PIVOT POINT REVISION

MAGIC BULLETS 2011

BIOLOGY PAPER

1

SAMPLE 1

231/1

BIOLOGY

THEORY

1. State the branch of biology that would be used in solving the problem of disputed parentage (1mk)

2) (i) Name one enzyme found in living tissue of plants and animals. (1mk)

(ii) Give the function of the named enzyme above. (1mk)

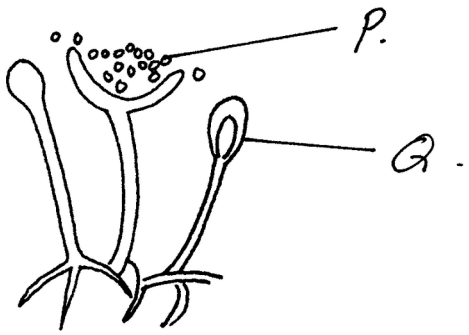
3. State one advantage of wilting in plants (1mk)

4. Name three sites where gaseous exchange takes place in terrestrial plants. (3mks)

5. What's the importance of phototropism responses in plants.
(1mk)

6. State two theories of the origin of life (2mks)

7. The diagram represents a bread mould growing on damp bread.



a) Name the structure labeled P & Q. (2mks)

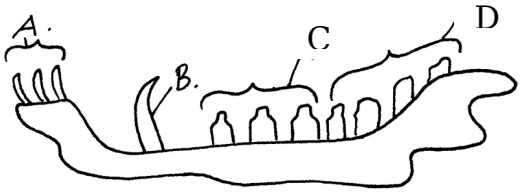
b) Identify the kingdom to which it belongs.
(1mk)

8. List the changes that take place during inhalation in mammals in the following

(i) Ribcage.
(1mk)

(ii) Diaphragm (1mk)

9. The diagram below shows half the lower jaw of a mammal.



a) Name the kind of teeth labeled

A and C (2mks)

10. List two characteristics features of alveoli to its function.
(2mks)

11. State the functions of the mammalian ear.
(2mks)

12. Name the cell organelles responsible for

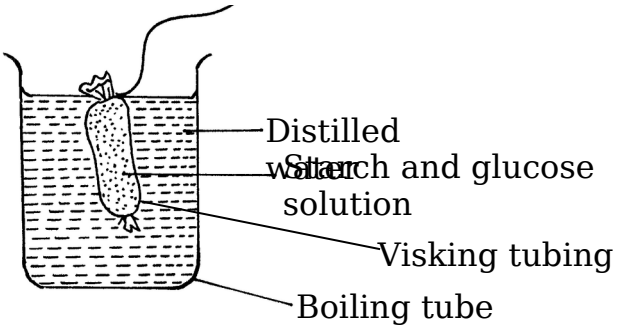
(i) Respiration (1mk)

(ii) Photosynthesis
(1mk)

(b) Which part is useful in maintaining support in herbaceous plants

(1mk)

13. An experiment set-up shown below was to investigate a certain process.



(Experimental set-up)

After 20 minutes, a student tested the sample from the boiling tube for starch and glucose and recorded the results as shown in the table.

Time (Min)	Start	After 20 minutes
Starch	Absent	Absent
Glucose	Absent	present

a) Explain the presence of glucose in the water sample.

(1mk)

b) What change occurred in the volume of liquid in

(i) The boiling tube

(1mk)

(ii) The visking tube

(1mk)

14. State two methods of preventing malaria.

(2mks)

15. State two functions of the synovial fluid in a hinge joint.

(2mks)

16. Name the factors in seeds that cause dormancy.

(3mks)

17. Name the hormone responsible for

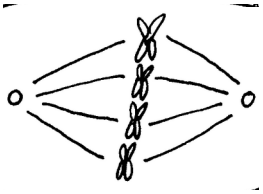
a) Conversion of glycogen to glucose

(1mk)

b) Regulation of the amount of water in the blood.

(1mk)

18. The diagram below shows a cell undergoing mitosis.



a) Name a region in a flowering plants where this cell division takes place. (1mk)

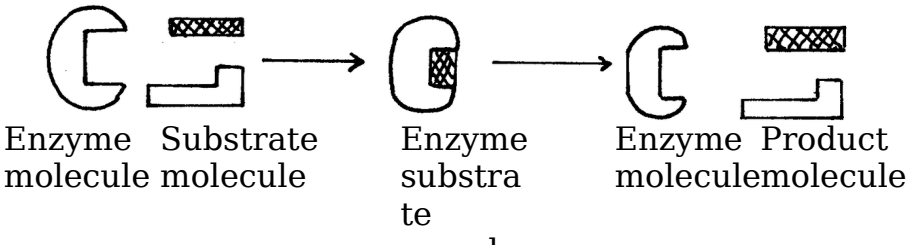
b) (i) Name the stage of cell division represented by the diagram.
(1mk)

19. Explain the meaning of the term 'survival of the fittest'
(2mks)

20. Name three components of DNA molecule.
(3mks)

21. Name the substances produced as a result of anaerobic respiration in:-
(i) Yeast (1mk)
(ii) Human muscles
(1mk)

22. The figure below shows a biological reaction between an enzyme molecule and a substrate molecule.



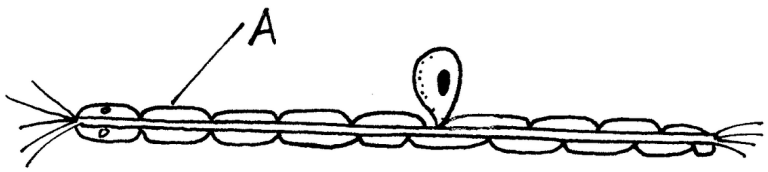
(i) State the properties of enzyme shown above.
(2mks)

23. Apart from magnifying objects state the other functions of a microscope.
(1mk)

24. State three features that places a spider in class arachnida and not insecta. (3mks)

25. State the importance of diffusion in organisms.
(2mks)

26. The diagram below represent a neuron



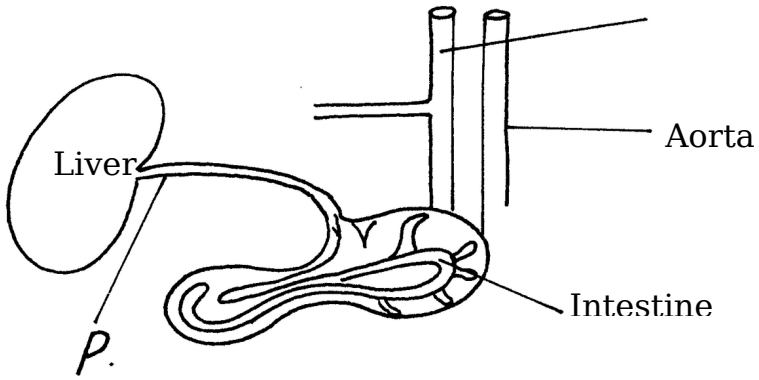
a) Identify the type of neuron illustrated (1mk)

b) Name the part labeled A and state its functions.

27. State two advantages of fossil records of evidence of evolution (2mks)

28. Distinguish between protogyny and protandry. (2mks)

29. The figure below shows liver, intestine and related blood vessels in the human body.



a) Name the blood vessel labeled P.
(1mk)

b) Name two substances that are transported by blood vessel P.
(2mks)

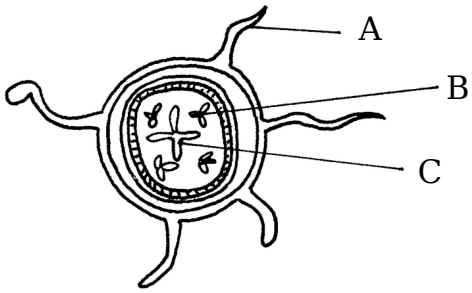
30. State the role of sunlight in the process of photosynthesis.
(1mk)

31. Name (i) one enzyme that occur in the mammalian red blood cells (RBC)
(1mk)

(ii) State the role of the enzyme named in (i) above.
(1mk)

32. How is aerenchyma tissue adapted to its functions in hydrophyte plants.
(1mk)

33. The diagram below shows the transverse section of a young dicotyledonous root.



(i) Mention the parts labeled (3mks*)*

A

B

C

(ii) Mention the function of the structure labeled B.

(1mk)

34. State the function of the following structure of the human brain. (3mks)

(i) Cerebrum

(ii) Cerebellum

(iii) Medulla oblongata

35. (i) State the scientific skills that would be needed in carrying out an experiment on translocation of food in a plant from the leaves to the rest of the plant.(3mks)

(ii) What biological tool would be useful to an entomologist when collecting small crawling animals

(1mk)

MARKING SCHEME

231/ 1

BIOLOGY

1. Genetics – (1mk)

2. i) Catalase enzyme (1mk)

ii) To breakdown hydrogen peroxide (H_2O_2) produced during cellular metabolism (1mk)

3. – Drooping leaves, exposes less surface area hence reduces rate of transpiration ,

hence conserve water

(1mk)

4. – Stomata

- Lenticels

- Cuticle – (3mks

5. – Exposes the leaves in position to maximize light absorption thereby enhancing photosynthesis

(1mk)

6. – Special creation

- Organic evolution

(2mks)

7. a) P – spores

Q- Sporangium

b) fungi

9 i) Ribs are pulled upwards & outwards – volume of thoracic cavity increases and pressure decreases

(1mk)

ii) Diaphragm flattens by the contraction of its muscles

(1mk)

A- Incissors (1mk)

C- Pre – molar (1mk) (1 x 1)

11. Large surface area, thin, moist highly vasculourised

(2mks) (1x 2)

12. - Perceive sound

- Thermoregulation in elephants

- Maintain balance (1 x 2) – (2mks)

13 a) i) – Mitochondria

ii) - Chloroplasts

b) - Sap vacuole

(1mk)

14. a) Visking tube is semi – permeable and allows passage of small glucose molecule into the

boiling tube

(1mk)

b) i) Volume decreased

(1mk)

ii) Volume increased

(1mk)

15. Clearing bushes around residential areas

- Sleeping under treated mosquito nets (1 x 2) – 2mks

16. - Lubrication

- Absorbs shock (2mks) (1x 1) mks

17. a) - Immature embryo

- Impermeable seed coat / testa

- Growth inhibitors

- Absence of hormones / enzymes 3 mks

b) - Survival against harsh environmental conditions

(1mk)

18. a) Glucagon (1mk)

b) ADH (Anti- diuretic hormone)

(1mk)

19. a) Root tip, shoot tip cambium

(1mk)

b) i) metaphase (1mk)

ii) Chromosome arranged at the equator

(1mk)

20. - Is the selection of organisms within a population with variations that offers

them some reproductive advantages over others

(2mks)

21. - Carbon sugar molecule

- phosphate molecule

- Organic bases (1 x 3) 3mks

22. i) Ethanol / Alcohol + CO_2 + Energy / ATP

(1mk

ii) - Lactic acid + Energy (1mk)

23. i) Specificity

ii) Not destroyed or altered during reaction (1 x 2) 2mks

24. Resolution (seeing two objects which are very close together of separate objects)

25. - Has two body parts
- Has lung books for gaseous exchange
- Lack antennae
- Have four pairs of legs (1 x 3) 3mks

26. - Feeding in insectivourous plants
- Absorption of digested food
- Gaseous exchange in plants & animals
- Excretion of waste products (1 x 3) 3 mks

27. a) Sensory neurone

b) Myelin sheath

c) Increases speed of impulse transmission

28. - Gives evidence of types of organisms that lived long time ago in certain geological age

- Gives evidence of morphological / structural changes that have taken place over a long time

29. - Protogyny – Female part, / pistil / stigma of a flower mature before the male

- Protandry – Male parts / stamen mature earlier than the female parts – stigma / pistil

30. a) Hepartic portal vein (1mk)

b) - Amino acids
- Glucose (1 x 2) 2 mks

31. To split water molecule into oxygen and hydrogen atoms (1mk)

32. i) Carbonic anhydrase (1mk)

ii) Responsible for breaking down sodium bicarbonate

33. - Has large air spaces which store gases for gaseous, exchange / buoying
(1x 2) 2mks

34. i) A – Root hair
B- Phloem (1 x2) 2mks
ii) Transport of water and minerals (1 x 1) 1mk

35. i) Intergrate senses such as vision hearing and taste
(1mk)
ii) Maintenance of body balance and posture
(1mk)
iii) - Control breathing / vomiting / swallowing involuntary movement
(1mk)

36. i) - Observation
- Recording
- Evaluation (1 x 3) 3mks)
ii) Pour of forceps (1 x 1) 1 mk

SAMPLE 2

231/1

Paper 1

1. Give any two benefits of transport in plants.
1mk

2. Name the locomotory structure of most members of Monera kingdom.
1mk

3. (i) Define the term homologous structure.
1mk

(ii) What is natural selection? 1mk

4. State any two scientific skills that one develops while studying biology.
1mk

5. Differentiate between Homo erectus and Homo Sapiens.
3mks

6. (i) State the function of root hairs in plants. 1mk

(ii) Explain why the cell walls of root hairs are thin.
1mk

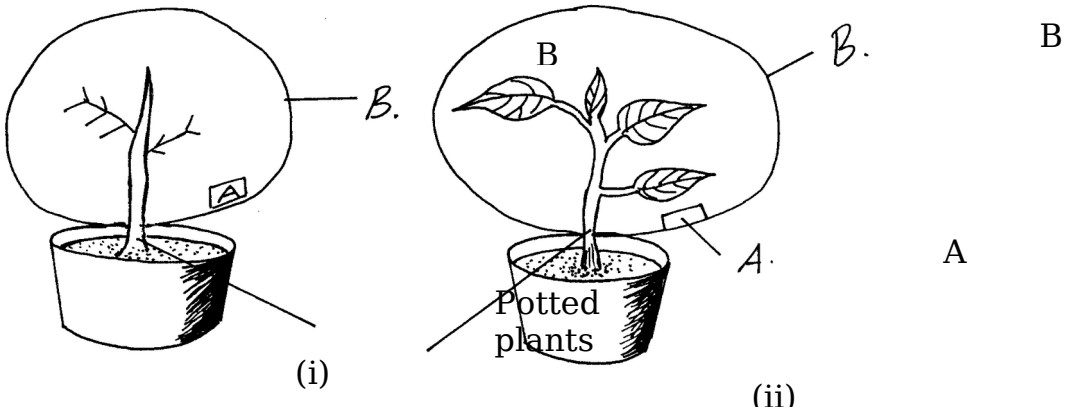
(iii) List two benefits of transpiration in plants.
2mks

7. State the two functions of the cell organelle that contains chlorophyll in plants. 2mk

8. (i) List any two properties of enzymes
1mk

(ii) Put down any two components of gastric juice.
1mk

9. The set up below is used to show that water is given off by leaves during transpiration.



(i) Name the materials B and A.
2mks

(ii) Why was sety-up (i) included in this experiment? 1mk

(iii) Give a reason why the pots were covered with material B.
1mk

10. (i) Distinguish between osmosis and active transport.
2mks

(ii) Explain what happens to a plant cell when it is placed in hypotonic solution. 1mk

11. Give the functions of the following parts of the heart.

(i) Pericardium. 1mk

(ii) Coronary vein 1mk

12. (i) Name the two main antigens that determine human blood groups. 1mk

(ii) State the symptoms of haemolytic disease of the new-born 1mk

13. (i) Give any two functions of human skin. 1mk

(ii) List any two adaptations of the liver to its functions. 2mks

14. (a) Define the terms

(i) Population. 1mk

(ii) Biomass 1mk

(b) Why do herbivores have large eyes on the side of their heads? 1mk

15. (i) State the function of cervix in female mammals. 1mk

(ii) List any two preventive measures you would take to control hepatitis B. 2mks

16. (i) Give any two views held by the theory of organic evolution on the origin and nature of life. 2mks

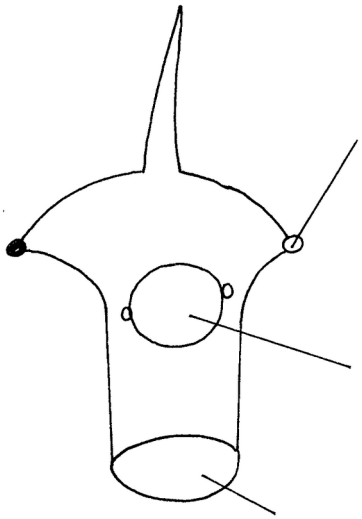
17. (i) Distinguish between tropisms and taxes. 2mks

(ii) Name the homeostatic functions carried by hypothalamus. 1mk

18. (i) State any two supporting tissues which provide mechanical support in pants. 1mk

(ii) Give any two functions of exoskeletons. 1mk

19. (i) The diagram below shows a vertebra. Identify the parts labeled L and M. 1mk



(ii) Mention two tabular visceral organs where smooth muscles are found.

1mk

(iii) Write down any two functions of paired fins in tilapia fish.

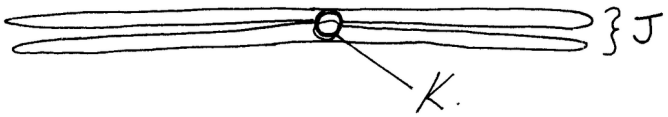
1mk

20. Differentiate continuous variations from discontinuous variations.

2mks

21. The figure below shows the structure of a chromosome. Identify the parts labeled K and J.

1mk



22. (i) State the role of decomposers in an ecosystem.

1mk

(ii) Give any four symptoms of amoebiasis.

2mks

23. (i) Why do guard cells lie in close contact with epidermal cells?

1mk

(ii) Give a reason why mammalian lungs are enclosed in an air-tight pleural membrane.

1mk

24.(i) State one adaptation of canine teeth to their functions.

1mk

(ii) List any two functions of water in man.

2mks

25. Explain what happens in man when paying back oxygen debt.

1mk

26. a) mention the components of nervous system in mammals.

1mk

b) Write down any two observable characteristics of members of class Dicotyledonae.

2mks

27. (a) What are the benefits of mitosis.

2mks

b) State any two advantages of seed dormancy in the life of a plant.

2mks

28. (a) Define the term backcross as used in genetics.

1mk

(b) (i) Name the chromosomes on which the gene that leads to hairy nose is located. 1mk

(ii) Define disjunction type of chromosomal mutation.

1mk

29. (i) What do you understand by the maxim cell specialization?

1mk

(ii) Give the function of body tube in a light microscope.

1mk

30. What is the role of adrenaline hormone? 1mk

31. State the two main roles of Lamarks Theory of evolution.

2mks

32. Explain briefly the necessity of excretion in animals.

2mks

33. What are the symptoms of asthma?

2mks

34. State three advantages of fossil records.

3mks

MARKING SCHEME

231/1

PAPER 1

1. - Absorption of water and dissolved mineral salts
   - To translocate food nutrients from leaves to other parts of the plants
   - To remove excess water through leaves
   - To transport O_2/ CO_2 to from respiring cells

2. - Flagella

3. i) These are structures with common origin but have been modified to perform different functions e.g. fore limbs in mammals and birds

   ii) It is the concept that nature selects organisms best fitted for a particular environment and that those that are less fitted are weeded out. The selected organisms breed and propagate their own kind while the ones selected against perish and leave no offspring

4. Planning, observing, recording, classifying, measuring, analyzing and evaluation

5.

Homo erectus	Homo sapiens
- Low brain capacity, 880cm^3 - Less culture development - Small canines - Prominent brow ridge - Rudimentary language	- High brain capacity 1400cm^3 - Highly developed culture - Small canines and wisdom teeth - Reduced brow ridge/ flat face - Speech vocalization

6. i) To absorb water and dissolved mineral nutrients/ salts

ii) To reduce the distance across which water and mineral salts move during absorption

iii)
- Cooling of plants
- Distribution of mineral salts throughout the plants
- Absorption of water from the soil is maintained
- Wilting
- Removes excess water from plants
- Responsible for turgar pressure in plants

7.
- To store starch/ lipids
- To store chlorophyll in grana
- To trap/ capture light energy used during photosynthesis

8. i)
- Enzymes are denatured at high temperature
- Enzymes are inactive at very low temperature
- Extreme acidity/ alkalinity denatures most enzymes
- Enzymes are specific in nature

ii) Pepsinogane, rennin, HCL and mucus

9. i)
- A- Copper II sulphate/ cobalt chloride paper
  B- Polythene bag

ii)
- It is a control experiment

iii)
- So that water from the soil does not evaporate and give misleading results

10. i) Osmosis is the process by which solvent molecules move from a region of low concentration to a region of high concentration across a semi- permeable membrane, while active transport is a process by which substances are moved across a cell membrane against a concentration gradient

ii) Absorbs water by osmosis, swell/ enlarge and exert an outward pressure on the cell wall. (This pressure is called turgar pressure)

11. Pericardium- Secrets fluid which lubricates the heart
- Checks on the overdilation of the heart
- Keeps the heart in position

caranary vein- Conveys blood to the right auricle/ atrium

12. i) Antigens A and B
- Rhesus factors

ii) - Jaudice
- Anaemia
- Premature birth

13. i) - Protects underlying tissues from pathogens and ultra violet rays from sun, dessication
- Regulate temperature through sweating
- Excretion of mineral salts, excess water, urea traces e.t.c.
- Reception/ detection of stimuli, such as heat, cold, pain, touch and pressure
- Synthesis of vitamin D
- Storage of fat

ii)- Has kupfer cells which decompose old and worn out red blood cells to release haemoglobin

- Relative large in size to vary the amount of blood in the general circulation
- Has catalase enzyme to decompose hydrogen peroxide (H_2O_2)
- Connected to hepatic portal vein, artery and hepatic vein which bring in blood rich in nutrients, oxygenated blood and carries away blood rich in nutrients
- Receives hormones insulin and glycogen and adrenaline which regulate level of blood sugar

14. i) All members of a given species in a particular habitat at a particular time

ii) It is the total weight of living organisms at a particular trophic level per unit area of land

b) To give them a wider field of view that enables them to track their enemies from far and therefore take precautions

15. i) To enclose the entrance to the uterus during pregnancy
Passage to and from uterus

ii)
- Vaccinate children
- Observe high standards of hygiene
- Avoid sexual contact with infected persons
- Avoid casual agents/ organisms

16.
- Life came into existence through combination of chemicals
- Initial life forms were simple and have changed over years to form the present complex organisms
- Scientific evidences in the form of experiments, artifacts and fossils back this theory

17.

Tropisms	Taxes

- Growth responses - Slow responses - Caused by growth hormones - Permanent responses	- locomotony responses - Fast responses - Not influenced by growth hormones but by nerves - Temporary responses

ii) - Thermo regulation/ temperature regulations
- Osmo regulation/ regulations of osmotic pressure
- Control appetite

18. i) Parenchyma, Collenchyma, Scelerenchyma, Xylem vessels and Tracheids

ii) - To provide surface for muscle attachment
- To support and protect inner delicate tissues
- To prevent excess loss of water from body tissues

19. i) L- Transverse process
M- Centrum

ii) - Blood vessels
- Gut
- Urinary tract
- Reproductive tract
- Respiratory tract

iii) - Maintain balance
- Braking
- Changing direction

20. In continuous variations individuals in a species show a complete range of measurements from one extreme to another√ ; while in discontinuous

variation individual within a species show distinct/ definite differences in a given characteristic√

21. J- Chromatids

K- Centromere

22. i) To break down organic materials into simple substances which are made available for re-use by producers/ other organisms to rebuild proteins, and carbohydrates/ organic compounds

ii) - Diarrhoea
- Dehydration
- Fever
- Abdominal pain
- Severe pains when passing stools
- Blood stained stools
- Abscesses/ swelling of livers/ lungs and brain

23. i) - To be able to draw water from them

ii) - To ensure no leakage of air into the ribcage

24. i) Canine teeth are conical with sharp pointed tips for seizing and tearing flesh

ii) - To transport nutrients and other substances
- It is a medium in which enzymes work and provides solvent support for all metabolic reactions
- Cools the body with minimum loss of water since it has a high latent heat of vaporization

25. - Lactic acid is oxidized to CO_2, water and energy when oxygen is available

- Lactic acid is taken to the liver and converted into glycogen for storage

26. a) - Central Nervous System
- Peripheral Nervous System

b) - Broad leaves with network of veins
- Taproot system present

- Most of their flowers are brightly coloured and floral parts exist in 4's or 5's or their multiples
- Have two cotyledons

27. a)
- Leads to growth
- Maintains diploid/ genetic constitution of the species
- Produces cells to replace/ repair damaged tissues
- Basis of a sexual reproduction/ vegetative propagation in plants

b)
- Provides seeds with adequate time for dispersal to suitable environment
- Enable seeds to survive adverse environmental conditions
- Seed embryo has adequate time to develop until favorable conditions are available

28. a) It is a test-cross where an offspring is crossed/ mated with one of its parents

b) i) Chromosome Y

ii) It is a kind of chromosomal mutation that leads to addition/ loss of one/ more whole chromosome(s)

29. i) It is the performance of specific function by a kind of cells

ii) To hold the eye piece and the revolving nose piece

30. To increase hydrolysis/ break down of glycogen to glucose in order to raise the level of blood sugar

31.
- Tries to explain the role of environment in directing phenotypic changes
- Tries to explain the occurrences of vestigial organs

32.
- To avoid accumulation of waste products since they are toxic to cells
- They change the conditions under which cells function efficiently, leading to death

33.
- Producing wheezing sound
- Feeling of suffocation
- Panting

- Having breathing difficulties

34. - Show extinction of certain organisms
- Show gradual increase in complexity from simple organisms to complex organisms
- Show transitional forms between groups of organisms
- Show direct evidence of the type of organisms that existed during a given geological times

SAMPLE 3

231/1

Paper 1

Answer all the questions in the spaces provided.

1. What is active transport?

(2mks)

2. What is meant by the terms

(i) Hypogynous flower (1mk)

(ii) Pistillate flower

(1mk)

3. Distinguish between analogous and homologous structures.

(2mks)

4. (a) State the function of co-factors in cell metabolism.

(1mk)

(b) Give one example of a metallic co-factor.

(1mk)

5. Suggest three measures that can be taken to control infection of man by protozoan parasites.

(3mks)

6. Explain what would happen to onion epidermal cells if they were placed in distilled water.

(5mks)

7. State the characteristics that can separate the following organisms into respective classes – millipedes, Tsetse fly and spider.
(3mks)

8. Which type of a joint is found at the articulation of
a) Pelvic girdle and femur.
(1mk)
b) Humerous and ulna (1mk)

9. Name the blood vessel that transports blood from
(i) heart to the lungs.
(1mk)
(ii) Small intestine to the liver
(1mk)

10. State three ways that the tracheole system in insect is adapted for gaseous exchange.
(3mks)

11. a) State the role of light in the process of photosynthesis.
(1mk)
b) Name one of the end products of dark reaction in photosynthesis.
(1mk)

12. State the role of the following hormones in the human body.
a) Insulin (1mk)
b) Antidiuretic hormone
(1mk)

13. a) What happens to excess fatty acids and glycerol in the body?
(2mks)
b) State two functions of muscles found in the alimentary canal of mammals. (2mks)

14. a) Name the tissue that is responsible for secondary thickening in plants.
(1mk)
b) What is the role of water in a germinating seed?
(2mks)

15. a) State two functions of synovial fluid in a joint in a mammalian skeleton
(2mks)
b) Name the three types of muscles found in a mammal.
(3mks)

16. What is the function of the following cells in the retina of the human eye?

(2mks)

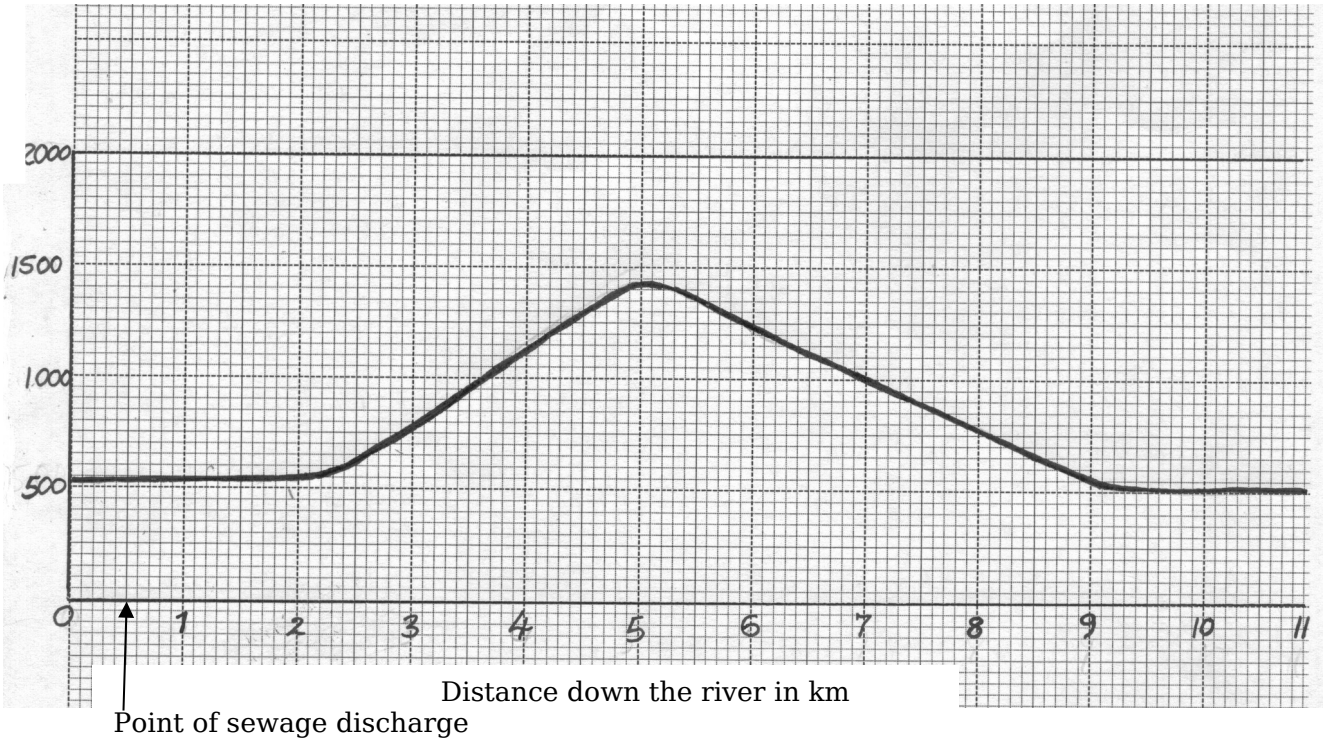
a) Cones

b) Rods

7. Name three types of chromosomal mutations.

3mks)

8. The graph below shows the effects of sewage on the population of a pecies of bacteria in a certain river.



Account for the changes in population of bacteria between 2 and 10 Kilometres down the river.

(2mks)

19. Explain how tendrils of climbing plants coil around a support

(3mks)

20. Name the spore producing structures in

a) Bryophytes. (1mk)

b) Pteridophytes (1mk)

21. a) During which phase of meiosis does crossing over occur.

(1mk)

b) How do identical and fraternal twins arise?

(4mks)

(i) Identical twins

(ii) Fraternal twins

22. a) Account for the loss in dry weight of cotyledons in a germinating bean seed. (1mk)

b) State three effects of gibberellins on shoots of plants.

(3mks)

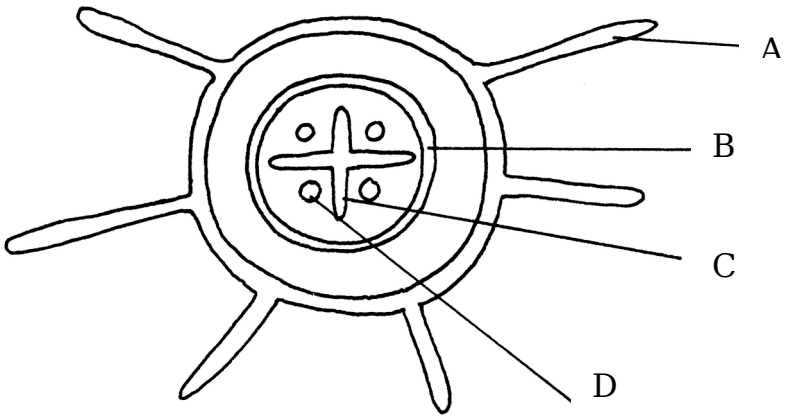
23. Which one of the cell organelles would be more numerous in;

a) An enzyme secreting cell.

(1mk)

b) A rapidly respiring cell in comparison to other cells in the same organism? (1mk)

24. The figure below represents a transverse section of a young root.



a) Identify parts labelled A and B.

(2mks)

b) State the function of the parts labelled A, C and D.

(3mks)

25. Give reasons for each of the following;

a) Constant body temperature maintained in mammals.

(3mks)

b) Low blood sugar level is harmful to the body.

(3mks)

26. State two ways by which leaves of plants are adapted to gaseous exchange. (2mks)

27. Other than Energy,, name the other products of anaerobic respiration in plants. (2mks)

MARKING SCHEME

231/1

1. Movement of molecules against concentration gradient; using energy
2. (i) Conditions where other floral parts are positioned/ arise below the ovary/superior ovary;

   (ii) female flower,
3. Analogous structure which (appear similar and) perform similar / same functions but different origins;

   Homologous - structure whch have a common origin but (have evolved) to perform different function;

4. a) substance that activate the enzymes:

   b) iron /mg/zn/cu/ca/Mn4/cobalt/molybdenum/k

   Fe^{2+} Mg^{2+} Zn^{2+} Cu^{2+} Ca^{2+} Mn Acc Correct Ionic Form;
5. Proper disposal of human waste/faeces;

   Destroy breeding sites of vectors

   Proper cooking of food /boiling of drinking water;

   Use of insecticide against vectors / drugs against pathogens

   Use of protective dwelling /mosquito nets to prevent vector bites/ proper hygiene;
6. cell sap is more conc. Than the surrounding water, water get into the cell by osmosis;

   the cell swell/become turgid; but doesn't burst due to the cell wall,

7. body parts/division
   number of limbs /legs;
   body segments
8. a) Ball and socket;
   b) Hinge
9. (i) Pulmonary artery;
   (ii) Hepatic portal vein;
10. Large surface area;
    Thin membrane
    Moist surface
11. a) To split water/photolysis;
    b) Glucose
12. a) Regulation of blood sugar/ control conversion of glucose to glycogen;
    b) control re-absorption of water in the kidneys/ nephron/ loop of ttenle /regulation of water in the body osmotic pressure of the blood;
13. a) converted to fat; and stored; (beneath the skin, or around body organs)
    b) peristalsis
    Acts as a valve;
14. a) Secondary cambium /cork cambium/ vascular cambium;
    b) soften stored food for breakdown; soft seed coat;
       Transport dissolved substances;
       Medium of enzymes action;
15. a) Reduction of friction/lubrication; absorption of shock / distribution of pressure (at joint);
    b) Smooth muscle /visceral muscles;
       Skeletal/ striated muscles;
       Cardiac muscles;
16. a) Discrimination of colour/details/accurate vision/colour perception/ sensitive to light of high intensity
    b. Sensitive to light of low intensity/ dim light vision;
17. Inversion; duplication; deletion; translocation; non-disjunction
18. 2-5 km population increase – because sewage provide nutrients
    5-10 km population decrease because of depletion of nutrients; in sewage/ decomposition of sewage is complete;

19. in coming into contact with the support Auxin concentration reduce on the side experiencing touch stimulus; reducing growth rate; making the plant bend round the support;

20. a) Capsule;

b)Sori/ sorus;

21. a) Prophase I

b) (i) An ovum is fertilized; and later cells separate in the early cell division;

(ii) Two ova are released; and fertilized by two different sperms;

22. a) stored food is used up/broken down by enzymes to provide nutrients for germinating embryo

b) Promotes cell division/cell elongation; parthenocapy.

Formation of side branches of stems;

Affect leaf expansion and shape /retard leaf abscission

23. a) Rough/ smooth – endoplasmic/ golgi bodies/ ribosome's/ lysosomes

b) mitochondria/ mitochondrion;

24. a) A - Root hair;

B - endodermis

b) A- Absorption of water;

C- Transport water, transport mineral salt;

D- transport manufactured food;

25. a) Most enzymes in the body function within a narrow range of temperature;

High temperature denature enzymes

Low temperature. Inactivate enzymes inhibits enzymes;

b) Sugar is a raw material for respiration; therefore less sugar leads to low rate of respiration; hence less energy available to the body / low rate of metabolism;

26. Broad/flat lamina; to provide large surface area for absorption of gases; Thinness to allow gases to pass through a short distance; presence of stomata to ensure efficient diffusion of gases presence of air spaces for gases to diffuse easily/

27. carbon iv oxide;

ethanol / alcohol;

SAMPLE 4

231/1

Answer all questions in the spaces provided

1. In a family, all off springs have blood group AB. What are the possible blood groups of

   the parents? 1mk

2. What type of cell division occurs in gamete cells. 1mk

3. State <u>two</u> functions of gibberellins. 2mks

4. What characteristics of Arthropoda makes them most successful of invertebrates. Explain.
   2mks

5. The viability of seeds is a necessary internal condition for germination. State <u>two</u> factors

   that may lead to loss of viability 2mks

6. Give a reason for each of the following:-

   a) a mature plant does not lose its shape even after losing water.
   1mk

   b) Xylem vessels do not collapse even when they do not contain water.
   1mk

7. (i) Name the products of the dark reaction in photosynthesis. 1mk

   (ii) Why do plants in low altitude grow faster than plants in high altitude.
   2mks

8. In what two ways is self-pollination not possible in some plants.
   2mks

9. Name the diseases caused by deficiency of:-

   a) Phosphorus 1mk

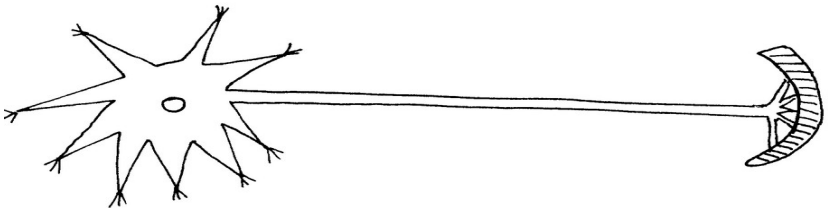
b) Vitamin B_2 1mk

c) Protein 1mk

10. State three processes that maintain the movement of water in plants from roots to the leaves.

3mks

11. The diagram below shows a specialized cell.



a) Identify the cell 1mk

b) State any two structural adaptations of the cell shown in the diagram above that

accelerate the rate of nerve impulse transmission.

2mks

12. Give an example of incomplete dominance in animals. 1mk

13. a) A man has non-pigmented skin, pink eye-iris , very poor eye sight and very light white hair. Name the type of hereditary disorder the man has. 1mk

b) The man in 16(a) above marries a woman carrier of the trait for disorder. What's the probability of their children inheriting the trait.

1mk

14.



The figure above shows a half jaw of an animal, use it to answer the questions that follow.

a) State the number of teeth found in the lower jaw. 1mk

b) (i) State the mode of feeding 1mk

(ii) Give a reason for your answer in b(i) above 1mk

c) State one function of enamel in mammalian tooth. 1mk

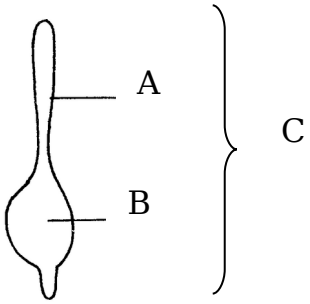
15. a) When the pancreatic duct is blocked in a mammal blood sugar regulation remain the same. Explain.

2mks

b) Differentiate between assimilation and egestion as used in animal digestion.2mks

16. The figure below shows a part of female reproductive structure of a plant. Label the marked parts.

3mks



17. The table below shows the estimated number of organisms in a lake.

Type of organisms	**Weight in gram**
Mosquito larvae	800g
Aquatic plants	5000g
Bacteria	40g
Fishes	1200g

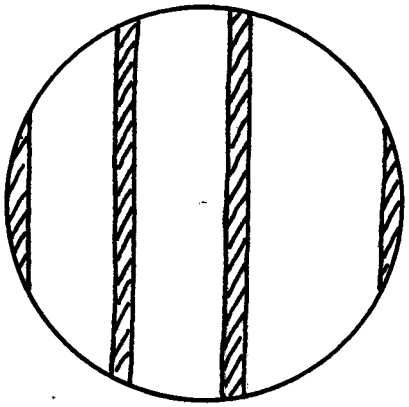
Use the table to answer the questions below

a) Construct a possible food chain. 1mk

b) Construct a pyramid of Biomass for the given data.

2mks

18. A form one student, trying to estimate the size of onion cells observed the following on microscope's field of view

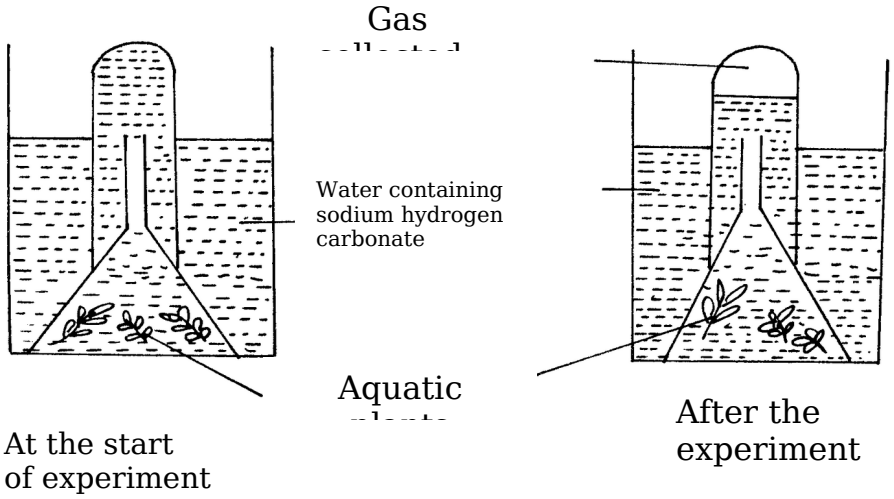


He counted 20 cells across the field of view. Calculate the size of one cell in micrometres. 2mks

b) State the function of a diaphragm in a microscope. 1mk

19. In what ways is a spermatozoan adapted to its function?
2mks

20.



The set up above shows an experiment to investigate photosynthesis.

a) What gas was collected in the test tube? 1mk

b) What two environmental conditions are necessary for the experiment . 2mks

c) What was the role of sodium hydrogen carbonate in the experiment? 1mk

21. a) State two common features possessed by perennating organs that adapt them to

their functions. 2mks

b) State the uses of the following plant products.

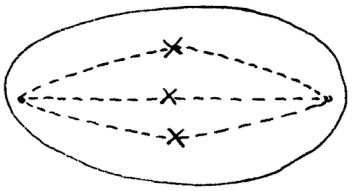
2mks

(i) Tannins **NDI**

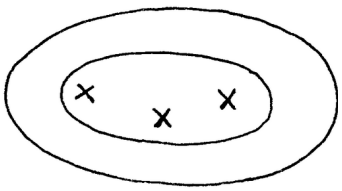
(ii) Papain**NDI**

22. The diagrams below shows stages in mitotic cell division.

A



B



(i) Name the stages A and B.

2mks

(ii) What is the significance of mitosis in living organisms

2mks

23. How are mesophyll parenchyma cells suited to performing their functions.

2mks

24. What are the functions of the following hormones in human menstrual cycle.

a) Follicle stimulating hormone (FSH) 1mk

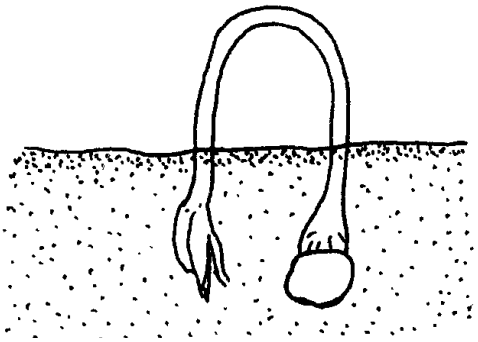
b) LH (Luteinising hormone) 1mk

25. a) What is seed dormancy. 1mk

b) State two factors that cause seed dormancy.

2mks

c)



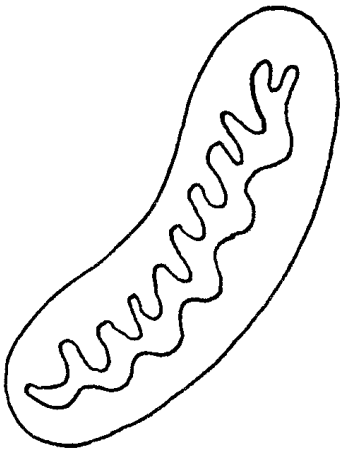
What type of seed germination is represented in the diagram above.
1mk

26. a) Define geotropism.
2mks

b) Which parts of a plant are positively geotropic?
1mk

27. Explain how plant roots take up oxygen and eliminate carbon (IV) oxide into the soil 2mks

28.



a) Name the organelle shown in the diagram above.
1mk

b) State functions of the following cell structures.

(i) Vacuoles 1mk

(ii) Nucleolus 1mk

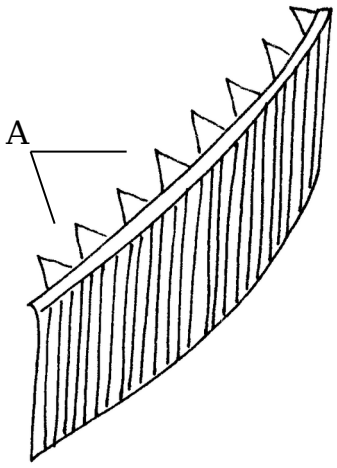
29. a) What is meant by vestigial structures. 1mk

b) Name two vestigial structures present in man.

2mks

30. What's active transport? 1mk

31. The diagram below shows a gill obtained from fish. Study it and answer the questions below it



a) Label A 1mk

b) What is the function of gills to fish? 1mk

MARKING SCHEME

231/1

BIOLOGY (THEORY)

1. AA and BB ; 1 mk

2. Meiosis, 1 mk

3. Promotes cell division/ elongation in dwarf plants; parthenocarpy/ setting of fruits; formation of side branches; activates hydrolytic enzymes during germination/ break seed dormancy ;

inhibit growth of adventitious roots; promote leaf expansion ;retards leaf abscission; (any 2 mks)

4. - Jointed appendages adapted for various functions
   - Hardened exoskeleton made of chitin to protect from desiccation and predation

5. Seed stored for long lose viability due to depletion of food reserves;
   - Destruction of embryo by pests and diseases;
   (2mks)

6. a) Cell wall is rigid (hence provides support)
   b) Xylem has lignin for support
   1 mk

7 i) Simple sugars e.g. glucose, fatty acids and amino acids
   1 mk
   ii) Higher temp,in low altitude
   Higher carbon IV oxide concentration in low
   2 mks;

8. Self Sterility; Heretostyly: protandry; photosyny; dioeciou plants any
   2 mks

9 Rickets
   Pellagra
   Kwashiokor;

10. Transpiration stream; cohesion/ Adhesion; root pressure

11. a) nerve cell/ motor neurons;

b) Nodes of Ranvier allow impulse leaping

Myelin sheathed axon allow impulse to flow faster in sheath rather than in axon; 2 mks

12. a) ABO blood group

A crisis between a short horned cattle and white coat – Roan;

1mks

13. a) Albinism; Acc. Albino

b) ¼ ;

14 a) 20; 1 mk

b) Herbivorous 1 mk

15 a) Pancreas secrete insulin glucogen directly into the blood stream;

b) Incorporation of absorbed products of digestion into cell metabolism;

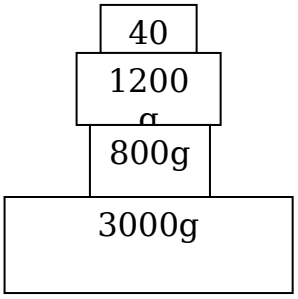
elimination of undigested food and indigestible food;

16. A – style; B - ovary C. Carpel; 3 mks

17 a) Aquatic plants - mosquito larvea – fish - Bacteria

1mk

b)



Bacteria

Fishes

Mosquito larvae

Aquatic plants

Correct order:

Proportionality

18. a) Size of cell = Diameter of field of view;

No. of cells

= 3000 NM = 150 μm;

20 rej. wrong unit

2mks

b) Allow passage of light; 1 mk

19 (i) Has a tail for swimming towards the ovum

(ii) Its head has a crosome that releases lytic enzyme to dissolve ovum membrane. Into the nucleus

(iii) Has numerous mitochondra to produce more energy

c) Provide a surface for the attachment of muscles that move the arm

20 a) Oxygen;

b) Light;

Carbon iv oxide;

c) Dissociates in water to give out Co_2; necessary for photosynthesis

21. a) Presence of scale leaves auxiliary buds; stored food; any 2 mark

b) Tanin: Treatment of leather;

Papin, Contain a proteolytic substance used in food industry such as meat tenderizers;any 2 mks

22 A. Metaphase;

B. Prophase

- Basis of asexual reproduction e.g. in Amoeba
- Take place during the growth of organism
- Mitosis ensures that the chromosome constitution/genetic constitution of offspring is the same as parent

23. Large intercellular spaces which are in communication with surrounding through the stomata

The cells are thin and moist making them efficient for gaseous exchange;

24 FSH stimulate eostrogen release to linger development of Graafian follicle it to burst open &

release ovum.

- Cause ovulation; 2 mks

25. a) Period of rest in seeds after ripening

b) Epigeal;

c) Undeveloped embryo presence of chemical inhibitors e.g. abscise acid; low concentration

of hormones, hard impermeable seed coat, environment e.g. freezing during winters; any

26. a) Response in plants; toward pull of gravity;

b) Roots

27. Gaseous exchange in roots is done by diffusion; through large surface area of root hair;

28. a) Mitochondrion

b) Sap vacuoles store sugar and salts therefore contribute properties of the cell;

- food vacuole store and digest food;
- Contractile vacuoles excrete unwanted materials from cell any to 2 mks

29 Those structures that have in course of time ceased to be functional and reduce into rudimentary or

n size; 1 mk

b) Appendix,

A vestigial tail

30 Movement of substances against concentration gradient/from low concentration to high concentration

31. Gill rakers; 1 mk

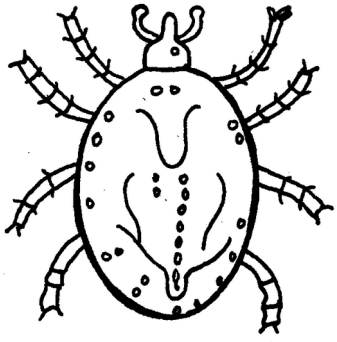
Gaseous exchange; 1mk

SAMPLE PAPER 5

231/1

BIOLOGY

1. State two functions of the mammalian ear.
   (2mks)
2. State two factors, which determine energy requirements in humans.
   (2mks)
3. The figure below represents an organism



(a) Name the phylum and class to which it belongs.

(2mks)

Phylum

Class

(b) State two observable features that are used to place.the organism in the class in (a) above.

(2mks)

4. Give **two** functions of calcium in the human body.

(2mks)

5. Suggest a method that can be used to estimate fish population in a pond.

(1mk)

(b) State **two** adaptive feature in a fish that prevent it from predation by birds.(2mks).

6. List **three** evidences of organic evolution.

(5mks)

7. State function of the following materials found at the joints.

(a) Synovial Fluids (1mk)

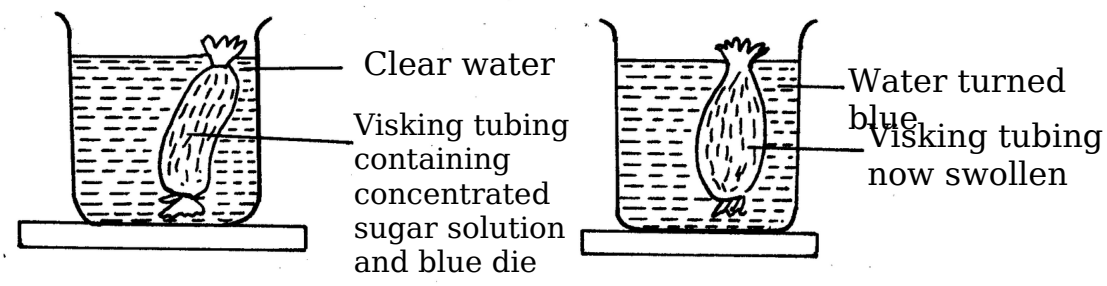
(b) Cartilage (1mk)

8. State one significant advantage that homoithermic animals have over poikilothermic animals.

(1mk)

9. An experiment was set up using visking tubing, which was filled with concentrated sugar solution. The free ends were tightly tied to prevent leakage. It was immersed in a beaker containing distilled water. After six hours the observations were made.

Start of experiment **After 6 hours**



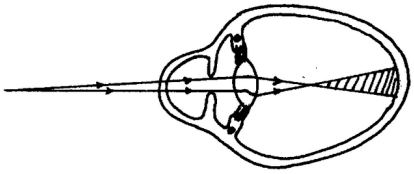
(a) Why did the visking tubing become swollen as shown in after 6 hours.

(1mk)

(b) By what physiological process did the water in the beaker turn blue? (1mk)

10. Give the theory advanced by Charles Darwin to explain the origin of species.(1mk)

11. The illustration below shows a human eye that is defective.



(a) Identify the eye defect. (1mk)

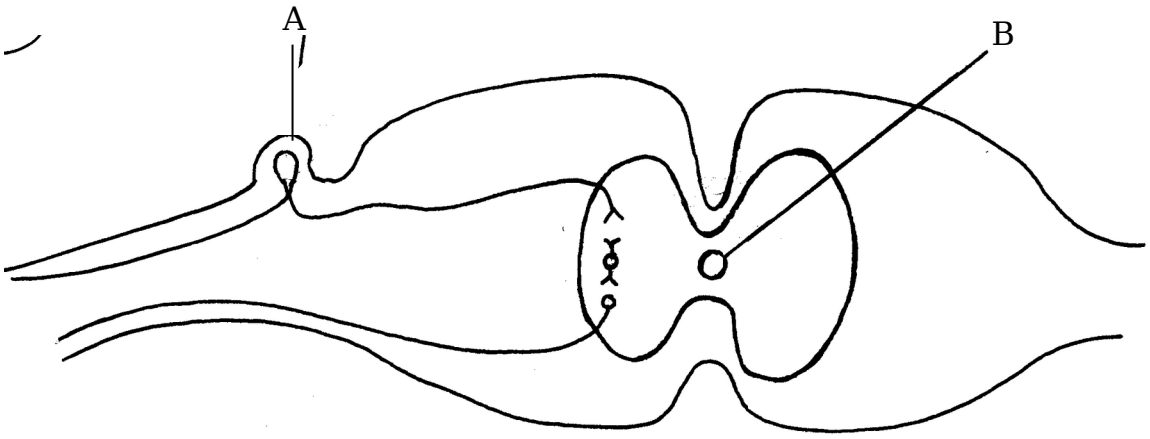
(b) How would this defect be corrected? (1mk)

12. State three functions of the endoskeleton (3mks)

13. What is a test cross? (1mk)

14. (a) Name the part of the brain that controls thermoregulation in humans. (1mk)

(b) Below is a cross section of the human spiral cord.



(i) State the function of the parts labelled A and B. (2mks)

(ii) State two functions of a spinal cord. (2mks)

15. An animal has the following dental formula,

I = $^{0}/_{2}$, C = $^{0}/_{2}$, PM = $^{3}/_{3}$ M = $^{2}/_{3}$

(a) Suggest the type of diet for this animal. (1mk)

(b) Give a reason for your answer in (a) above. (1mk)

(c) How many teeth does the animal have in total?

(1mk)

16. State the importance of the hydrochloric acid that is secreted in the stomach.(1mk)

17. Blowfly maggots (larvae) quickly burrow into decaying faecal matter as soon as they are exposed to light.

(a) Name the type of response exhibited by the maggots.

(1mk).

(b) Of what value is such a response? (1mk)

18. Define the following terms. (3mks)

(a) Biomass

(b) Ecosystem.

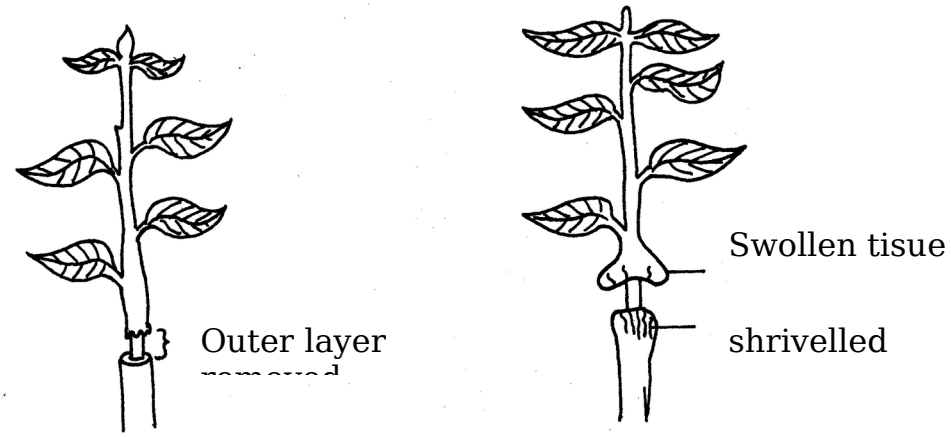
(c)Carrying Capacity

19. State two adaptation of red blood cells which make them efficient in their functions.

(2mks)

20. The figures below show an experiment that was carried out by form two students of Tengecha High School.

A Day 1 of experiment **B 30 days after setting the experiment.**



(a) What was the aim of this experiment? (1mk)

(b) Explain the observations on the stem after 30 days.

(1mk)

(c) Suggest what may happen to the plant after a long time.

(2mks)

21. List the changes that take place during inhalation in the breathing cycle of a mammal in the following:

(4mks)

(a) Rib cage thoracic cavity

(b) Diaphragm

(c) External intercostals muscles

(d) Internal intercostals muscles

22. Distinguish between (i) continuous and discontinuous variation

(1mk)

Continuous	discontinuous

(ii) Complete and incomplete metamorphosis. (1mk)

Complete	incomplete

(b) The following organisms were found in a certain habitat Water snail, protozoa, Kingfisher, mosquito larvae, phytoplankton, fish and waterweeds.

In the table below place the organisms in their respective trophic levels.

(3mks)

Trophic level	**Organisms**
Producers	
Primary consumers	
Secondary consumers	

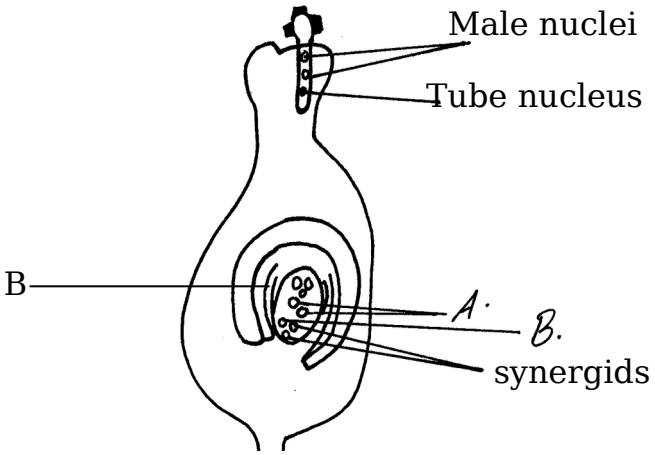
23. State two processes used by plants for excretion.

(2mks)

24. State two internal factors in seeds that cause dormancy.

(2mks)

25. The figure below shows some stage of development in the life of a plant.



(a) State the fate of A and B after fertilization.
(2mks)

(b) What name is given to this type of fertilization?
(1mk)

26. a) Name two end products of light of photosynthesis (2mks)

b) State two aspects of light that may affect the process of stage of photosynthesis.
(2mks)

27. State three homeostatic functions of the liver. (3mks)

28. Below are some parts of a male reproductive system; state how they are adapted to their functions.
(3mks)

(i) Testis

(ii) Vas deferens

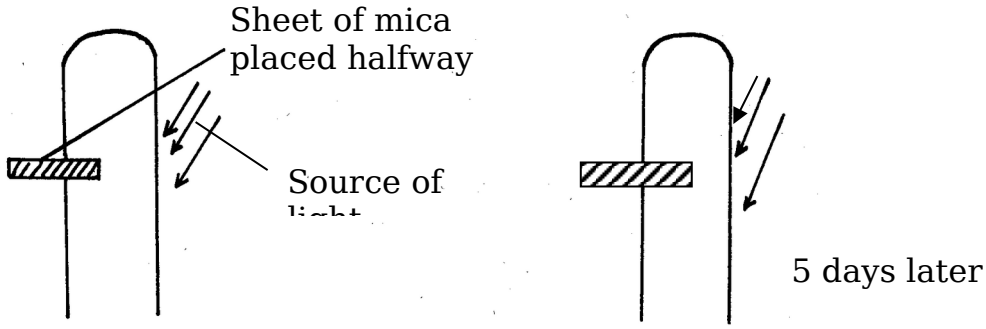
(iii) Epididymis

29. State two ways through which herbaceous plants achieve support.
(2mks)

30. Name the excretory organs in the following organisms.
(2mks)

Organism	Tissue / organ used.
Birds	
Insects	

31. The experiment below was carried out by form four students. The result was recorded below:



Explain why the shoot doesn't bend towards the light.
(2mks)

MARKING SCHEME
SAMPLE PAPER 5
231/1
BIOLOGY

1 a) Hearing;

b) Balance;

2 a) Age; Body size; Basal metabolic rate;

b) Sex; Level of work or activity;

3 a) Phylum Animalia;
Class Arachnida

b) Reasons

-Body divided into two parts- Cepharothorax and abdomen;

-4 pairs of legs/ 8 legs;

4. -For bone development;

-For strong teeth;

-Muscle constraction;

-Blood clotting;

5 a) Capture recapture method -accept capture release method

b) Silvery color-good color coumoflage;

Slippery-due to mucus so not easily trapped

6. Comparative embryology;

Comparative Anatomy;

Fossil records;

Geographical distribution

Or cell biology / cerollogy ;

Accept Taxonomy

7 a) Synerical fluid-Reduced friction;

b) Cartilage-Absorbs shock;

8 Due to maintenance of constant temperature, homothermic animals can be active throughout the day/ can occupy any region in the world;

9. a) Osmosis/ Water moved from low conc. (beaker) to the high conc. (visking tubing);

b) Diffusion;

10. Natural selection

11. a) Short sightedness (myopia)

b) Concave (diverging) lens

12. Supports organism; facilitates movement; protects delicate organs; holds organs in place; storage of ions e.g. phosphates; production of cells;

13. A cross carried out to determine unknown genotype using (homozygous) recessive individual;

Rej. Cross between offspring and parent.

14. a) hypothalamus

b) i) Dorsal ganglia-contains the cell body (centron) of the sensory neuron;

Contains cerebral spinal fluid; that nourishes the spinal cord

ii) -brings about reflex actions;

-Relays impulses to and from the brain (bringing about voluntary and involuntary actions)

15. a) Vegetation/ green plants Rej. herbivore/ herbivorous

b) Absence of upper incisors and upper and lower canines

Presence of premolars/ molars for chewing;

16. Kills micro-organisms/ bacteria/ provides PH media for enzymes to work on/ neutralizes alkali from mouth;

17. a) Photo taxes/ negative photo taxes

b) Escape from predators;

-Avoids dessiccation/ loss of water from the soft body

18. a) Biomass: Total dry weight of organisms at a particular trophic level (per unit area);

b) Ecosystem: A natural unit made up of biotic and abiotic factors interacting with each other bringing about self sustenance of the system;

c) Carrying capacity: Maximum number of organisms a particular area can comfortably support, without depleting its resources;

19. -Biconcave in shape to increase surface area for packing of haemoglobin

-Has haemoglobin with high affinity of O_2;

-A nucleated/ absence of nucleus creates more room for the for the packing of haemoglobin;

20. a) To show that manufactured food from the leaves is tran located through the phloem

b) Removal of the bark entails removing the phloem there in so manufactured foods couldn't cross over to the lower side so accumulated above the ring;

c) The tree dries; due to absence of food in the roots so no physiological process take place there/ no absorption of food and mineral salts to other parts of the plant;

21. a) Ribcage; thoracic cavity: Moves upwards and outwards

b) Diaphragm- Flattens (due to contraction of muscles);

c) External intercostals muscles-contract;

d) Internal intercostals muscles-relax;

22. i)

Continuous	**Discontinuous**
Extreme range of difference with intermediate where genes are influenced by environment;	Extreme range of difference caused by genes without influence of environment

Complete	
Process of development through all stages of life cycle;	Process of development that doesn't pass through all stages of life cycle;

b) Producers-Water weed/ phytoplankton; the two must be present to get a work
Primary consumers-Fish/ mosquito larvae/ water snail protozoa; 3 must be present
Secondary consumers-King fisher;

23. Diffusion; Transpiration; Cuttation; exudation; Depositing

24. - Immature embryo/ underdeveloped embryo; rej. undeveloped embryo; pre mature embryo
accept embryo not fully developed
- Presence of chemical inhibitor in the seed. Accept presence of abscisic acid
- Absence/ low concentrations of growth hormones;. Accept absence of gibberellins
- Impermeable seed coat/ testa;

25 a) A-Forms the endosperm/ tripoid nuclei;
B-Forms the embryo;

b) Double fertilization;

26 a) Oxygen, ATP, H^+/ hydrogen ions

b) Duration; intensity; wavelength color/ quality

27. - Regulation of sugar/ glucose;
- Regulation of lipids;

- Regulation of temperature;
- Regulation of plasma proteins;
- Regulation of excretory functions;

28. - Testis: Contains numerous somniferous tubules (on whose walls spermatogenesis occur) to
increase surface area for spermatogenesis;
- Vas deferens: Muscular and upon contraction of its muscles it pushes sperms out and allows ejaculation;

- Epididymis: Long and coiled to provide large surface area for temporary storage of sperms;

29. - Use of turgidity/ turgor pressure;
- Tissue distribution in the stems; / (sclerenchyma, parenchyma, Chouenchyma are used)
- Use of tendrils and climbing stems
- Use of spines and thorns; e.g. roses
- Use of xylem; (Thickened traicheids and vessels)

30. Birds -lungs/ kidneys/ liver.
Insects -nephridia

30. The auxins on the lit side are destroyed by light; the auixins on the dark side cannot diffuse downwards due to the blade; so no growth experienced

SAMPLE PAPER 6

BIOLOGY

THEORY

Paper 1

1. In which two ways are the organelles chloroplast and mitochondria similar. 2mks

2. How does the process of respiration depend on photosynthesis? 2mks

3. State the importance of each of the following features in animals. 3mks

   a) Solid food being broken into small pieces.

   b) Presence of caecum in herbivores mammals.

   c) Long ileum in man.

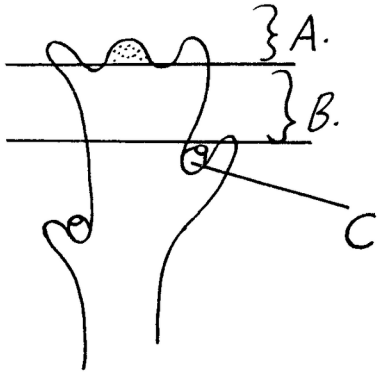
4. The paddles of whales and fins of fish adapt these organisms to their aquatic habitats.

   (i) Name the evolutionary process that may have given rise to the similar structures1mk

   (ii) What name is given to such structure?

5 a) Give a reason why most monocotyledonous plants like maize lack secondary growth. 1mk

   b) The diagram below shows a section of the stem apex.



Identify the parts labeled A,B and C.

2mks

6. a) Name the site of production of testosterone hormone in a mammalian male body.1mk

b) Explain why pregnancy in humans can be terminated when the ovary is removed before the end of four months but will not be terminated when removed after four months.3mks

7. List THREE sources of errors when using capture recapture method of estimating the population of animal in a forest ecosystem..

3mks

8. Explain the importance of keeping bees in an orchard.

2mks

9. Explain how each of the following causes variation.

(i) Meiosis 1mk

(ii) Fertilisation 1mk

10. Other than having many features in common, state the other TWO characteristics of a species.

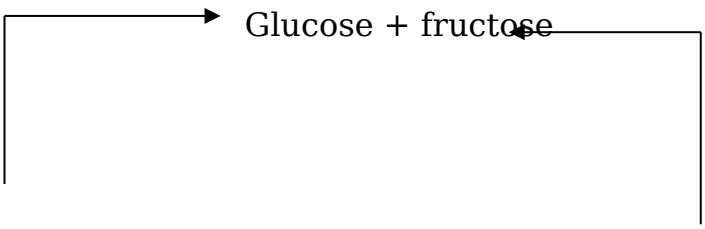
2mks

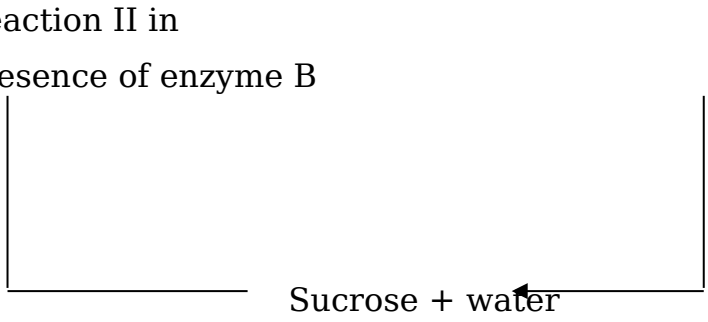
11. State THREE roles of osmosis in plants.

2mks

12. The diagram below shows chemical reactions I and II which are controlled by enzymes A and

B respectively.





a) Name reaction I and II

2mks

Reaction I

Reaction II

b) Give an example of

i) Structural proteins 1mk

(ii) Functional protein 1mk

13. Two populations of the same species of birds were separated over a long period of time by an ocean. Both populations initially feed on insects only. Later it was observed that one population fed entirely on fruits and seeds, although insects were available.

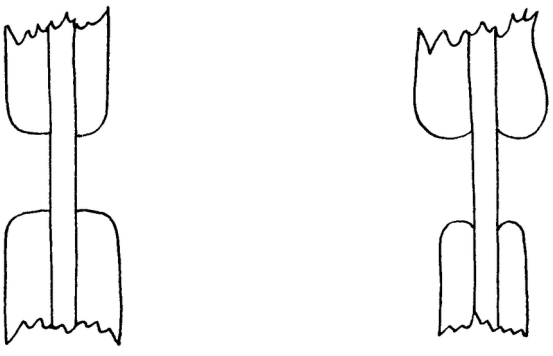
Name

a) The type of isolation 1mk

b) The type of evolutionary change.

1mk

14. The diagrams below show an experiment that was carried out by a student of Friends School Kamusinga.



At the beginning At the end

(i) What is the aim of the experiment 1mk

(ii) Account for the observation at the end of the experiment

2mks

15. The oxidation of a certain fat is represented by the chemical equation shown below.

$C_{57}H_{104}O_6 + 80\ O_2 \longrightarrow 57co_2 + 52H_2O + Energy$

Calculate the respiratory quotient (RQ) of the fat.

2mks

16. State TWO functions of haustoria's in parasitic fungi.

2mks

17. a) Name one waste product that is almost absent in the renal vein but is normally present in the renal artery

1mk

b) Transported in the blood and is not removed by the kidneys.

1mk

18. A leaf of a potted green plant which had been kept in the dark for 24 hours was smeared with petroleum jelly on its lower surface and exposed to sunlight for 6 hours. Starch test on the leaf was negative. Account for the observation 2mks

19. Name two features of alveoli that adapt them to their function.

2mks

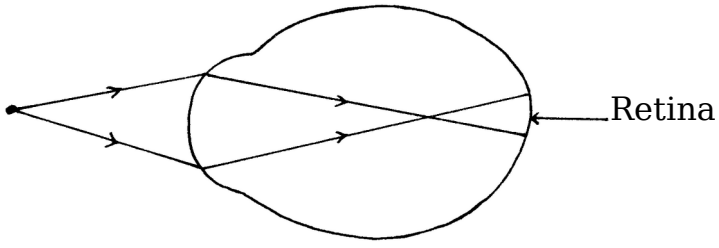
20. a) What type of response does Euglena show when there is an area of brighter light nearby?

1mk

b) State the significance of the above response.

1mk

21. Study the diagram below showing a mammalian eye defect



a) identify the eye defect 1mk

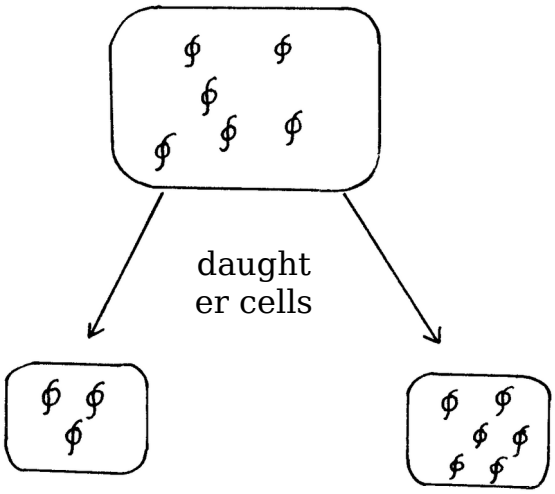
b) How can the above defect be corrected.

1mk

22. Explain why primary productivity in aquatic ecosystem decreases with increase in length.

4mks

23. The figure below shows the nucleus of a diploid cell during early prophase and the daughter cells formed after a cell division.



Which type of cell division will result in the formation of the daughter cells represented by letters X and Y

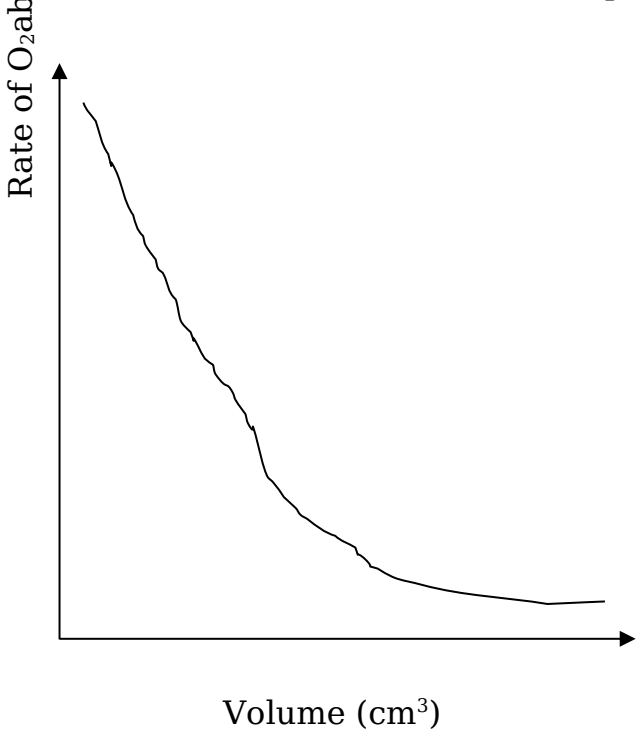
2mks

24. The concentration of urea and urine excreted by a person varies daily . State any factors that will determine the concentration of:-

(i) Urea produced 1mk

(ii) Urine produced 1mk

25. The graph below shows the rate of O_2 absorption by a hydra as it grows.



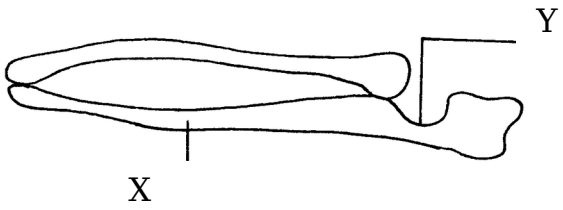
a) What is the relationship between volume of Hydra and the rate of oxygen absorption.

1mk

b) Give a reason for your answer in a(i) above.

2mks

26. The figure below represents a mammalian bone.



a) Identify the bone labeled X 1mk

b) Which bone articulates with this bone at part Y?

1mk

c) Name the type of joint formed with the above bone at point Y.

1mk

27. Red fox has 34 chromosomes in their body cells. The arctic fox has 52 chromosomes. Occasionally the Red and arctic fox mate to give rise to hybrids.

(i) What would be the chromosomal constitution of the hybrid.

1mk

(ii) Explain whether or not their hybrids can bring forth offsprings when they are selfed.

2mks

28. Explain how the following skin structures help in thermoregulation on a hot day:-

(i) Blood vessels; 2mks

(ii) Erector pili muscles.

2mks

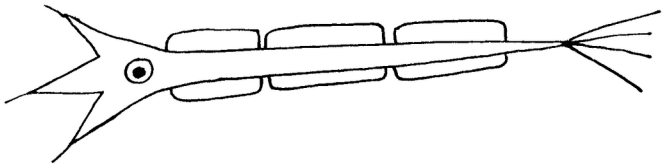
29. Name a human disease that mainly attacks the following blood cells.

2mks

(i) Red blood cells

(ii) White blood cells

30. The figure below shows a neuron



a) Which type of neuron is represented by the diagram

1mk

b) By use of an arrow, show on the diagram the direction to which an impulse will move on the axon.

31. Why is O_2 important in the process of active transport in cells.

32. The data below shows the time taken by cobalt chloride paper to turn pink on upper surface and lower surface when two species of plants labeled X and Y were used.

Species	**Upper surface**	**Lower surface**
X	27 sec	42 sec
Y	35 sec	21 sec

a) What is the likely habitat of the plant species labeled X.

1mk

b)Account for the time taken by the plant species labeled Y.

3mks

MARKING SCHEME

SAMPLE PAPER 6

231 / 1

BIOLOGY.

1. Both have internal folded membrane
   Both contain enzymes
   Both are oval in shape
   Both have double membrane

2. Provide substrate / glucose
   Provides oxygen
3. a. To increase the surface area for enzymatic activities
   b. Contain bacteria which produce cellulose enzyme to act on cellulose
   c. To increase the surface area for digestion and subsequent absorption.
4. i) Convergent
   ii) Analogous
5. a) They lack a cambium
   b) A- cell division
      B – cell elongation / enlargement
      C- lateral / auxiliary bud
6. a) Testis
   b) Within the 1st four months the ovary secretes

Progesterone hormone; which maintains pregnancy

After 4 months the placenta secretes progesterons hormone.

7. - No adequate time for mixing / distribution after the first capture / uneven distribution

After first capture

- Immigration
- Emmigration
- Death of some of the first capture.

8. The bees pollinate the flowers ; of the fruit trees which facilitate fertilization.

9. - Meiosis results in chiasmata formation crossing over / exchange of genes variation occurs. --- Fertilization results from random mating results in variations.

10. Members of one species interbreed; and produce viable offspring;

11. - Uptake of water by roots
    - Movement of water from cell to cell in tissue
    - Opening and closing of the stomata during the day
    - Feeding in insectivorous plants
    - Osmoregulation
    - Support.

12. a) Reaction I condensation

Reaction II hydrolysis

b) i) Keratin / collagen / myosin

ii) Haemoglobin/ Hormone / Antibodies/ Fibribrinogen

13. a. Geographical

b) Divergent evolution / adaptive radiation

14. i) To show that translocation occurs in phloem tissues

ii) Swelling above the ring is due to accumulation of manufactured food because phloem tissues has been removed?

15. $RQ = \frac{57}{80}$

= 0.7125

16. Anchorage / support

Absorption of nutrients from host's tissue

17. a) Urea / uric acid / creatinine

b Carbon dioxide (CO_2)

18. The leaf had stomata on the lower side only which were blocked by petroleum jelly cutting

supply of CO_2 ; hence no photosynthesis.

19. - Have a large surface area
- Moist surface / thin wall
- Highly vascularized
- Have a dense network of blood capillaries
- Numerous in number

20. a. Positive phototaxis

b. Traps light for photosynthesis

c. Myopia / short sightedness

b. Weaving diverging / concave lens/ spectacles

21. - Light intensity decreases with depth hence photosynthesis decreases.
- Temperature decreases hence enzymatic activities decrease.

22. X- meiosis

Y- Mitosis

23. i) Amino acid / protein concentration

ii) Osmotic pressure

24. i) As the volume of hydra increased, the rate of oxygen absorption decreases.

ii) Because as the hydra grew, the surface Area: Volume ration increases.

26. a) Ulna

b) Humerous bone

c) Hinge joint

27 i) 43. Chromosomes

ii) Not possible

- Because the hybrid has odd number of chromosomes hence can't undergo meiosis

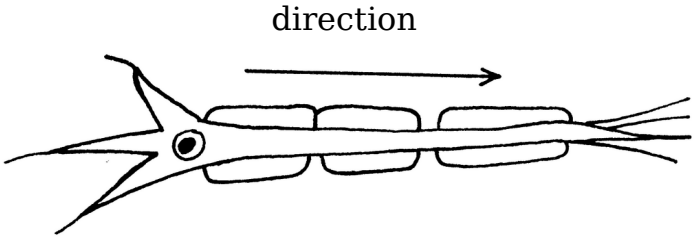
28. i) Vasodilaties ; hence more blood brought beneath the skin and more heat lost by radiation

ii) Contracts ; makes hair stand to trap more air to insulate more.

29. i) Malaria /sickle cell anaemina

ii) Aids/ Leukemia

30. a. Motor neurone



31. Used in respiration ; to provide energy for active transport.

32. a) Aquatic / fresh water.

b) -Has more stomata on the lower surface / epidermis in order to hid stomata from direct sunlight ; and hence reduce rate of transportation and conserve water.

SAMPLE PAPER 7

231/1

BIOLOGY

THEORY

1. (a) What is meant by resolving power of a microscope.
   2mks

b) State the reason behind the addition of iodine solution, to an onion epidermis on a slide while being observed on a light microscope.

1mk

2. a) It is necessary for large organisms to have an elaborate transport system. Explain why.2mks

b) Explain why an Amoeba does not require a transport system.

1mk

3. State the role of Hydrochloric acid in the stomach.

2mks

4. Explain how presence of hairs on a leaf lowers the rate of transpiration.

2mks

5. Account for the osmoregulatory changes that would take place in a marine amoeba if it was transferred to a fresh water environment.

3mks

6. Identify the structural adaptation of a male and female parts of a flower, for wind pollination.

2mks

7. Lamarcks theory of evolution has been rejected by scientist today. Explain why. 2mks

8. State the role played by an exoskeleton in the class insecta.

3mk

9. What is apical dominance?

2mks

10. State the role of the following in digestion in a mammal:

(a) Teeth 1mk

(b) Enzymes 1mk

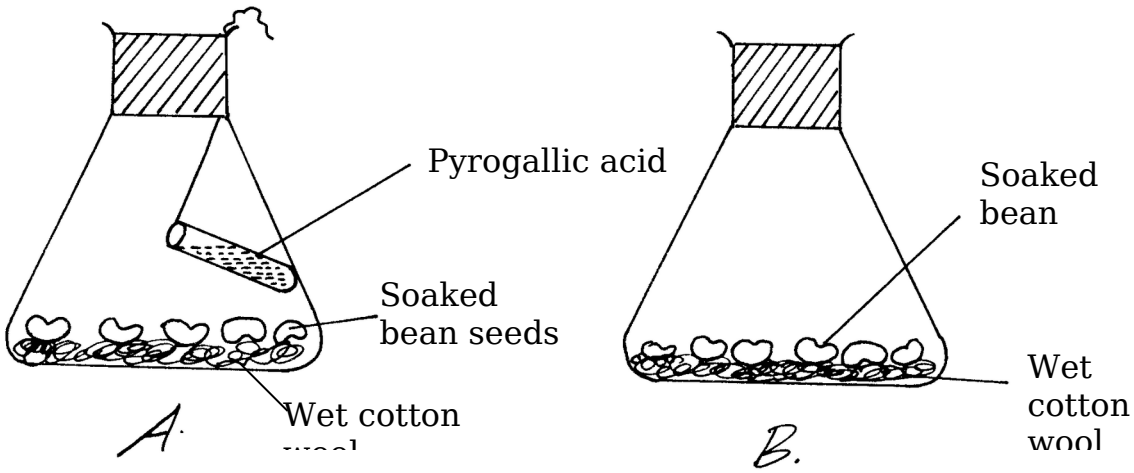
11. When are the following hormones secreted?

(a) Insulin hormone. 1mk

(b) Anti-diuretic hormone. (ADH)

2mks

12. A form three class set up the experiment shown below. Make a careful observation and answer the questions that follow.



If the set up was kept at a room temperature for one week,

(a) What was the aim of the experiment? 1mk

b) Account for the results at the end of the experiment.

2mks.

13. State the importance of sexual reproduction in living organisms.

2mks

14. State the role of saprophytes in an ecosystem.

2mks

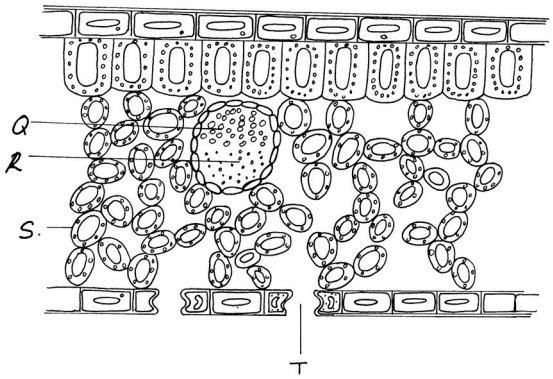
15. List three characteristics that would place man in the class mammalia.

3mks

16. Name two support tissues in plants.

2mks

17 Study the diagram below and answer the questions that follow:



a) Identify the parts labeled: 1mk

b) Explain how water from structure Q reaches structure T.

3mks

18. State how a root hair cell is adopted for its functions.
2mks

19. a) State two ways in which plants get rid of their nitrogenous wastes.
2mks

b) State two adaptations of the nephron for selective re-absorption.
2mks

20. Describe any two ways in which an alveolus is adapted to its functions.
2mks

21. Account for the loss in dry weight of cotyledons in a germinating bean seed. 2mks

22. a) Name the type of responses exhibited by

i) Movement of termites from dry soil towards moist soil.
1mk

ii) Twinning stem on contact with a support.
1mk

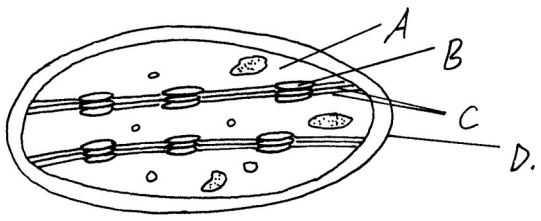
b) State the significance of the responses you have named in a) above.
2mks

23. Name the parts of the mammalian ear that are responsible for:

a) Amplification of sound vibrations.
1mk

b) Regulation of air pressure on both sides of the ear drum.
1mk

24. Study the diagram below and answer the questions that follow.



a) Name the parts labeled:
2mks

b) In which of the labeled parts would:

i) Carbon (iv) oxide fixation occur? 1mk

ii) Light absorption take place? 1mk

25. With reference to inheritance of genetic defects, state the meaning of the term carrier.

2mks

26. Chloroquin has been used for many years since its discovery, for the treatment of malaria, but it is no longer effective. Suggest why it is no longer effective. 2mks

27. Identify the type of muscle found in:

a) Sweat duct. 1mk

b) Heart 1mk

28. Give an account for each of the following:

a) Xylem vessels do not collapse even when they do not contain water.

1mk

b) A mature onion epidermal cell does not lose its shape even after losing water. 1mk

29. a) What are vestigial structures?

2mks

b) State an example of a vestigial structure in man.

1mk

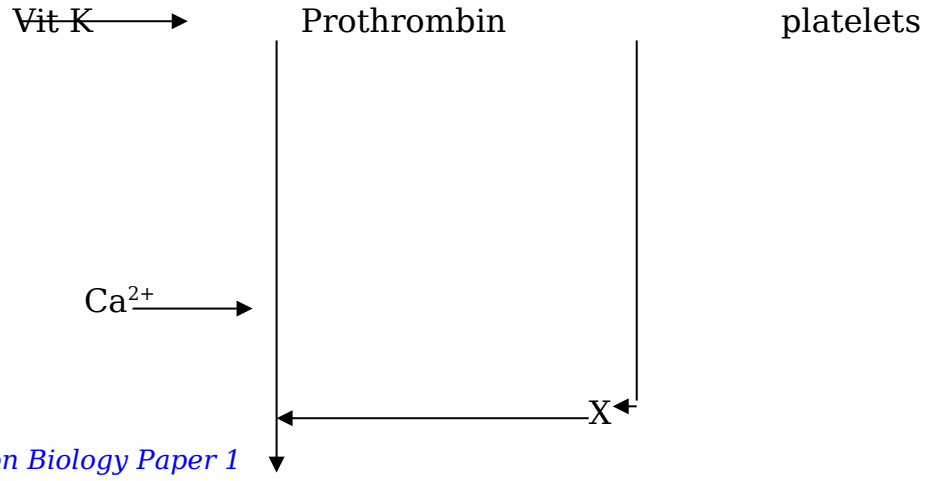
30. A student hammered a nail 1.5 meters high on the stem of a four-year-old tree. Suggest where you would expect to find the nail five years later when the tree will have grown further.

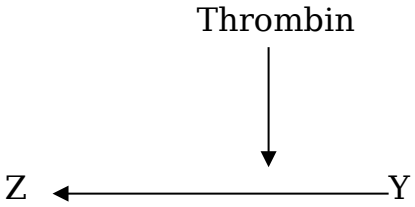
2mks

31. When is a plant cell said to be fully plasmolysed?

2mks

32. Study the flow diagram showing the process of blood clotting and answer the questions that follow:





a) Name the substance labeled X. 1mk

b) State the importance of the substance labeled Z

2mks

MARKING SCHEME

SAMPLE PAPER 7
231/1
BIOLOGY
PAPER 1

1. a) The ability of a microscope to separate images of objects; that lie close to one another;

b) Stains/ colours parts of the cell making it more visible/ clear

2. a) To transport essential substances (O_2/ nutrients) to various cells/ tissues/ various parts of
the body; and to remove wastes from cells/ tissues/ various parts of the body OWTTE

b) It has a large surface area: volume ratio, sufficient for exchange of materials;

3. - Provides a suitable PH for pepsin and rennin
- Kills micro- organisms taken in food
- Activates pepsinogen into pepsin;

4. - The hairs trap moist air in the air spaces; lowering water vapour concentration gradient
leading to low rate of transpiration

5. - More water will enter the amoeba by osmosis; rate of water discharged by contractile
vacuole will increase; more contractile vacuoles formed

6. - The staminate parts have long slender filaments; with large loosely attached anthers
hanging outside;
- The stigmas are long and feathery; to trap floating pollen grains

7. - Acquired characters are not inherited; they are conferred by environment;

8. - Protects the insect against desiccation or drying out
- Provide attachment sites for muscle
- Protects delicate inner tissues
- Protect insect against predators

- Support the body off the ground and gives it form

9. - Inhibition of lateral bud developments; by the terminal bud due to auxins/ plant hormones
(that inhibit lateral bud development);

10. a) Break food into small particles; increasing the surface area for enzymatic action;

b) Break down large complex and insoluble food materials; into simple and soluble materials
that can be absorbed;

11. a) Insulin is secreted when blood sugar level is higher than normal

b) Anti- diuretic hormone is secreted when the osmotic pressure of blood is high

12. a) To show that oxygen is necessary for germination

b) Flash A- No germination since pyrogallic acid absorbed oxygen necessary for germination
B- Germination occurred due to presence of oxygen

13. - Bring about exchange of genetic materials; leading to variation; enabling organisms to
exploit new environments/ resistance to diseases/ high yields

14. - Help in recycling of nutrients; by breaking dead organic materials to simple inorganic
substances (Acc CO_2, NH_3 and mineral salts);

15. - Bodies covered with hair;
    - Homoiotherms/ endoderms/ warm blooded;
    - Young develop in the uterus and nourished by the placenta;
    - Young ones suckled through mammary glands

16. - scelerenchyma;
    - collenchyma;
    - Xylem tissue;

17. a) Q-Xylem tissue
       S- Spongy mesophyll cell;

    b) Water vaporizes from the spongy mesophyll cells into the substomatal air spaces and diffuse through stomata (T); their cells increase in Osmotic pressure hence drawing water from the cells surrounding the vascular tissue (Q);

18. Has an extended projection which increases the surface area for absorption; Its cell sap has a
    higher Osmotic pressure than the surrounding soil water

19. a) - Store them in non- toxic forms in the leaves/ flowers/ fruits/ barks that age and drop
       off from the plant;
    - Store in inner Xylem tissue away from the living cells (e.g. in heart wood);
    - Excludes (gums, resins and salts) from the bark;

    b) - Long, to provide a large surface area for reabsorption
    - Proximal convoluted Tubule is highly coiled; to reduce the speed of movement of the filtrate in order to enhance reabsorption;

- The cells lining the PCT have numerous mitochondria for ATP production; to enhance active reabsorption
- The tubule has thin epithelium; for substance to diffuse across a short distance;
- It has a network of blood capillaries; for quick uptake of reabsorbed substances

20. - Has a moist surface for respiratory gases to dissolve in before diffuse
- Has thin epithelium/ wall for respiratory gases to pass across a short distance
- Has a large surface area for sufficient exchange of gases
- Highly vascularised for quick uptake and unloading of respiratory gases

21. Stored food in the cotyledons is hydrolysed; and translocated to the growing regions for growth and respiration

22. a) i) Hydrotaxis;
ii) Thigmotropism/ haptotropism;

b) Hydrotaxis enables termites move to moist areas and prevent their desiccation; Thigmotropism enables weak stemmed plants to reach higher levels for light for photosynthesis;

23. a) Ear Ossicles (malleus, incus, stapes);

b) Eustachiann tube;

24 a) A- Stroma;
B- Granum

b) I) Stroma (A);

ii) Granum (B);

25. A carrier is a phenotypically normal organism; that carries a recessive gene for a certain defect in a heterozygons state (and can pass it to the next generation)

26. The plasmodia that were susceptible to chloroquin were effectively eliminated; the plasmodia that were resistant survived, passed on their adaptive characteristic and increased in population hence the chloroquin became in effective

27 a) Smooth muscle

b) Cardiac muscle

28. a) Their walls are impregnated with lignin (bars)

b) Has rigid cellulose cell wall;

29. a) These are structures that have reduced in size/ become smaller; and have ceased to be functional

b) Coccyx, appendix, caecum, human hair, piuna muscle and nictitating membrane;

30. The nail would still be on the same mark/ 1.5 mts from the ground since apical growth in plants occur on the apical merislem
The nail would be embedded in the stem/ covered in the stem since the vascular meristems bring about increase in girth;

31. When the cell loses water and become flaccid; and continues to loose water until the cell membrane tears off from the cell wall;

32. a) Thromboplastin/ Thrombokinase;

b) Fibrin prevents further loss of blood; when it hardens/ dries into a scab, it prevents entry
of micro- organisms (into the wound);

SAMPLE PAPER 8

231/1

PAPER 1

THEORY

1. State the function of Neural Canal in cervical vertebra
(1mk)

2. Explain why contractile vacuole in amoeba is surrounded by numerous mitochondria.(2mks)

3. Which substance in cigarette smoke causes lung cancer.
(1mk)

4. State two advantages of metamorphosis to the life of an insect. (2mks)

5. State the role of golgi apparatus, a cell organelle. (2mks)

6. State the structures used by following organisms for locomotion:
   (i) paramecium (1mk)
   (ii) Chlamydomonas (1mk)

7. State two adaptation by a sheep that makes it a better user of food than a dog. (2mks)

8. Give reason why xylem vessel should be dead. (1 Mark)

9. In an investigation, the pancreatic duct of a mammal was blocked. It was found that the blood sugar regulation remained normal while digestion of food was impaired.

   Explain this observation (2 Marks)

10. State two functions of seminal fluid. (2 Marks)

11. Tristearin has molecular formular of C_{57} H_{108} O_6

(i) Write a balanced chemical equation when tristearin is completely oxidized to
Carbon(IV) oxide and water. (IMark)

(ii) Calculate the RQ for the process above. (1 Mark)

(iii) Identify the type of substrate being oxidized giving a reason. (2 Marks)

12. Identify the mode of feeding of the animal whose dental formula is given below.

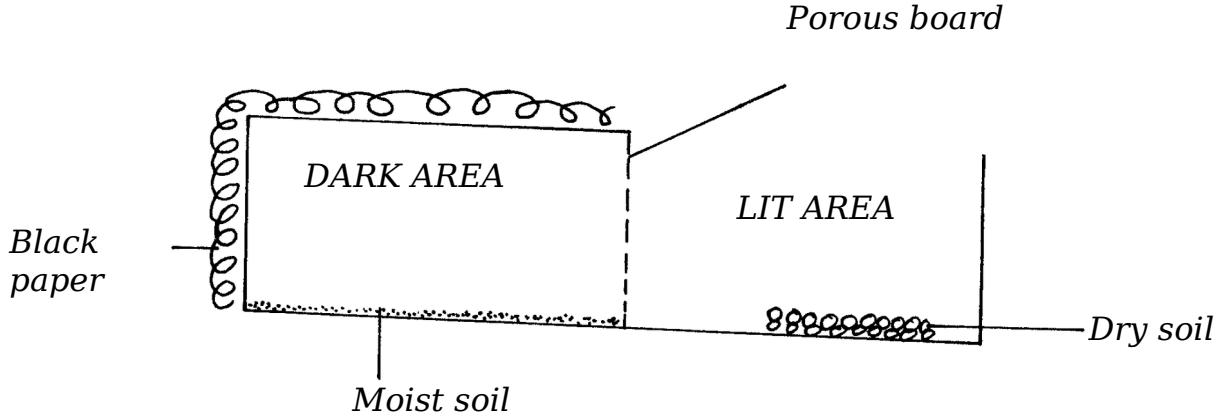
$i\frac{0}{2}, C\frac{0}{0}, PM\frac{3}{3}, M\frac{2}{2}$

(i) Mode of feeding
1mk

(ii) Reasons

2mks

13. A group of Form 4 students set up an experiment. They used a small box in which a portion was covered with black paper and had moist soil. The open part had dry soil, termites were placed inside in open area of the box



(i) Predict what happened to the termites after 30 minutes.

1mk

(ii) What form of response is this. 1mk

(iii) State two biological significance of the above response to termites in their natural habitat.

2mks

14. Below is a nucleic acid strand.

A G C U U A G

(a) Name the nucleic acid

(1Mark)

(b) Give a reason (1 Mark)

(c) Write down the complimentary base paining pattern in the nucleic acid that formed the nucleic acid above l(a).
(1 Mark)

15. State two homeostatic functions of blood clotting.
(2 Marks)

16. State three advantages of polyploidy to a farmer.
(3 Marks)

17. Name three types of skeleton. (3 Marks)

18. State three characteristics of mutations.
(3Marks)

19. State three ways by which nitrogen is converted to nitrates.
(3 Marks)

20. Name the excretory product of marine fish, give reason for your answer.
(2 Marks)

21. State physical processes through which the body of a mammal gain from the environment.
(2 Marks)

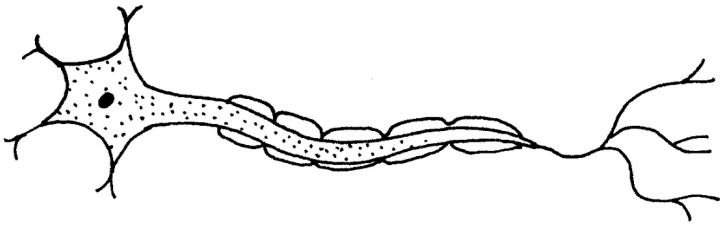
22. State three pieces of evidence that support the organic evolution.
(3 Marks)

23. John stayed with parents in Malindi for eight years. His red blood cell count was about 4.5 million per one millilitre of blood, the family migrated to Kisii town. After one year his Red blood cell count was approximately 6.2 million per One millilitre of blood.

Explain reason for rise in the number of red blood cells. (2 Marks)

24. Name the five kingdoms in hierachical order from the most primiture to advanced kingdom. (2 Marks)

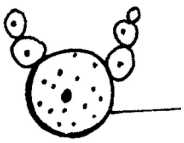
25. Examine the diagram below:



(i) Identify the cell (1 Mark)

(ii) State its function
(1mk)

26. Below is a diagram representing yeast cells.



(a) State the kingdom to which the yeast belong.
(1 mark)

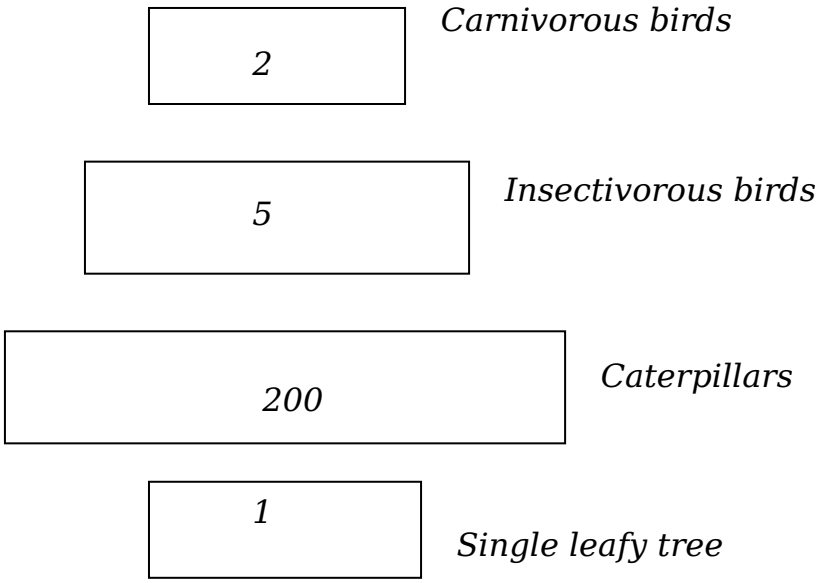
(b) Name the process illustrated by the cells above.
(1Mark)

27. State three factors that affect Basal Metabolic Rate (BMR)

(3 Marks)

28. State two biological significance of nastism. (3 Marks)

29. The diagram below represents an ecological pyramid in savannah ecosystem.



(a) Identify the ecological pyramid. (1 Mark)

(b) A single tree supports other organisms in the ecological pyramid: Why?(1 Mark)

(c) Describe the importance of using dry mass in ecological studies not wet mass.

(2 Marks)

30. "Skeletal muscles contract and relax to bring about movement, this muscles are neurogenic"

What is meant by neurogenic (1 Mark)

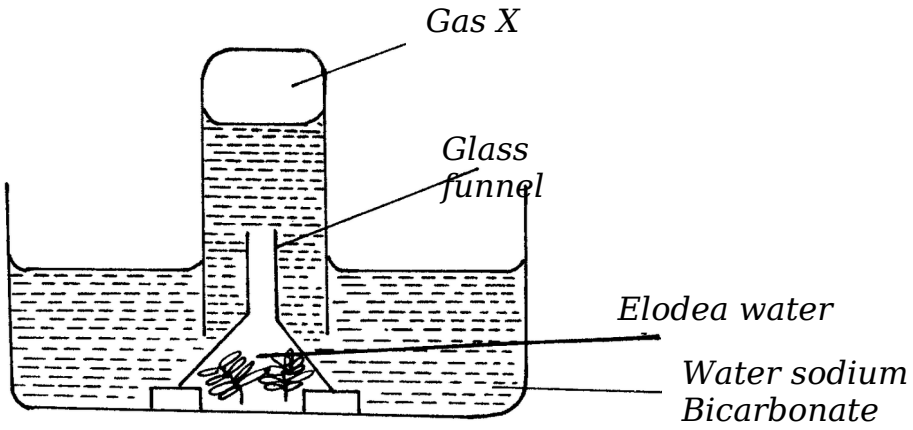
31. State structures used for support in plants. (3 Marks)

32. State the differences between nervous and hormonal communication.

(3 Marks)

33. Apart from photosynthesis state two other uses of plant leaves. (2 Marks)

34. The set up below is used to demonstrate biochemical reaction



(a) Identify gas X

(b) Write a balanced chemical equation to show above process
(1mark)

(c) In which cellular organelle does the process take place.
(1Mark)

(d) What is the role of sodium bicarbonate in the experiment.
(1 Mark)

MARKING SCHEME

SAMPLE PAPER 8

231 / 1

BIOLOGY

1. Passage of spinal cord;
(1Mark)
Rej. Protects spinal cord

2. Excretion of excess water is an active process that need (chemical) energy supplied by mitochondria;

3. Tar ;

4. - Adult and Larvae exploit different food/niches no competition;

- Pupa non-feeding stage, can sense adverse condition;

5. - Processing/packaging of synthesized material;

- Transport/secretion of packaged material; Rej. packing

- Production of lysosomes

6. (i) Cilia;

(ii) Flagellum;

7. - Chewing the cud;

- Presence of cellulase enzymes; (for digestion of cellulose to glucose)

8. - For lignification more strength ;

- Not to absorb water being conducted;

9. - Pancreatic juice containing digestive enzymes is prevented from reaching the food in the

- Insulin (and glucogen) which regulate sugar level is released directly into the blood;

(Blood sugar remain normal).

10. - Contains simple sugars for nourishment of sperm cells;

- Provides medium for sperm motility swimming

11. (i) $C_{57}H_{108}O_6 + 81O_2 \rightarrow 57\ CO_2 + 54\ H_2O$

(ii) $\frac{CO_2 \text{ produced}}{O_2 \text{ Consumed}} = \frac{57}{81} = 0.69$ 0/7

(iii) Fats/liquids/oils; require more oxygen to be oxidized;

12. (i) Herbivorous; Rej. Herbivore

(ii) Diastema;

Presence of hard (horny) pad(against which grass is pressed and cut)

13. (i) Move to the dark area/shaded part;

(ii) Negative phototaxis; Rej. Phototaxis

(iii) Avoid predation

Reduce dessication

14. (a) RNA/Ribonucleic acid, Acc - Messenger RNA/MRNA

(b) Presence of Uracil

c) T C G A A T G C

| | | | | | | |

Rej. If one base not correct

15. Osmoregulation; Ace. Prevent loss of water/salts through bleeding thermoregulation; Acc. Prevents heat loss.

16. Early maturity of crops; Rej. Crops not mentioned High crop yield; Healthy crops due to resistance to diseases; Resistance to pests;

Resistance of crops to drought;

17 Endoskeleton ;

Exoskeleton;

Hydrostatic skeleton; Rej. Hydroskeleton

18. They are rare ;

Controlled by recessive genes; (Acc any three points)

Spontaneous;

Lethal; (it occurs in homozygous state)

19. Nitrogen fixation; (Rhizobium)

Lightning;

Ammonium compounds; fertilizer Ace Habers process

20. Trimethylamine oxide; Ace. Triemethylamine

It requires small amounts/little water to be eliminated ;

21. Radiation; convection; conduction;

Rej. Evaporation (Any 2 points - award 2 marks)

22. fossil records;

Comparative anatomy ;

Comparative embryology;

Comparative serology; (Any three points - award 3 marks)

Taxonomy;

Geographical distribution;

23. Acclimitization; due to low oxygen partial pressure, numerous red blood cells to increase surface area to increase the oxygen carrying capacity;

24. Monera ———— Protoctista ——— Fungi——— Plantae ——— Animalia Rej. The converse

25. (1) Motor neurone;

(ii) Transmit impulses from C.N.S. to effectors ;

26. (a) Fungi;

(b) Budding; acc. multiple budding

27. Glucose;

Oxygen concentration ;

Health ; (Any 3 points - award 3 marks)

Occupation;

28. Protect inner delicate part of flower ;

Reduction of transpiration/water loss reduced;

Regulation of temperature;

Method of obtaining limited nutrients such as nitrogen; (by insectivorous plants)

(Any 2 points - award 2 marks)

29. (a) Pyramid of numbers; Acc. Pyramid of numbers

(b) Has large biomass;

(c) Dry mass gives consistent/accurate mass of matter in an organism;

Wet mass inaccurate/inconsistent due to fluctuation of amount of Water in an organism;

30. Contraction and relaxation of skeletal muscle is initiated/controlled by nervous system;

31. Xylem;

Parenchyma;

Collenchyma; (Any three correct points - award 3 marks)

Scherenhyma;

Nervous Communication	**Hormonal Communication**
- Communication by impulses ; - Quick / specific / localized responses - Short-lined effects	- By hormones; - Slow responses; - Long lasting effects; - Blood; - Involuntary responses ;

- Responses are both voluntary and involuntary	

33 Gaseous exchange;

Storage / vegetative organs;

Transpiration ; cooling effect/temp, regulation '

34 (a) Oxygen ;

(b) $6CO_2 + 6H_2O$ ———— $O_6 H_{12} O_6 + 6O_2 +$ Energy;

c) Chloroplast;

(d) To provide carbon (IV) Oxide gas for photosynthesis ;

Rej. Carbon dioxide

SAMPLE PAPER 9

BIOLOGY

231 / 1

1. List any two distinguishing features of class Arachnida.
   2mks
2. a) What is the importance of Adenosine triphosphate (ATP) in mammals.
   1mk
   b) State 2 functions of respiratory Quotient (R.Q)
   2mks
3. List 2 differences between dicotyledon stem and dicotyledon root
   2mks
4. Sometimes back, Quinine was an effective drug in malaria treatment. Recently and currently quinine drug has been established to be ineffective in treatment of malaria.
   i) Name the protozoa which causes malaria 1mk
   ii) Name the biological process which occurred to the protozoa named in (i) above
   to become ineffective in malaria treatment.
   1mk
   (iii) What is the resultant effect of the biological process named in (i) above after
   long period of time.
   2mks

5. a) State two ways by which plants remove their waste products
2mks

b) What causes accumulation of lactic acid involved in vigorous exercises.
2mks

6. a)(i) Name the hormone responsible for moulting in insects.
1mk

(ii) Where is the hormone named in (i) above secreted.
1mk

b) Explain why Iodine is necessary for complete development of tadpole into adult 1mk

7. In an experiment, it was found that when maggots are exposed to light, they move to
dark areas.

(i) Name the type of response. 1mk

(ii) Give the advantages of this type of response
2mks

8. a) Name the class of food that provides energy to the body under extreme starvation1mk

b) What is the function of the following parts in the mammalian stomach.

(i) Goblet cells …… 1mk

(ii) Chief (peptic) cells ……1mk

9. Give two functions of vacuole 2mks

10. Give the function for the following process when preparing temporary slides. 2mks

i) Sectioning

ii) Fixation

11. Name any two types of Polysaccharides found in plants.
2mks

12. In what ways has man contributed to faster growth of water plants.
2mks

13. State the effect of chlorofluoro carbons (CFCs) in the atmosphere.
2mks

14. a) Why is the mammalian trachea have it’s cartilage rings being incomplete or ‘C’ shaped.
1mk

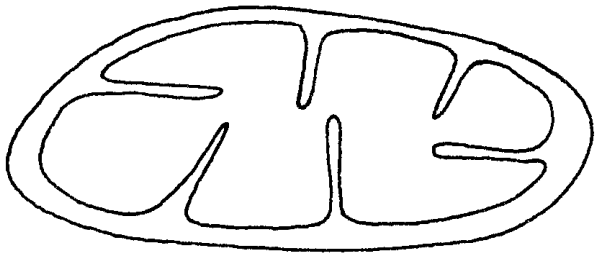
b) List the surfaces used for gaseous exchange in amphibians.
3mks

15. (a) Name the part of female reproductive system where fertilization occur.
1mk

b) State how male sex cells (sperm cells) are adapted tot their function.

c) What is the role of sertoli cells. 1mk

16 a) Identify the organelle below



1mk

b) How is it adapted to its function.
2mks

17. Give two function of exoskeleton found in insects.
2mks

18. Name four environmental causes of mutation.
2mks

19. The 'dolf' is an offspring from a dog and a wolf. This animal is however infertile.
Give a reason for this infertility. 1mk

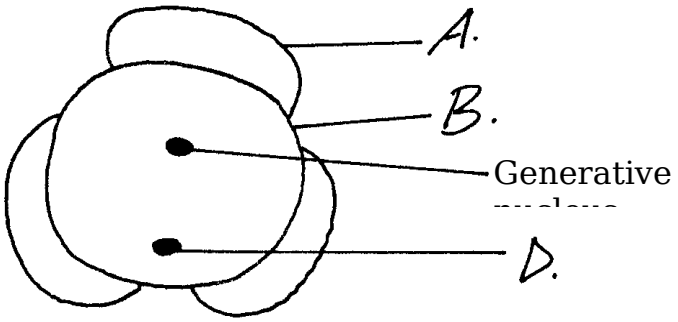
20. Name the type of joints found at the articulation of the following bones.
a) Pelvic girdle and femur. 1mk
b) Humerus and the ulna 1mk

21. a) What are the main end product of photosynthesis.
2mks

b) What raw material are required in dark stage of photosynthesis.
2mks

22. Identify parts of the flower where meiosis takes place.
2mks

23. The diagram below shows a pollen grain. Study and answer the question that follows.



a) Label parts A and B 2mks

b) What is the function of parts labeled D

1mk

24. The table below shows blood composition of Hirji, Rose and Okumu

Person	Hirji	Rose	Okumu
Red blood cells (mm^3)	7,900	6,000	2,100
White blood cells (mm^3)	60	7,000	6,000
Platelets	260,000	270,000	600

a) Which person is likely to live at high altitudes 1mk

Reason 1mk

b) Which person's blood is likely to have an iron deficiency in his diet. 1mk

Reason 1mk

25. Explain the effect of an enzyme inhibitor e.g. cyanide in the translocation of manufactured food from the leaves to other parts of the plant.

2mks

26. a) What is nitrogen fixation. 1mk

b) In what form do plants take up nitrogen.

1mk

27. What is the function of Eustachian tube that links the middle ear with the throat. 1mk

28. Name the part of the renal tubule where

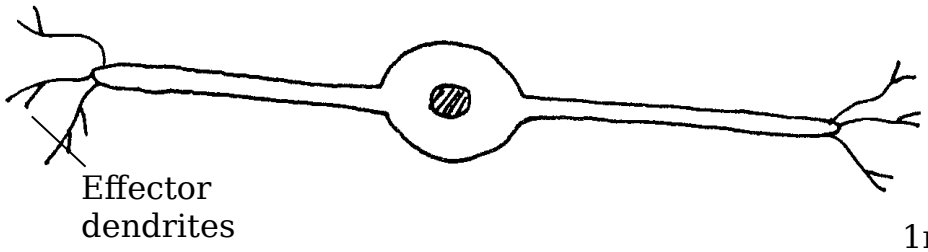
(i) Glucose and amino acids are reabsorbed.

1mk

(ii) Sodium ions are reabsorbed. 1mk

(iii) State one structural modification of nephrons found in desert animals. 1mk

29. a) Identify the type of neuron drawn below



1mk

b) State the function of the neuron named above.

1mk

c) Using an arrow on the diagram show the direction of movement of nerve impulse1mk

30. List 2 factors affecting osmosis.

2mks

31. Give the name of photochemical pigment present in Rods.

1mk

MARKING SCHEME

SAMPLE PAPER 9`

BIOLOGY

231/1

1. - Two body parts
   - 4 pairs of appendages
   - Absence of Antennae

2. a) Chemical compound in which energy is stored in the body

(1mk)

b) (i) Shows type of food being oxidized

(2mks

(ii) Shows whether aerobic or anaerobic respiration

3. Dicotyledon stem — Monocotyledon stem

(i) Vascular bundles arranged on Concentric — (i) xylem star shaped

ring & Phloem in between the rays

(ii) Root hair absent (ii) Root hair present

(iii) presence of pith (iii) Absence of pith (2mks)

4. Plasmodium (1mk)

Mutation (1mk)

Evolution through natural selection (1mk)

5. a) Diffusion of gases through stomata Storage of excretory substance in non toxic forms

Transpiration

Guttation

b) Low/ insufficient supply of oxygen to the tissues (1) resulting to anaerobic transpiration

6. (a) Ecdysone/ moulting (1mk) (ii) Prothoracic of thyroxin gland (1)

(b) Iodine is needed for formation of Thyroxin hormone needed for development of tadpole into adult

7. (i) Negative phototaxis

(1mk)

(ii) Enable the organism escape injurious stimuli and move to favourable one

8. a) Protein (1mk)

b) (i) Mucus secretion

(ii) Secretion of Pepsin and Renin (1mk)

9. - Mechanical support (When non woody plants are turgid)

- Storage (2mk

- Digestion (food vacuole)

10. (i) To allow light pass through the section

(1mk)

(ii) Maintain structure of specimen or (1) to make specimen hard enough for thin sections to be cut

11 - Starch 1✓ mk

- Cellulose 1✓ mk

12. Use of Agrochemical e.g. fertilizers which are washed into water body. Fertilizers (1) encourage
growth of water plants

13. CFCs (Chloro Fluoro Carbons) react with ozone layer depleting (1) it, allowing rays such as ultraviolet
to pass through. Ultra violet rays cause skin cancer.

14. To avoid friction when swallowing/avoid discomfort during swallowing (1)
b) Buccal cavity (1)
- lungs (1)
- Skin (1)

15. a) Fallopian tube (oviduct) (1)
b) - Mitochondrion, to provide energy
- Nucleus - carry genetic materials
- Tail - for locomotion any 2 (2)
- Acrosome - Contain lytic enzyme

c) - Nourishes the sex cells
- Provide support to sex cells

16. a) Mitochondrion (1)
b) Cristae, to increase surface area (1)
- matrix has respiratory enzymes (1)

17. - For muscle attachment
- Protect the inner delicate parts from mechanical danger or injury
- Reduces water loss from the body as the chitin is water proof
(2mks)

18. - Gamma rays
- Ultra violet rays
- x – rays
- Chemical e.g. mustard gas
- Cosmic rays (any 4 ½ mark each)

19. Dog and Wolf belong to the same genus but different species
(1mk

20. a) Ball and socket (rej – hip joint)
(1mk)

b) Hinge joint (rej, elbow joint)
(1mk)

21. a) - Glucose / starch/ carbohydrates
(2mks)
- Oxygen
- Fats and protein (any two)

b) Hydrogen ions
Carbon (iv) oxide (rej. Carbon dioxide)

22. Anthers (2mks)
Ovary

23. a) A- Exine (2mks)
B - intine

b) Responsible for growth of tube nucleus
(1 mk)

24. a) Hirji
Reason; Highest/ most number of RBC
(1mk)
Rej: More/many/numerous

b) Okumu
Reason: has least / fewest/ lowest number of RBC
(1mk
Rej: low; few/ less

25. The inhibitor stops the activity of respiratory enzymes; thus no ATP energy for active transport; hence
no respiration (2 mk)

26. a) Is the conversion of atmospheric nitrogen to a form that can be taken up by plants(1mk)

b) Nitrates (1mk)

27. To balance/ equalize (air) pressure between the middle and outer ear/ surroundings(1mk)

28. (i) Proximal convoluted tubule
(1mk)
(ii) Loop of henle
(1mk)
(iii) Long loop of henle (1mk)

29. a) relay neuron & intermediate/ connector/ associate
(1mk)
b) Passes impulse from sensory neurone to motor neurone
(1mk)



30. Type of solute
Temperature
Difference in osmotic pressure between two solution
(any 2)

31. Rhodopsin (1mk)

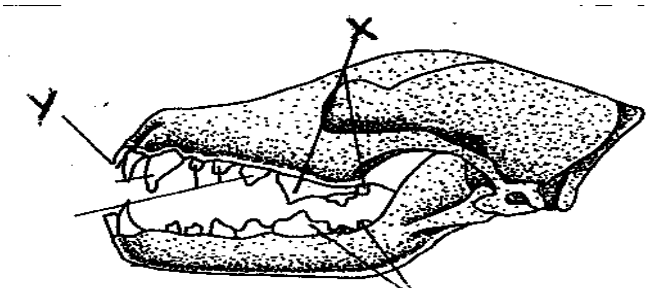
SAMPLE PAPER 10

BIOLOGY PAPER 1

231/1

1. (a) **Name three** characteristics of living organisms
   (3mks)
   (b) Apart from Plantae and Animalia, **name three** other kingdoms.
   (3mks)

2. **Give two** characteristics that distinguish scientific names from common names. (2mks)
3. **State two** limitations of using a microscope to estimate the size of cells
   (2mks)
4. (a) **What** is cell specialization
   (1mk)
   (b) **Name three** types of tissues found in animals
   (3mks)
5. **Distinguish** between osmosis and active transport.
   (2mks)
6. **Describe** what happens during the dark stage of photosynthesis
   (3mks)
7. The diagram below shows dentition of a dog



(a) (i) Name the part labeled **X**

(1mk)

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

(1mk)

(b) **State** how part labeled Y is adapted to its function.

(1mk)

8. **State** the condition to which the body of a mammal use proteins as a source of energy.

(1mk)

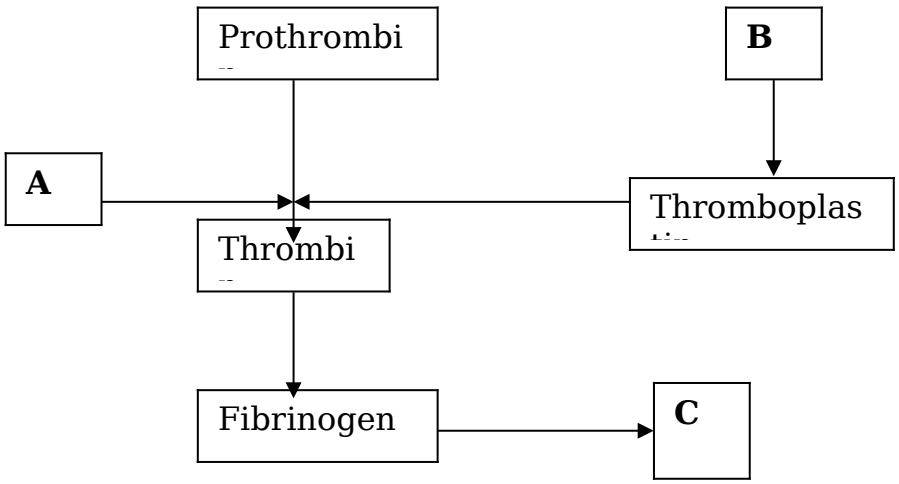
9. **State two** functions of chloride ions in the human body.

(2mks)

10. **Explain** how sunken stomata lowers the rate of transpiration

(2mks)

11. The chart below is a summary of the blood clotting mechanism in man.



Name

(i) the blood cell represented by **B**

(1mk)

(ii) the metal ion represented by **A**

(1mk)

(iii) the end-product of the mechanism represented by **C**

(1mk)

12. How does the heart increase blood flow to some parts of the body during strenuous exercise

(2mks)

13. **Name two** sites where gaseous exchange takes place in higher plants (2mks)

14. **State four** adaptations of respiratory surfaces

(4mks)

15. **Give** the formula for calculating the respiratory quotient (RQ).

(1mk)

16. **State** the economic importance of the following plant excretory products

(a) Caffeine……

(2mks)

(b) Quinine…… .

(1mk)

17. **Explain** why a baby loses more heat per unit weight than an adult when exposed to the same environmental conditions.

(2mks)

18. During a field trip, plant that had flowers drew the attention of a student

(a) **Name** the division of the plant

(1mk)

(b) **Suggest three** possible characteristics one would notice to conclude that it was pollinated by insects.

(3mks)

19. **State two** roles of green plants in a fish aquarium other than providing food for the fish

(2mks)

20. Bivalent, synapsis, crossing over are terminologies used in cell division.

(a) Name the stage of meiosis in which the above process occur.

(1mk)

(b) **Distinguish** between synapsis and crossing over.

(2mks)

21. **(a) State** the role of the following structures.
(i) Placenta.
(2mks)
(ii) Amniotic fluid
(1mk)
(iii) Umbilical cord
(1mk)

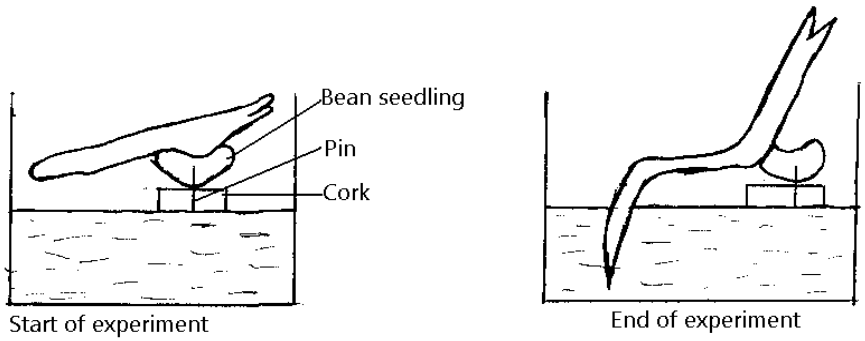
22. **Name** the parts of the flower that are responsible for production of gametes (2mks)

23. During germination and early growth, the dry weight of endosperm decreases while that of the embryo increases. **Explain**
(2mks)

24. **Give two** reasons why cross breeding is better than inbreeding
(2mks)

25. **Identify** each of the following aspects of evolution described below.
(i) Structures that have become functionless in the course of evolution.
(1mk)
(ii) A gradual continuous and irreversible change in organisms over long period of time resulting in the formation of new species from pre-existing ones. (1mk)
(iii) The evolutionary phenomenon in which organs from common ancestral forms became adapted to different ecological niche.
(1mk)

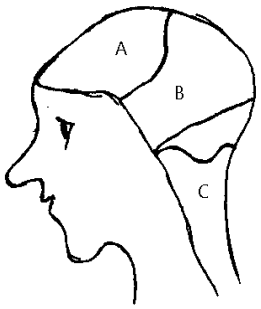
26. An experiment was carried out to investigate a growth response in a bean seedling as illustrated in the diagrams below.



(a) **What** type of response was being investigated?
(1mk)

(b) **Explain** the response exhibited by the root
(3mks)

27. The diagram below shows surface of a human brain.



(a) **Name** the parts labelled A and C
(2mks)

A:

C:

(b) **State** what would happen if the part labeled B was damaged
(1mk)

28. **How** are xylem vessels adapted for support
(1mk)

29. **State three** characteristics of skeletal muscles
(3mks)

30. **Name three** types of harmful drugs used in society
(3mks)

MARKING SCHEME

SAMPLE PAPER 10

231/1

1. (a) Nutrition;
Respiration;
Gaseous exchange;
Excretion;
Growth and development;
Reproduction;
Irritability;
Movement;

Monera;
Protoctista;

Fungi;

Rej: If the name doesn't begin with capital letter
- wrong spelling.

2. (Two names used) first name – generic, second name species;
Two names italicized /underlined
Separately / first names capital, second; name small letter;

3. (i) – Cell vary in shape / irregular – shape;
- Cells vary in size;

4. (a) Structural differentiation / modification of cells to perform specific function;
(b) Epithelial tissue;
Skeletal;
Blood;
Connective tissue; Mark the 1st 3

5. Osmosis – movement of solvent / water molecules from lowly concentrated / dilute / high solvent water molecules to a region of highly concentrated / low solvent / water molecules across a semi –permeable membrane;
Rej. High concentration to low concentration alone.
Acc. Low solute for lowly concentrated.

Cell Membrane: Active transport – movement of particles / ions across a cell membrane from a region of low concentration to a region of high concentration against concentration gradient;
Mark as a whole.

6. Hydrogen atoms / ions combine with carbon(IV) oxide; to form glucose; using energy provided by ATP; (from light stage reaction) Rej. A.T.P

7. (a) (i) Carnassial teeth; Rej. Wrong spelling.
(ii) Have smooth sides and sharp edges;

(b) Chisel – shaped / closely fitting for gripping and stripping flesh from the
bone;

8. During starvation;

9. - Maintain osmotic balance of body fluids;
- Transmission of nerve impulses;

10. Water vapour accumulates in the depression of stomata; lowering the water vapour concentration gradient; (leading to lower rate of transpiration)

11. (i) Platelets; acc. Thrombocytes
(ii) Calcium; acc. Ca^{2+} / Ca^{++}
(iii) Fibrin; Rej. Clot.

12. Stronger contractions / faster contraction / increased heart beat;
- Powerful pumping / powerful systole;
Rej. Strong / Fast contraction alone.

13. Stomata (in leaves)
- Lenticels (in woody stem / young roots);

14. Thin walls / epithelium for faster diffusion of gases;
Rej. Reducing diffusion distance alone.
Moist surface to dissolve gases;
- Large surface area for maximum diffusion/gaseous exchange;
- Highly vascularised / numerous blood capillaries to facilitate / maintain / increase / enhance diffusion gradient;

15. Amount (volume) of carbon (IV) oxide produced . Rej. Removed.
- Amount (volume) of Oxygen used.

16. (a) Caffeine – Increase activity of and adrenaline / heart and respiratory

stimulant.

- Diuretic;

(b) Quinine – Control malaria parasite / plasmodium in Red blood cell;

17. A baby has a large surface area to volume ration than an adult; hence loses more energy per unit weight faster than the adult; Rej. Fast.

18. (a) Spermatophyta; Rej. Wrong spelling.

(b) brightly coloured; Rej. Attractive /beautiful /bright

- Scented / nectates;
- Funnel shaped corolla;

19. Generate oxygen;

Remove carbon (IV) oxide; Rej. Carbondioxide

20. (a) Prophase I;

(b)

Synapsis	**Cross over**
Close association between homologous Chromosome (that lead to pairing up).	- exchange of portion of chromatidis between homologous chromosome;

21. (i) Nutrition / gaseous exchange; excretion

Mark 1st 2

(ii) Acts as shock absorber for foetus; /reduce shock

Rej. Prevent shock.

(iii) Delivers nutrients and oxygen to foetus / take away excretory products;

22. Ovary; Anthers; Acc. Ovules for ovary.

23. Endosperm material was being converted; into new cytoplasm;

24. Cause variation;

- Hybrid vigour gained;

25. (i) Vestigial structures;

(ii) Speciation;

(iii) Divergent;

26. (a) Positive geotropism; Rej. Geotrophism

(b) Due to gravity Auxins migrate to the lower side of the root; causing faster

cell elongation (than upper side); thus the bending of the root downwards;

27. (a) A – cerebrum

C – modulla oblangata; Rej. Medulla alone

Acc. Oblongata alone.

(b) Loss of memory / co-ordination / balance;

28. Lignified / Thickened walls;

29. Striated;

Voluntary

Contract and fatigue rapidly;

30. Stimulants;

- Inhalants;
- Depressants
- Hallucinogens;

Rej. Specific drugs e.g beer, bhang

Mark 1st 2