

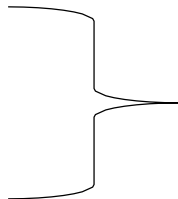
## MARKING SCHEME

1. a) (i) Arachnida;

(ii) 4 pairs of legs;

2 body parts;

Lack of antennae;



b) Presence of exoskeleton;

Having jointed appendages;

Segmented bodies; any 2

c) Dichotomous key is a biological tool for identifying unknown organism up to some taxonomic level;

d) - For identification and placing organism into their correct groups (taxa);

- Classification makes it easier to study organisms in groups and identify the relationships between the groups;

- Helps in understanding evolutionary relationships among living organism;

- Helps us to predict the characteristics of an organism; ( any 2)

2. a) To investigate whether carbon (IV) oxide is produced during respiration by animals;

b) (i) Tube X

White precipitate formed;

Tube Y

Lime water remains colourless;

(ii) Grasshopper produces carbon (IV) oxide which reacts with lime water; during respiration;

- c) Lime water will remain colourless; Angiospermae use the carbon (IV) oxide in the tube for photosynthesis;
  - d) Control set-up;
3. a) A community consists of all living organisms of different species in a habitat interacting with each other; while a population consist of organisms of a given species in a given area over a given period of time;
- b) -Numerous chloroplast that are highly sensitive to trap light of low intensity;
- Large air spaces for storage of air hence buoyancy and parenchyma tissue for storage of Air
  - Have no cuticle to facilitate exchange of gases rapidly;

$$c)(i) \text{ Population} = \frac{FM \times SC}{MR};$$

$$\text{Size} = \frac{374 \times 400}{80} = 1870$$

(ii) Capture-recapture method;

4. a) To destarch the leaves;

b) Concentration of carbon (IV) oxide;

c)

i) Test for starch;

ii) A-Iodine solution turns blue-black

B- Iodine solution it's yellow-brown colour;

iii) A- The leaf had all requirements for photosynthesis hence starch was formed;

B- Carbon (IV) oxide required for photosynthesis was absorbed by KOH;

iv) Comparison;

5. a) Sensory nerve cell;

b) Cell body is located off the axon or outside the CNS;

c) Schwann cell;

d) i) makes contact with CNS or receptor organs thus transmitting impulses;

ii) Insulates the axon or Dendron;

e) i) –Maintenance of body posture and balance;

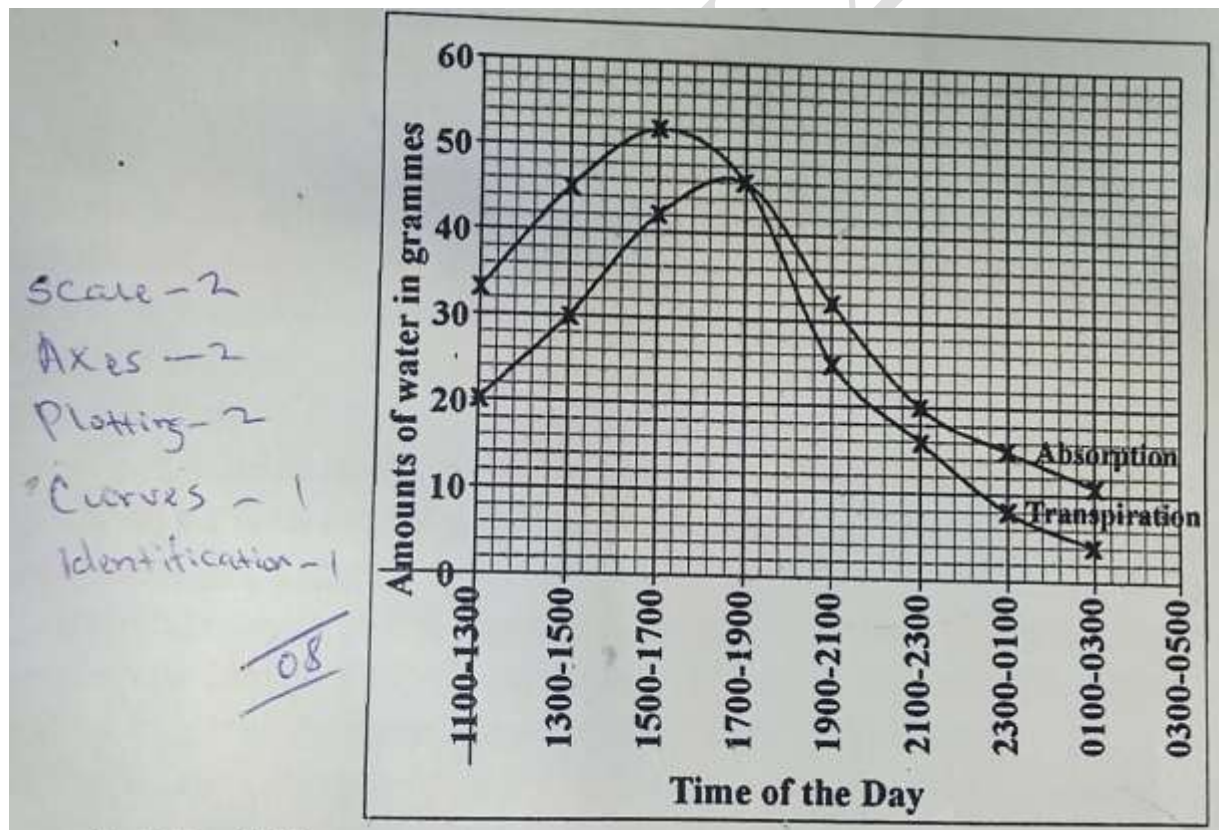
ii) – Controls involuntary movements;

- Controls dilation or constriction of blood vessels thereby influencing blood pressure;any

1

f) Are growth movements/curvatures of parts of plants in response to unidirectional external stimuli;

6. a)



(b) 1700-1900 hours

(c) (i) Transpiration.

1100-1700 hours: Rapid rate of transpiration because of the high light intensity and high temperatures;

1700-0300 hours: Decrease in the rate of transpiration because of the low/ absence of light intensity and reduced temperature of the day; any one

(ii) Absorption.

1100-1900 hours. Increase in rate of absorption of water to replace water lost by transpiration.;

1900-0300 hours: Decrease in the rate of absorption of water due to the decreased transpiration.; any one

(d) Both transpiration and absorption would decrease.

(e) Wind; atmospheric pressure; humidity (any 2)

(f) Wind. Rate of transpiration is high when windy; water vapor is carried away as it diffuses increasing diffusion gradient; when air is still, the rate is lower; because water vapour accumulates on the surface of the leaves. (any 2)

- **Atmospheric pressure:** The rate is high at low atmospheric pressure and low at high atmospheric pressure ;due to the weight of gas column exerted on the leaf surface; any two
- **Humidity:** When low, the rate of transpiration is faster due to high saturation deficit; and when its high the rate of transpiration is low; any two

n/b any one factor well explained.

(g) Transfer of manufactured food substances to the parts where they are required;

(h) Active transport; diffusion/ mass flow; cytoplasmic streaming;  
Any two

7. a) **Opening of stomata using starch-sugar interconversion theory/PH theory.**

Guard cells have chloroplast; Hence in the presence of light photosynthesis occurs in the guard cells; This lowers the carbon (IV) oxide concentration hence reducing acidity/increasing PH in the guard cells; The increased PH triggers off enzymatic conversion of starch to glucose/sugar by enzyme starch phosphorylase; This leads to high osmotic pressure/low osmotic potential in guard cells; Guard cells thus draw water from neighboring epidermal cells; by osmosis; becoming turgid; The inner cell walls of guard cells are thicker than the outer cell walls; Hence during turgidity the outer walls stretch out more causing the stomata to bulge outwards and stomata opens;

b) Resistance to drugs, pesticides, antibiotics, insecticides, fungicides and acaricides; Some strains of bacteria have developed resistance to certain drugs and antibiotics; Some pests have also developed resistance to some pesticides; Some insects have developed resistance to certain insecticides such as DDT; This is because within the population of these organisms, some members develop gene; For resistance to those chemicals which enable them to secrete enzymes which digests those chemicals rendering them useless; The mutated organisms then pass these traits to their offspring thus forming a population of resistant strains; With time new species may arise from such strains of mutated organism;

**Melanism/Industrial melanism**

The peppered moth exists in two forms- the speckled white and the dark form; Melanic form may have developed by mutations; After darkening of tree trunks by soot the population of speckled white moths have decreased due to predation; The population of dark form have increased due to camouflage in dark tree trunk;

**Sickle-cell anaemia traits in malaria zones;**

It is known that there is a high frequency of this mutant gene in places where malaria incidences are high; This is because of those who are heterozygous HbA HbS have immunity to malaria;  
(Any 10 points)

### **8. Role of hormones in the mammalian female reproductive cycle.**

Follicle stimulating hormone (FSH); is secreted from the anterior lobe of the pituitary gland just after menstruation; It causes Graafian follicle; to develop in the ovary; FSH also stimulates tissues of the ovary to produce oestrogen; Oestrogen; brings about healing and repair of endometrium; destroyed during menstruation; Accumulation of oestrogen; stimulates pituitary gland produce Luteinising hormone (LH); Luteinising hormone (LH); stimulates maturation of graafian follicle; The mature graafian follicle releases an ovum into funnel shaped part of the ovary; This is known as ovulation; LH also brings about changing of graafian follicle into corpus luteum; LH then stimulates corpus luteum to secrete progesterone; Progesterone; stimulates thickening of the endometrium; and increases blood supply to the endometrium in preparation for implantation;.

When fertilisation has taken place; progesterone levels increase and this inhibits secretion of FSH; hence no more growth of graafian follicle; when pregnancy fails the corpus luteum degenerates; This reduces the amount of progesterone; the sudden drop in secretion of progesterone causes the endometrium to slough off; and the cycle is repeated;

**N/B source of hormone must be mentioned to score**