

**BIOLOGY PAPER 231/1 K.C.S.E. 1995**  
**MARKING SCHEME**

1. They produce, they grow  
Respond to stimuli/ irritability
2. Protein synthesis – Ribosomes  
Transport of cell secretions – Endoplasmic reticulum
3. Food Spoilage  
Poisoning / cause disease
4. Water in RBC moves out by osmosis and the RBC shrinks
5. Provide energy required for splitting water molecules/ photosynthesis.
6. A - Scrus – acc. Sori  
B- Rhizome
7. Nitrogen  
Making cell walls  
Magnesium / mg
8. Evidence does not support Larmacks theory  
Acquired characteristics are not inherited characteristics are found in reproductive cells only
9. Sickle cell anaemia ( Rej. Bleeders disease)

**SECTION B**

10. (a) K-Enzymes/ Sucrose/ Invertase/ Saccharise  
L- Inhibitor Acceptance any example e.g. any acid
  - (b) – Addition of sucrose/ substrate  
- Optimum/ suitable/ correct / right pH  
- Removal of products
  - (c) - Competed with substance: for active site (of K)  
- Acc. L made the medium acidic; unsuitable for K  
- L occupies active sites
11. (a) A – Epidermis  
B – Pith
  - (b) C – Transport manufactured food / translation; Rej. Digested food  
D – Produces new cells/ divides to give new cells. Accept secondary  
Thickening/ growth/ produces phloem & xylem.  
E- transport minerals salts/ minerals/ salts alone
  - (c) - Xylem in central/ Star shaped  
- Phloem in arms of xylem  
- Root hairs present in root / has pilferous layer  
- No pith in root

12. (a) To absorb CO<sub>2</sub>; reacts with CO<sub>2</sub>  
 (b) To provide moisture to germinating seeds. Accept water for moisture  
 (c) (i)  
 (ii) Oxygen in the tube is taken up for germination CO<sub>2</sub> absorbed by higher pressure outside tube
13. (a) - Green plants – Grasshoppers – Lizards – snakes  
 - Green plants – Grasshoppers – Lizards – Cats  
 - Green plants – Mice – Snakes – Hawks  
 - Green plants – Mice – Snakes – cats  
 (b) – Mice  
 (c) Lizards eat Hawk snakes, Rej. If any primary, tertiary consumer is given  
 (d) (i) Most plants will die / dry  
 (ii) (same) organisms may starve to death  
 (iii) (same) organisms may migrate
14. (a) (i) P – will tend/ grow towards light  
 Q – will remain straight/ little/ no growth  
 R – will remain/ grow straight / Acc. Grow upwards  
 (ii) P – Growth substances or hormones/ auxins/IAA are produced by the stem tip. They move downwards and get disturbed to the side away from the side of light. Where they cause more rapid growth/ cell division/ elongation ( that results in bending)  
 The source of auxin has been removed and the auxins are not affected by light because the area has been covered.  
 (b) Tip will bend towards the light  
 (c) All the seedlings will grow upwards.

### SECTION C

15. (a) - Sigmoid of the curve shown  
 (b) - 92 acc. 93  
 (c)  $\frac{110 - 78}{4} = 8.0$  (cells/ min)  
 (d) 31.5 (mins)  
 (e) (i) A to B Lag phase / slow growth phase  
 (ii) B to C Exponential /log/rapid growth phase  
 (f) Slow/ reduced growth due to limiting environmental factors ( Accept any example) rate of multiplication is almost the same as the death rate, Acc: few cells are still dividing Rej. Growth for multiplication but acc. Reproduction.  
 (g) – Low death rate/ low mortality;  
 - Rej. Decrease in death rate/ reduced death rate  
 - High birth rate/ high fertility acc. Increased birth rate  
 - Improved medical services: Acc. Increased medical facilities  
 - Enough food/ availability of food  
 - Absence of war/ political stability/ peace  
 - Improved standard of living

- (h) Measure the total area of the habitat, throw or mark out the quadrat in the area for the study; at random. Identify label the various species of the plants in the quadrat; count plants of each species; record the numbers, repeat the process (ovtte) work out the average per quadrat for each species in the area/ calculate the population for the total area in Nairobi.
16. (a) (i) Large; brightly coloured corolla/ inflorescence/ florets/ bracts to attract Insect  
(ii) Scented to attract insects  
(iii) Have nectary guides/ nectarines/ that directs insects/ secret nectar to attract insects.  
(iv) Pollen grains rough/ spikey/ sticky/ surface; to stick on insects body  
(v) Special shaped corolla tube; to enable insects to land  
(vi) Anthers are situated inside the flowers to ensure that they are in contact with the insect  
(vii) Sticky stigma; for pollen to stick or to adhere
- (b) (i) Oestrogen  
Repair/ heal endometrium/ wall of uterus; which is destroyed in menstruation  
(ii) Progesterone  
Stimulates the thickening of the uterus; increases the blood supply to the endometrium. Inhibits the production of follicle stimulating Hormone.  
(iii) Luteinising hormone  
Responsible for maturation of the graafian follicles/ causes ovulation/ stimulates corpus luteum; to secrete progesterone.
17. (i) Mammalian Kidney  
Blood reaches the kidney from the renal/ renal artery enters the kidney; then branches into capillaries/ glomeruli/ in the Bowman's capsule, blood vessels leaving the capsule/ efferent are those entering it/ afferent causing high pressure to develop in the glomeruli. This forces the plasma/ causes ultra filtration into the capsule. The filtrate contains waste products (acc. One example) The filtrate moves into the proximal/ first convoluted tubule; where selective reabsorption of glucose amino acids, some water and vitamins take through the loop of henle; excretory products/ urea, excess water and salts acc, one example) pass into the distal tubule, where the remaining useful substance (acc. One example e.g salts and water) are reabsorbed; The filtrate passes into the collecting tubule; where more reabsorption of water takes place: Excess water, urea and salts ( all three must appear)/Urine are removed through the ureter.
- (ii) Green plants  
 $\text{CO}_2$  /  $\text{O}_2$  /  $\text{H}_2\text{O}$  diffuse through the stomata lentils/ hydrathods some toxic wastes are converted into non – toxic substances; these are deposited in certain tissues of the plant/ stored in ageing structures. Resins/ tannins – are exuded though the bark of the stem; or lost during leaf fall.