BIOLOGY MARKING SCHEME

PAPER 1

1. (a) Define the term 'parthenocarpy'. (1mk)

Fruit formation without fertilization having taken place.

(b) Name **two** plant growth hormones that promote parthenocarpy. (2mks)

Auxins

Gibberellins.

2. Name the organelle that performs each of the following functions in a cell

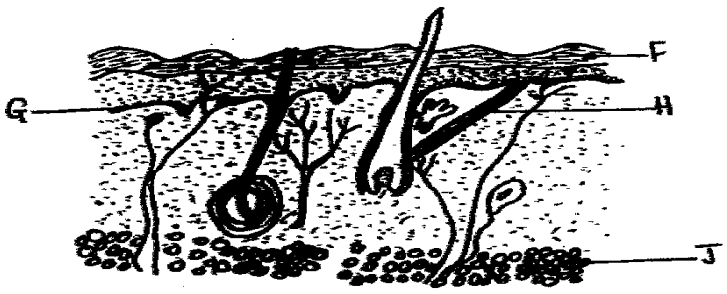
(i) Protein synthesis. (1mk)

Ribosomes.

(ii) Transport of cell secretions. (1mk)

Golgi apparatus / Golgi bodies.

3. The diagram below shows a longitudinal section of mammalian skin.




a) Name the parts labelled **F** and **G.** (2mrks)

**F** Cornified layer

**G** Malpighian layer

b) State **one** function of each of the parts labelled **H** and **J** (2mrks)

**H** Contracts and relaxes to raise and lower hair.

**J** Storage of fats; and insulation against heat loss.

4. Other than carbon (IV) oxide, name other products of anaerobic respiration, in plants. (2mks)

Ethanol

Energy

5. (a) Name the fluid that is produced by sebaceous glands. (1mk)

Sebum

(b) State **two** functions of sweat on the human body. (2mks)

Cools the body.

Has antiseptic qualities hence kills micro-organisms.

6. (a) State **two** characteristics that are used to divide the phylum arthropoda into classes. (2mks)

Number of body parts.

Number of legs

Presence and number of Antenae.

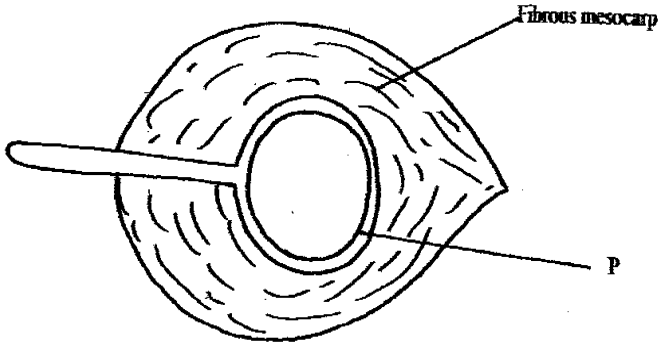
(b)Name the class with the largest number of individuals in the phylum Arthropoda. (1mk)

Insecta.

7. Why are people with blood group O referred to as universal donors? (1mk)

They lack antigens, hence can give blood to all blood groups.

8. The diagram below represents a longitudinal section of a fruit



(b) Describe two adaptations of the fruit for its mode of dispersal (3mks)

(i) Mode of dispersal

Water.

(ii) Adaptation

Has fibrous Mesocarp which stores air; to enable it to float.
Has a tough seed coat which is impermeable to water.

9. (a) What causes the following diseases?

(i) Diabetes mellitus. (1mk)

Hyposecretion of Insulin.

(ii) Diabetes insipidus. (1mk)

Hyposecretion of Antidiuretic Hormone

b) An individual shows the symptoms for diabetes mellitus, how would you determine in the school laboratory whether they are positive for the condition? (3mks)

Take a urine ~~test~~ sample from the patient, put it in a test tube and add ~~the~~ Benedicts solution; boil the mixture and note the colour changes.

10. In an attempt to estimate the number of weaver birds in a small woodland 435 were captured , marked and released. Three days later, 620 were captured 75 of which were marked.

a) What is the name of the sampling method described above? (1mk)

- Capture recapture / Capture, Mark, Release recapture.

b) Calculate the approximate size of the weaver bird population in the woodland. (2mks)

$P = \frac{FM \times SC}{MR}$

$P = \frac{435 \times 620}{75}$

c) Give one disadvantage of this method. (1mk)

Is based on many assumptions which may not hold true.

11. Identify the nucleic acid whose base sequence is shown below.

G-A-C-U-A-G-A-C-G

i) Identify the type of nucleic shown above (1mk)

RNA.

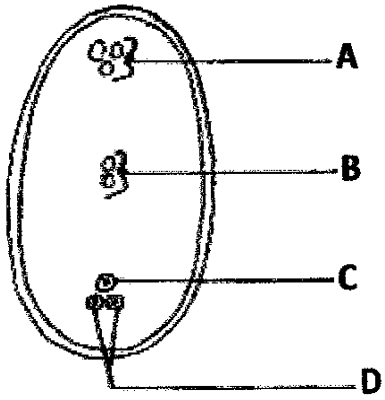
ii) Give reason for your answer in (i) above. (1mk)

Has the base Uracil.

iii) Write the base sequence of a DNA strand for the nucleic acid shown above (1mk)

C-T-G-A-T-C-T-G-C.

12. The diagram **below** shows a mature embryo sac of a flowering plant.



(a) Name the parts labeled **A** and **B** (2mks)

**A** Antipodal Cells

**B** Polar nuclei.

(b) What is the function of the structure labeled B? (1mk)

Fuses with ~~egg cell~~ one male gamete nucleus to form Triploid primary endosperm.

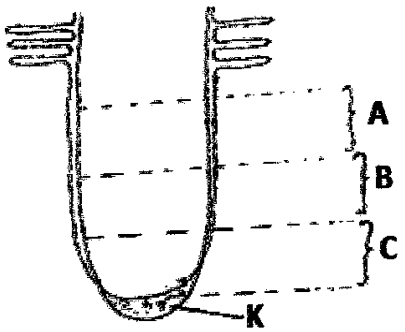
13. (a) Name the tissues that transport water in plants. (1mk)

Xylem.

(b) State why the tissue above is said to be dead. (1mk)

Lacks Cytoplasm and organelles.

14. The diagram **below** shows regions of growth in a root. Study it and answer the questions that follow.




(a) Name the zone labeled **B**

Zone of Cell elongation. (1mk)

(b) State the function of part **K** (1mk)

Protect the delicate ~~appi~~ apical meristem.

(c) State three characteristics of the cells found in zone C (3 mks)

- Lack vacuoles.
- Have thin cell walls
- Are small
- Are actively dividing.

15. The enzymes pepsin and trypsin are secreted in their inactive forms. Explain why they are secreted in these inactive forms. (1mk)

To prevent digestion of the cells that secrete them.

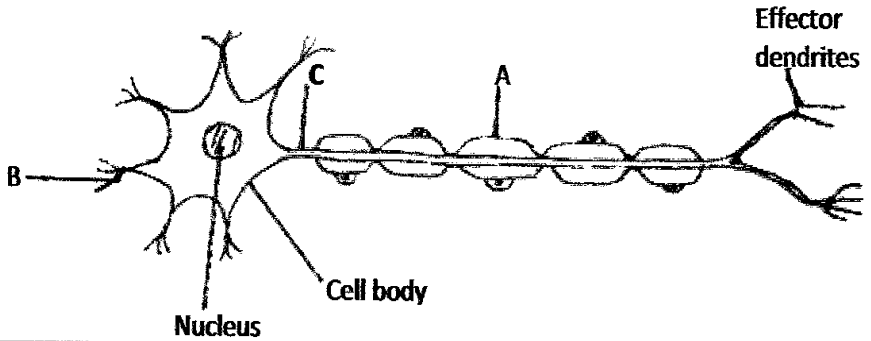
16. (a) Give two examples of natural selection in action. (2mk)

- Resistance of ~~insecticides~~ insects & bacteria to insecticides and antibiotics.
- Industrial melanism.

b) List three features that make man the most dominant species on earth. (3mks)

- Ability to communicate through speech.
- Upright posture.
- A ~~hand~~ modified forelimb ~~is~~ form hand with an opposable thumb

17. Study the diagram **below** of a neurone in human being.



(a) Identify the neurone. (1mk)

Motor

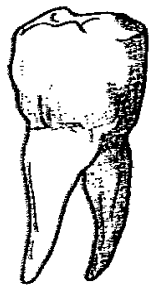
(b) Name the parts labeled.

A Myelin Sheath. (1mk)

B Dendrite. (1mk)

(c) Using an arrow indicate the direction of movement of a nerve impulse along the neuron (1mk)

18. Study the diagram of the mammalian tooth **below** and answer the questions that follow.



(a) Identify the tooth. (1mk)

~~Molar~~ / Pre-molar

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

- Has two roots
- Has cusps.

(c) State **one** adaptation of the tooth to its function. (1mk)

Has a wide top surface to increase surface area for grinding/chewing food.
Has cusps to increase surface area for chewing.

19.a) Name the part of the brain that regulates breathing (1mk)

Medulla oblongata.

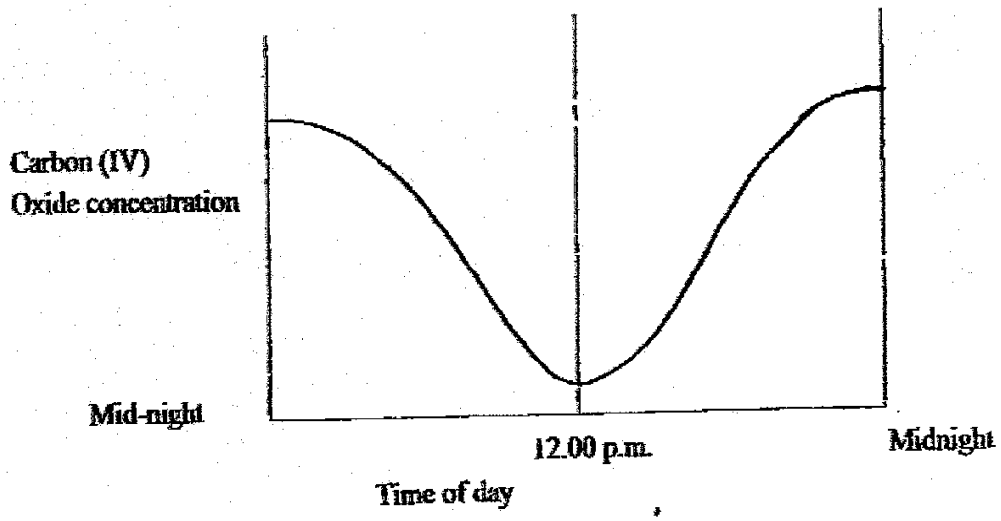
b) Give two ways through which the body responds to increased concentration of carbon (IV) oxide in the blood (2mks)

Increased rate of breathing;
Increased rate of heart beat;

c) Name the structures in pneumatophores through which gaseous exchange occurs. (1mk)

Lenticels.

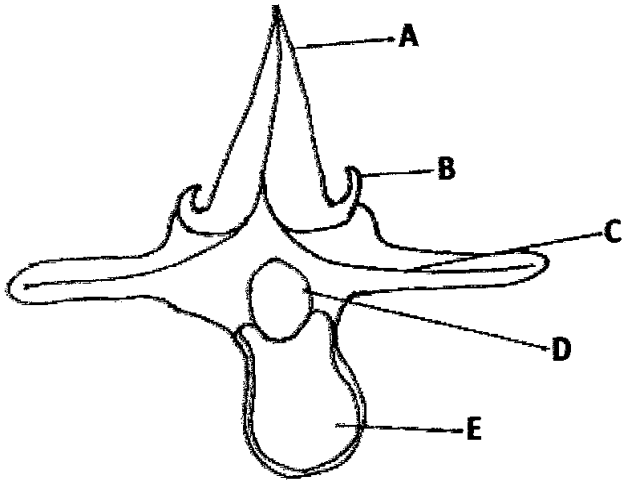
20. The concentration of carbon (IV) oxide in a tropical forest was measured during the course of 24 hours period from mid-night to mid-night.




Account for the results obtained at mid day. (2mks)

Carbon (IV) Oxide concentration is lowest; due to high light intensities; hence high rates of photosynthesis which reduces of $CO_2$ concentration.

21. The diagram **below** represents the anterior view of a certain vertebra.




(a) With a reason, identify the type of vertebra shown **above**. (2mks)

Lumbar.
Reason:- Has large/broad transverse processes;
Has Large neural spine;
Broad centrum; Has metapophyses.

(b) Name the parts labeled.

(i) **A** Neural Spine. (1mk)

(ii) **D** Neural Canal. (1mk)

(c) State the function of part **E**. (1mk)

Supports the trunk.

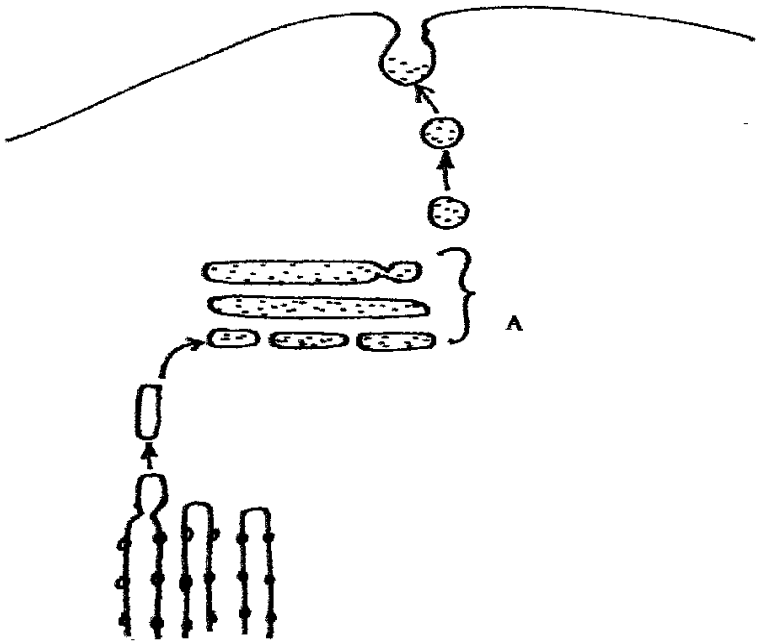
22. (a) State one similarity between diffusion and osmosis (1mk)

Molecules move passively from region of high concentration to region of low concentration.

(b) State two factors that can reduce the rate of active transport (2mks)

- Presence of metabolic poisons
- ~~High~~ Low oxygen concentrations in the cell
- Low glucose concentration in the cell

23. Study the diagram below and use it to answer the questions.




a) Identify the organelle marked A. (1mk)

Golgi apparatus.

b) Give three functions of the organelle named in (a) above (3mks)

- ~~Transport~~ Synthesis and packaging of secretions.
- Transport of glycoproteins.
- Formation of lysosomes.
- Formation of materials that form new cell walls.

24. It was found that during germination of pea seeds 9.3cm$^3$ of carbon (iv) oxide was produced while 9.1cm$^3$ of oxygen was used up.

a) Calculate the respiratory quotient (RQ) of the reaction taking place. (2mks)

Carbon (IV) Oxide Concentration produced
Oxygen Consumed.
$= \frac{9.3}{9.1} = 1.02$

b) Identify the type of food substance being metabolized. (1mk)

Carbohydrates.

25. What is the biological importance of the larval stage during metamorphosis (2mks)

- Feeding and growth.
- Reduces Competition within the species.