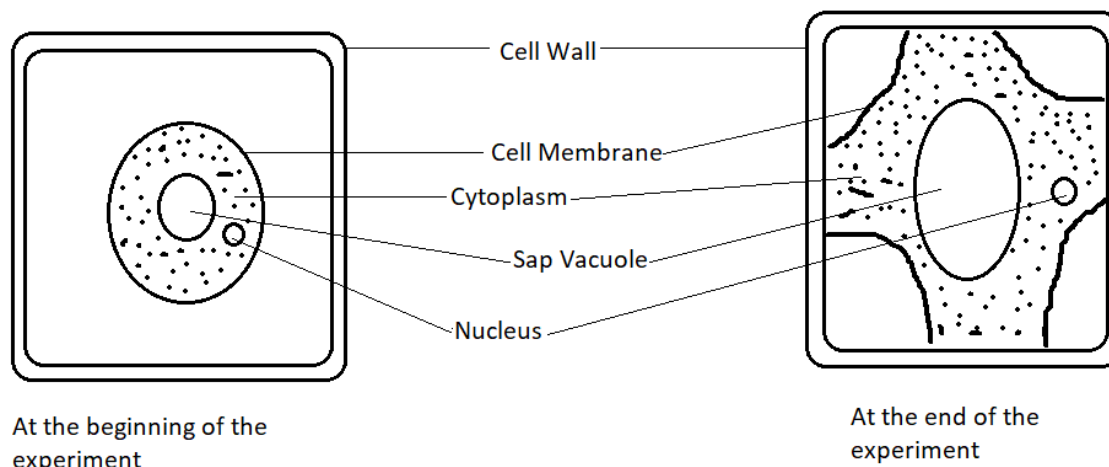
A pair of forceps/tweezers;

b) Name one specimen where the use of the apparatus is recommended.

(1mark)

centipedes, spiders, stinging nettle; accept suitable examples.

8. Below is a plant cell that was immersed in solution K. study it and answer the questions that follows.



a) State the nature of solution K.

(1mark)

Hypotonic solution/ lowly concentrated solution/distilled water;

b) Account for the observation made at the end of the experiment.

(2marks)

The sap vacuole enlarged in size; this is because if a plant cell is placed in solution K, the water moves into the cell by osmosis; and cause the cell wall to distend.

c) State the term given to the process that resulted to the observation. (1mark)

Deplasmolysis;

9. (a) Explain the role of oxygen in Active transport. (1mark)

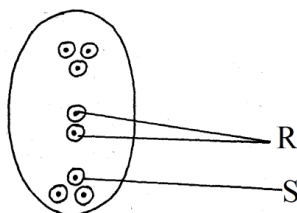
To oxidise/breakdown food substances to generate energy;

b) Name two processes that depend on Active transport in animals. (2marks)

Reabsorption of nutrients at the kidney tubules;

Absorption of nutrients at the ileum;

10. (a) Study the diagram of the embryo sac below and answer questions that follow.



a) Name the type of fertilization that occurs in the embryo sac. (1mark)

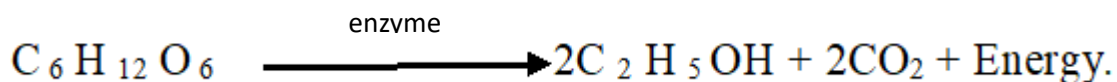
Double fertilization;

b) What do the structure labelled R and S develop into after fertilization? (2marks)

R- primary endosperm;

S - Zygote/Embryo;

11. a. The process that occurs in plants is represented by the equation below:



a) Name the process (1mk)

Anaerobic respiration;

b) State **two** economic importance of the named process in (a) above. (2mks)

Brewing/dairy/sewage treatment/biogas manufacture;

Any two that are right

12. Name **two** nerves that control the rate of heartbeat (2mks)

Parasympathetic/Vagus nerve that slows down the heartbeat;

Sympathetic nerve speeds up heartbeat.

13. A doctor performing an operation cut two blood vessels by mistake. He notices that from one of the blood vessels, blood spurts out while from the other, blood flows out steadily.

(a) Identify the type of each blood vessel in which;

(i) Blood spurts out (1mk)

Artery;

(ii) Blood flows smoothly (1mk)

Vein;

(b) Give a reason for your answer in (a) above (2mks)

(i) Blood flows under high pressure;

(ii) Blood flows under low pressure;

14. Give reasons why muscle cells, sperm cells and kidney cells have large numbers of mitochondria. (2mks)

To generate energy for their functioning;

(b) State the role of cristae found in the mitochondria. (1 mk)

To increase surface area for respiration;

15. State how xylem vessel is adapted to its function (2mks)

There walls are strengthened by deposition of lignin material to ensure they do not collapse;

Hollow and narrow lumen to aid capillarity;

16. Define the term immunity. (1mk)

Is the ability of an animal to resist infection or counter the effects of toxics produced by the antigens;

b) Distinguish between natural immunity and acquired immunity. (1mk)

Natural immunity is passed on from to offspring; while acquired is immunity to particular infections developed in the animal's life as it interact with its environments;

c) Identify two immunizable diseases in Kenya. (2mk)

Smallpox; tuberculosis; poliomyelitis; Tetanus; accept correct spellings

d) Give a reason why active immunity is advantageous. (1mk)

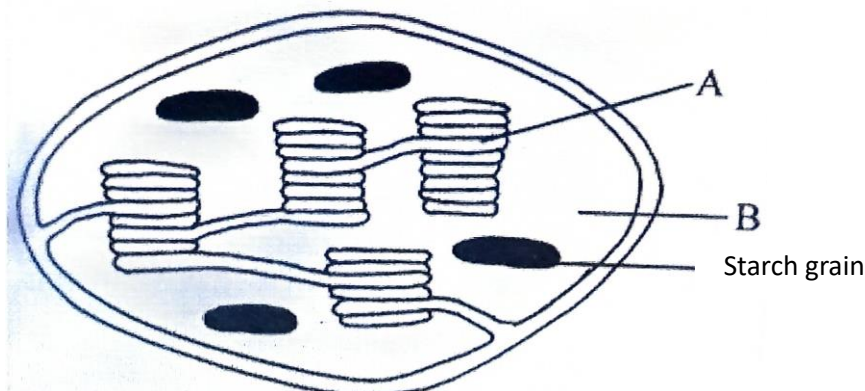
Diseases/infections does not reccur/reoccur;

e) Josephine had an accident leading to damaged tissue and the medical doctors advised for use of autografts but not xenograft for an operation to replace damaged tissue.

Explain. (2mks)

An autograft will be obtained from the self of the same person while a xenograft involves transplant from other animal species;

17. The diagram below represents a plant cell organelle;



a) Name the organelle (1mk)

Chloroplast;

b) In which of the labeled parts does carbon(IV)oxide fixation occur? (1mk)

B; reject stroma

c) Name the parts labeled A and B and state how each is adapted to its function (4mks)

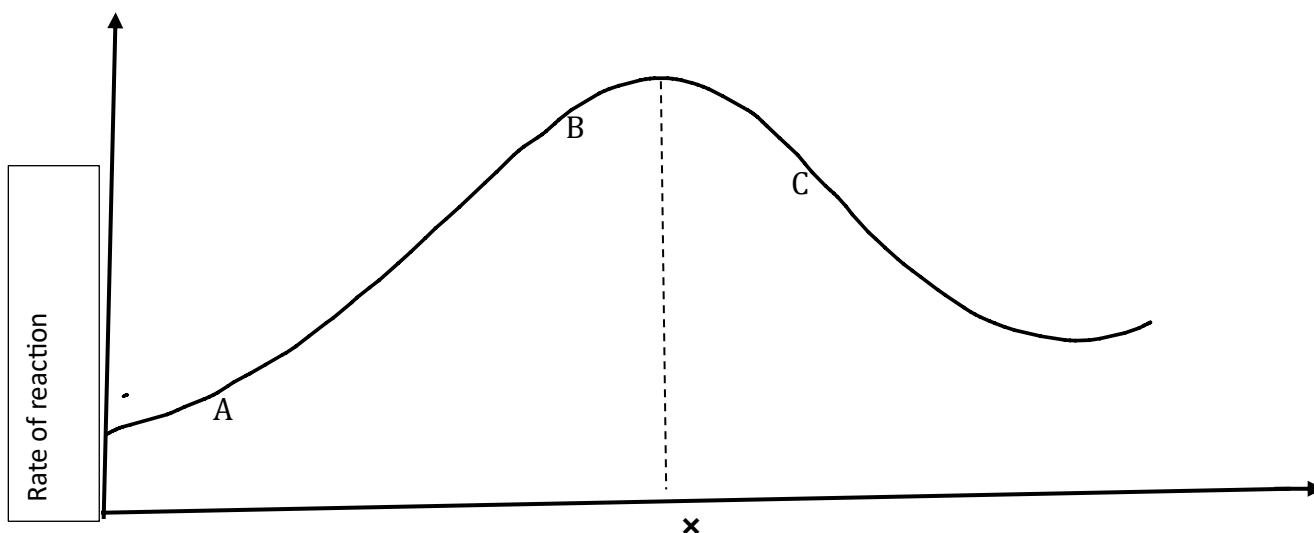
A - Granum; site for the light stage of photosynthetic (photolysis);

B - Stroma; where the dark stage occurs; /(Carbon(iv) oxide fixation occurs);

d) Explain what would have happened to the structure labeled X had the plant been kept in darkness for 48 hours after a starch test. (2mks)

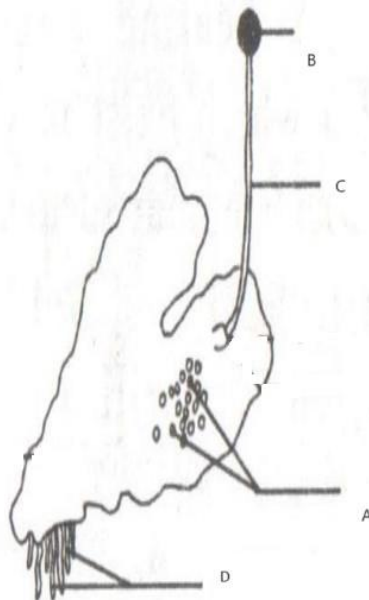
All the starch would have been depleted/destarched; and retained the brown colour of iodine solution;

18. The Figure below shows the effect of temperature on an Enzyme – catalyzed reaction



- a) Account for the shape of the Graph;
 i) Between points A and B. 2mks
Rapid/fast increase in the rate of reactions; as temperature increases the rate of reaction increases;
 ii) Beyond C 2mks
The rate of reaction slows down beyond optimum temperatures; as high temperatures denatures/destroys the enzymes;
- b) What is point X 1mk
The optimum temperature;
- c) Name two other factors that affect the enzymes catalyzed reaction 2mks
PH;
Substrate concentration and enzyme concentration;
Enzyme factors and co-enzymes;
Enzyme inhibitors;
- d) State the enzyme found in living tissues that breaks down hydrogen peroxide (1mk)
Catalase;

19. The Diagram below represents a certain organism observed by a student in an ecological tour



- a) Name the parts labeled C and D 2mks

C – *Seta;*

D- *Rhizoids; reject singular*

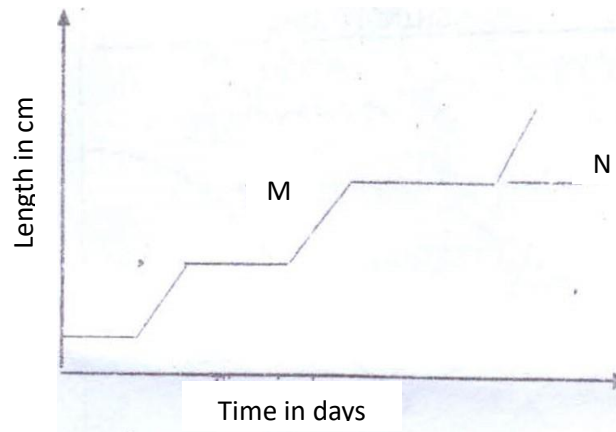
- (b) Name the division to which the organism belongs 1mks

Bryophyta; reject Bryophytes

- c. Give the observable reason for your answer in (b) above 2mks

***Are Thalloid/differentiated into simple leaf – like and stem like structures;
Presence of rhizoids;***

20. The diagram below represents growth patterns in a certain group of animals. Study it and answer the questions that follow.



- a) What name is given to such a growth pattern as shown above? (1 mark)
Intermittent growth curve/discontinuous growth curve;

- b) Suggests the animal, phylum whose growth pattern is represented (1 mark)
Phylum Arthropodai;

- c) Name the process that occur in each of the parts labelled. (2 marks)
M- Cell division within cells;

N – Growth;(by expansion of the divided cells.)

21. (a) Flagelum; (1mk)
(b) Cillia; (1mk)

22. (i) Ammonia; (1mk)
(ii) Uric acid; (1mk)
(iii) Urea; (1mk)