

34.4 BIOLOGY (231)

34.4.1 Biology Paper 1 (231/1)

231/1

BIOLOGY Paper 1

MARKING SCHEME Oct/Nov.

2005

**THE KENYA NATIONAL EXAMINATIONS COUNCIL Kenya Certificate of
Secondary Education**

BIOLOGY Paper 1

SAMPLE MARKING SCHEME

SECTION A: (20 MARKS)

1.

Posture balance;

1 mark
2.

(a)

X is chloroplast;

1 mark

Y is vacuole/sap vacuole;

1 mark

(b)

obtain optimum/maximum light intensity

1 mark

(PHELOEM)

- Translocates food to different parts of the plant;

1 mark

(XYLEM)

- Transports water and mineral salts to the leaves for photosynthesis

1 mark

Support and positions the leave (lamina) for photosynthesis; protein synthesis/lipids synthesis;

1 mark
4.

(a)

Organic evolution is the emergence of present forms of organisms gradually from pre-existing ones (some of which no longer exist);

1 mark

(b)

Continental drift is the drifting apart of the continents from one land mass; Arachnida;
5.

Lactic acid;

1 mark
5.

Absorption of water (from soil);

1 mark
- Movement of water from cell to cell:

1 mark
- 7

Mechanical support due to turgidity:

1 mark
- Immature embryo; impermeable seed coat;

1 mark
- Growth inhibitors;

1 mark
- It does not easily dissociate; thereby reducing the capacity of haemoglobin to transport oxygen;

1 mark
9.

Entamoeba histolytica/Entamoeba

2 mar
- ks 1
10.

mark

SECTION B: (40 marks)

11.

(a)

W

(thoracic) Vertebra;

Y

Stemum/stemabra(e)

Z

Intercostal muscle;(extemal/intercostals muscle

3 marks

(b)

External intercostals muscles (Z) contract raising ribs/ribcage upwards and outwards;

Thoracic cavity increases in volume;

Thus the pressure in the cavity is reduced and air is forced into the lungs; .

3 marks

a & b = (6 marks)

12. (a) 3.15:1; 1 mark
- (b) (i) Parents RrXrr:
- Gametes**
-
- Offsprings Rr Rr rr rr; 4
- (ii) 1 : 1; $\frac{Rr}{1} : \frac{rr}{1} = 1 : 1$ marks
- (c) Alternative forms of a gene controlling a particular characteristic; 1 mark (Total 7 marks)
13. (a) E - Malpighian layer;
F - Nerve ending;
G - Erector muscle 3 marks
- (b) (Sweat) from H evaporates leading to cooling of the body;
Removal of excretory products; 2 marks
- (Sebum) from I make hair water repellent/waterproof; makes skin soft and supple;
(Has antibiotic/antiseptic/properties that kill bacteria); Kills bacterial; Any 2 marks (Total 7 marks)
14. (a) (Rate of) transpiration 1 mark
- (a) i) Cut shoot under water; 1 mark
- Apply petroleum jelly to cork-glass connection; 1 mark
- Open reservoir tap;
- (ii) To ensure no air enters leafy shoot; 1 mark
- To ensure the apparatus is airtight; 1 mark
- To remove air bubbles from tubes; 1 mark
- (c) Temperature;
Wind;
Humidity;
Light (intensity) Atmospheric pressure/Air pressure Any three = 3 marks 1
15. (a)(i) Conditions where other floral are positioned above the ovary; mark
- (ii) Male flower/stamens only/male parts only; 1 mark
- (b) Large anthers loosely attached to the filaments; 2 marks
- To be easily shaken in the wind;
- Small/smooth light pollen grains; 2 marks
- To be easily carried by wind; ks (Total 6 marks)

16.	i a)	Bacteria; Fungi;	2 marks
	(b)(i)	Pasteurization/boiling/ultraheat treatment; Food is heated and cooled rapidly to kill micro-organisms;	
	(ii)	Refridgeration/low freezing; Extreme cold - low freezing temperatures render the micro-organisms inactive;	
	(iii)	Canning/too high temperature/tinning/bottling; Food heated under pressure to kill micro-organisms and sealed in a vacuum;	2 marks
	(iv)	Chemical preservatives/pickling; Kill/stop them from multiplying;	
	(v)	Drying;	
	(vi)	Tyndylization;	
			Any 2 marks (Total 6 marks)

SECTION C (40 mark)

17.	(a)	Photosynthesis;	1 mark
	(b)	Carnivorous;	1 mark
	(c)	Aquatic; Terrestrial; algae	1 mark
	(a)	-> Zooplanktons ■ ->Small fish —► Bird J -► Large Bird;	2 marks
	(e	(i) More snails (for bird M);	1 mark
		(ii) Hence increase in population of bird M;	
		(iii) Green plants reduce; as they are eaten by more snails;	
		(iv) Population of large birds may remain constant/decreased /or increased.	1 mark
	(0	Energy is lost through respiration; egestion; excretion Bacteria;	
	(g)(i)	Fungi;	3 mark
		Decomposition;	3 marks
	(ii)	Pollution; farming; fishing;	
	(h)(i)	Deforestation; poaching;	
		Introduction of new species;	
		Farming causes eutrophication	
	(ii)		Any 3 = 3 marks

Pollutants would kill the organisms;
Introduction of new species lead to competition/predation;
Poaching reduce population of organisms;
Deforestation causes soil erosion/nesting/perching sites/ food sources destroyed.

Any 3 = 3 marks

18. Gaseous exchange takes place in spongy mesophyll; During the day air diffuses into large air spaces of spongy mesophyll; through stomata; The carbon dioxide in the air diffuses into photosynthetic cells; in solution form; During photosynthesis CO_2 is used; while oxygen is produced some of the oxygen is used in respiration; while the rest of oxygen diffuses out of leaf; through stomata; During the night, air diffuses into air spaces; (of spongy mesophyll); The air dissolves into film of moisture; The oxygen in the air diffuses into cells; and is used in respiration; during which carbon dioxide is produced; the carbon dioxide diffuses out of leaf; through stomata; due to diffusion gradient; At night carbon dioxide accumulates in the leaf since photosynthesis does not take place;

Some gaseous exchange also takes place through cuticle; Gaseous exchange occurs through epidermis; (of young leaves and stems). Epidermis of the root carries out gaseous exchange with air in the soil; some plants have breathing roots through which gaseous exchange occurs; Gaseous exchange occurs through lenticels (found on older stems); The cork cells at a lenticel are loosely packed; Gaseous exchange takes place between cork and atmosphere within the loosely packed cells;

(Max. 20 marks)

20. Sclerotic layer is made up of collagen fibres; it maintains shape of eyeball; Cornea is transparent curved; thus refracts light rays; Choroids is (a layer of tissue with) black pigment; prevents internal reflection of light in the eye; contains blood vessels; that supply oxygen/nutrients; Retina has rods/cones for colour vision/low light vision; Yellow spot has a high concentration of cones; for colour vision; **Blind** spot has no cones and rods; place where optic nerve leave the eye; optic nerve has (sensory) nerve fibres; for transmission of impulses to brain (for interpretation); lens is made up of elastic; transparent materials; adjust to focus on far or near objects; Ciliary body is made up of muscle fibre; which contract and relax to change shape of lens; Suspensory ligaments hold the lens in position/attach it to ciliary body; Iris is the coloured part of the eye; it has radial and circular muscles; which control size of pupil; Pupil is the small hole at the centre of the iris; through which light passes into the eye; Aqueous humour is a fluid; through which oxygen/nutrients pass to cornea and lens; maintains shape of eyeball; refracts light rays; Vitreous humour is a fluid which maintains shape of eye; refracts light rays.

(Max 20 marks)