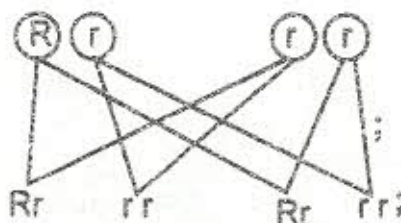


**K.C.S.E 2008 BIOLOGY PAPER 231/2**  
**MARKING SCHEME**

1. a) F - Oestrogen  
G - Progesterone (2 marks)
- b) F - promotes healing/promotes repair (of the uterus)  
G- causes thickening (of the uterine lining)/vascularisation (2 marks)
- c) i) Luteinising hormone (1 mark)  
ii) Causes ovulation; - induces graafian follicle to become corpus luteum; stimulates corpus luteum to release progesterone; (2 marks)
- d) 12<sup>th</sup> to 16<sup>th</sup> day

2. a) Round seed plants- Rr; Wrinkled seed plants - rr (2 marks)
- b) P<sub>1</sub> (i) Rr → R and r/R, r;  
P<sub>2</sub> (ii) rr → r and r/all r/both r/r; (2 marks)

c)



Genotypes Rr, rr

Phenotypes Round seeds; wrinkled seeds;

(3 marks)

- d) - A cross between an individual showing a character for a dominant gene (homozygous/heterozygous) with a homozygous recessive individual;  
- A cross between individual of unknown genotype with a homozygous recessive organism/individual. (1 mark)

3. a) photosynthesis; (1 mark)
- b) light (energy)  
chlorophyll (2 marks)
- c) (i) oxygen - used in respiration; released into the atmosphere  
(ii) glucose- used in respiration; converted into sucrose/starch for storage; used in formation of cellulose cell wall/cytoplasm (5 marks)

4. a) i) Plants  
- Expose the surface area of leaf to sun light for photosynthesis;  
- Ensure flowers are exposed to pollination;  
- Expose fruits/seeds to dispersal; (3 marks)

ii) Animals

- Attachment of muscles; other body organs;
- To protect delicate organs;
- Maintain body shape/form
- Enable movement/locomotion

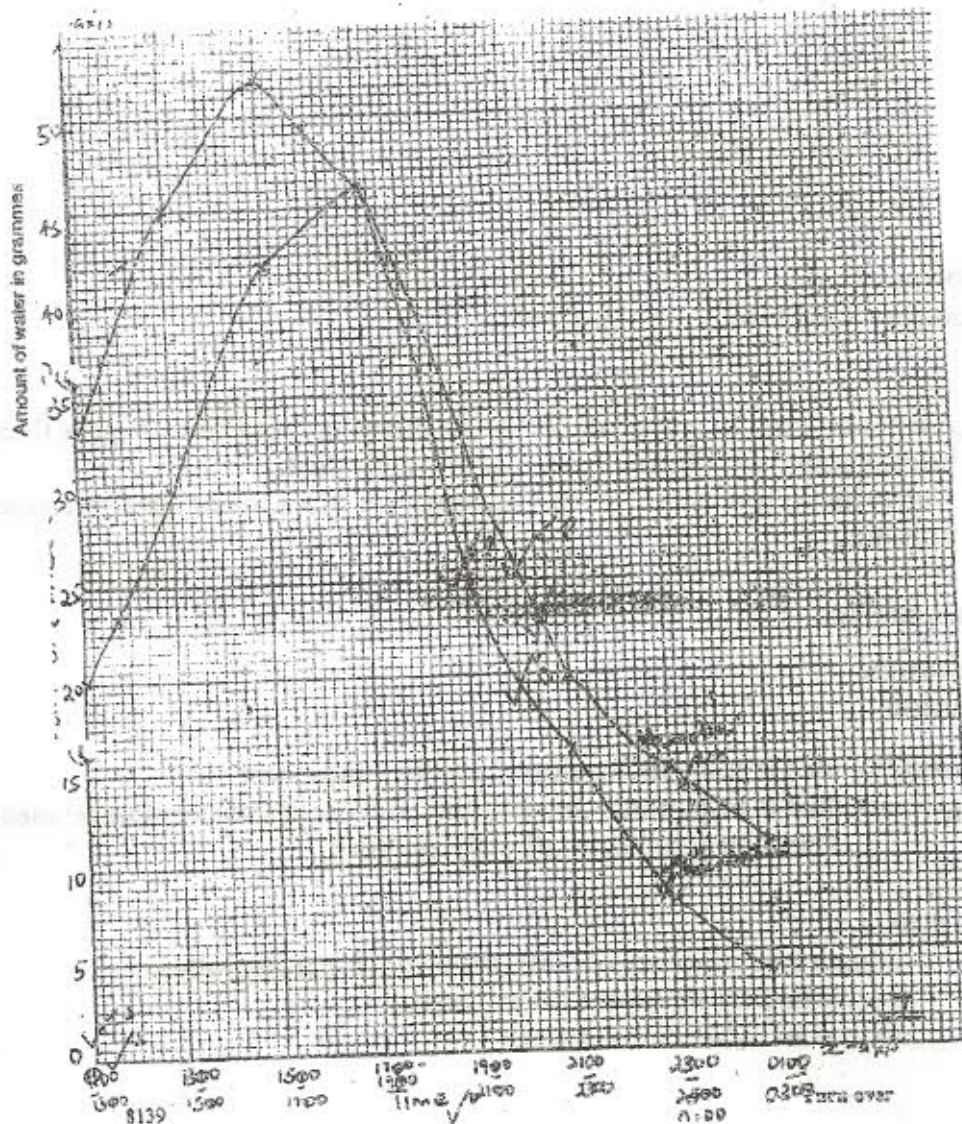
(3 marks)

- b) (i) - Enable animals to search for food, shelter, water  
 - Enables animals escape predators/ harmful conditions; enable animals search for mates; breeding sites. (2 marks)

5. a)  $L_1$  - (Hypotonic solution) - inner cells gained water by osmosis; (becoming turgid) hence increased in length; epidermal cells did not gain water because they are covered by a water proof cuticle; leading to curvature;  
 $L_2$  - (Hypertonic solution) - Inner cells lost water by osmosis; (leading to flaccidity) decrease in length; epidermal cells did not lose water due to waterproof cuticle leading to curvature; (6 marks)

- b) Support in (herbaceous) plants; absorption of water; opening and closing of stomata; movement of water from cell to cell; feeding in insectivorous plants; folding of leaves in mimosa pudica when touched. (2 marks)

6. a)



(7 marks)



b) 1700 – 1900 hrs

(1 mark)

c) i) transpiration

1100 – 1700 hrs: (rapid) increase (in the rate of transpiration); due to high light intensity/ high temperature;

1700 – 0300 hrs: hrs decrease ( in the rate of transpiration); due to low light intensity/ low temperature;

ii) absorption

1100- 1900 hrs: increase (in the rate of absorption of water); to replace water lost - through transpiration;

1900-0300 hrs: decrease (in the rate of absorption of water); due to the fact that the rate of transpiration has declined; (3 marks)

d) Both transpiration and absorption decrease;

(2 marks)

e) wind; humidity; atmospheric pressure; light; temperature

f) wind - rate of transpiration is high when its windy/lower when air is still

humidity - when humidity is low, the rate of transpiration is high/when it is high the rate of transpiration is low

pressure - at high atmospheric pressure the rate is low.

light - at high light intensity rate of transpiration is high/ at low light intensity rate of transpiration is low.

temperature- at high temperature the rate of transpiration is higher/at low temperature the rate of transpiration is low (2 marks)

7. • During thunderstorms/lightning; nitrogen gas combines with oxygen to form nitrogen oxides; nitrogen oxides dissolve in water to form nitric acid; acid is deposited in the soil by rain; nitric acid combines with chemical substance to form nitrates/nitric acid dissociates to form nitrates; which are absorbed by plants;
- Symbiotic bacteria/rhizobium; which are found in root nodules of leguminous plants; fix free nitrogen to nitrates;
  - Free-living bacteria/clostridium/azotobacter; fix nitrogen into nitrates;
  - Nostoc algae/anabaena/chlorella; fix nitrogen to nitrates;
  - Plants use nitrates to form plant proteins;
  - Animals feed on plants and convert plant proteins; into animal proteins.
  - Plants and animals die and are decomposed by bacteria/fungi/saprophytes. Decomposing plants and animals/nitrogenous wastes release ammonia which is converted to nitrites by nitrosomonas/nitrococcus bacteria; nitrites are converted by nitrates; by nitrobacter bacteria;
  - Nitrates in the soil can be converted to free nitrogen/denitrification; by some fungi; pseudomonas

(20 marks)

8. a) - Highly vascularized/network of blood capillaries;  
- Large surface area (for gaseous exchange);  
- Thin membrane/epithelium/one cell thick wall;  
- Moist lining;

(4 marks)

b) **Breathing in**

External intercostal muscles contract; internal, intercostal muscles relax; lifting/raising the ribcage upwards and outwards; muscles of diaphragm contract; hence it flattens; the volume of the thoracic cavity increases; while the pressure decreases; higher air pressure in the atmosphere forces air into the lungs (through the nose);

(8 marks)

**Breathing out**

External intercostal muscles relax; while internal intercostal muscles contract; moving the ribcage downwards and inwards; the muscles of diaphragm relax; hence the diaphragm assumes dome shape; the thoracic cavity decreases; while pressure increases; higher pressure forces air out of the lungs (through the nose);

(8 marks)