

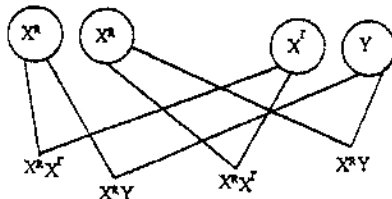
BIOLOGY PAPER 231/1 K.C.S.E 2003
MARKING SCHEME
SECTION A (20 MARKS)

Answer all the questions in this section in the spaces provided.

1. a) Anaerobic respiration / fermentation; Acc. Alcohol production / drawing dough.
- b) Brewing/ Banking.
2. Chordata
3. By pollen tube that grows through style
4. a) Rhizobium
- b) Convert nitrogen into nitrates / convert nitrogen into proteins / convert N₂ into nitrogenous Compounds / foxed N₂ into nitrates.
5. a) Ulna
- b) radius;
 Humerus;
6. Analogous structures – structures which (appear similar and) perform similar functions but have different origins.
Homologous structures – structures which have a common origin but (have evolved to) perform different functions.
7. a) Zone of cell division Acc cell multiplication
 Zone of cell elongation / enlargement; Acc expansion for elongation
- b) To protect root tip
8. Absorption of water; accept absorption of salts / calcium / iron; secretion of mucus
9. a) lignin
- b) Phoem
10. Numerous chloroplasts to absorb light / epidermis have chloroplasts to absorb light.
 - Deeply divided / truncated leaves / branched leaves to increase surface area.
 - Large air spaces for storage of air / buoyancy; acc parenchyma tissue for storage of air
 - Have no cuticle to facilitate exchange of gases
11. Salmonella typhi; Acc.Bacteria / salmonella alone

SECTION B (40 MARKS)

12. a) Genes are located on the sex chromosomes; they are transmitted along with those determining sex.
- b)- Colour blindness
 - Hair ears / pinna
 - Haemophila
 - Baldness
- c) X^aX^a X X^fY ;



Accept Punnett Square

	X^aX^a	X	X^fY
X^a	X^aX^a	X^aX	X^aY
X^a	X^aX^a	X^aX	X^aY

13. a) i) Oxygen
 ii) Carbon dioxide
 b) Oxyhaemoglobin
 c) i) The blood plasma except blood cells and proteins; that has filtered out of the capillaries.
 ii) It is a medium of exchange of substances/ materials between capillaries and body cells; supply nutrients to cells / supply oxygen to cells / remove waste products from cells.
 d) i) Hepatic portal vein
 ii) Pulmonary artery
14. a) Swallow plenty of sea water to increase amount of water in the body
- Have chloride secretory cells in the gills to remove excess salts
 - Eliminate nitrogenous wastes in form of trimethylamine oxide which requires little water for elimination.
 - Few / small glomeruli; thus slow filtration rate in the kidneys.
- b) Less ADH secreted (by pituitary gland); causing less reabsorption of water in the kidney tubules; thus resulting in dilute urine.
15. a) i) Thigmotropism / haptotropism
 ii) Contact with support; causes migration of auxin to enter the side; causing faster growth on the side away from centre of surface (causing tendrils curl around support.)
- b) Escape injurious stimuli / seek favorable habitats; move towards light / stimuli.
- c) Induce foot growth in stem cutting
- Selective weed killers
 - Encourage apical dominance
 - Encourage sprouting of side branches
 - Breaking seeds dormancy
 - Induce parthenocarpy
 - Promotes flowering
 - Induce fruit fall
 - Accelerates ripening of fruits.
16. a) i) study of a single species within a community / ecosystem / habitat / environment.
 ii) Synecology?
 Study of natural communities within an ecosystem
- | | | |
|----|-------------|---------------------------|
| b) | Leaf | Habitat |
| | A | aquatic / fresh water |
| | B | Forest; Terrestrial |
| | C | Arid / semi arid; desert. |
- c) Sunken
 Hairy
 Reserved rhythm
 Small stomatal pore

SECTION C (40 MARKS)

17a)

b) $\frac{80 - 18}{2.5} = \frac{62}{25}; 2.48\text{C /Min}$

c) **Control**

d) Rate was faster in tube A; because the film of methylated spirit evaporated; removing heat from the tube;

e) Convection ; radiation

f) Lower rate of heat loss;

g) i) birds

Feather

ii) Mammals?

Fur

h) i) external temperature changes

Temperature

ii) Internal temperature changes

Hypothalamus

Q 18. Sclerotic layer – (made up of collagen fibres thus) protects the eye maintains shape of eyeball.

Cornea - Allows light to enter the eye
- Refracts light towards retina

Conjunctive - Protects cornea

Eyelids - Protects cornea from mechanical & chemical damage / protects eye form entry of foreign particles.
- protects retina from bright light (by reflex action)

Choroids –(Contains black pigment which)prevents reflection of light within the eye / absorbed light.

-Nourishes the eye / retina / supply oxygen / remove CO₂

Ciliary muscles – Alter shape of lens during accommodation

- Ciliary body produces aqueous humour.

Suspensory ligaments – adjusts shape of lens during accommodation

Lens – Refracts light rays / focuses light on retina

Vitreous aqueous humour once.

Aqueous Humour – Nourishes cornea / lens

Refracts light

Iris – (pigmented thus) – gives the eye its colour / absorbs light controls amount of light entering the eye / adjusts size of pupil impulses.

Pupil – light enters the eyes through pupil.

Retina – has photoreceptor cells / rods / cones / image formation ;l generates impulses.

Fovea / yellow spot – visual acuity / most sensitive part of retina with only cones.

Blind spot – point where nerve fibre emerges from the optic nerve / where the optic nerve leaves the eye / point where blood vessels & nerve fibres enter the eye.

Optic nerve – transmit impulses to brain.

Q19. Water dispersed fruit / seeds

- Mesocarp / seed has air spaces thus light / buoyant to float. Therefore carried away by water.
- The fruit / seeds are protected from soaking by water proof pericarp.
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Animal dispersed fruits / seeds

Presence of hooks for attachment to animals; thus carried to other places
Fruits are brightly coloured; succulent; aromatic attract animals, which feed on them.

The seed coats are resistant to digestive enzymes; thus carried to other places on them.

The seeds are dropped always from parent plant in faeces/ droppings.

Self dispersed fruits / seeds / explosive mechanisms

The dry pods / fruit split (along lines of weakness / sutures)
Scattering seeds away from parent plant

Wind dispersed fruits / seeds

Censer mechanism

Perforated capsule is usually loosely attached to stalk / the long stalk is swayed by wind scattering seeds.

Presence of hairs / wing – like structure, floss / extensions which increase surface area / for buoyancy making it easy for fruits / seeds to be blown away

Fruits / seeds are light due to small size; therefore easily carried away by wind.