BIOLOGY PAPER 231/ 1 K.C.S.E 2001
MARKING SCHEME

1. *Interbreed to produce fertile/ viable offspring*
2. *Utilize energy from the sun to manufacture food/ photosynthesis; for subsequent tropic level/ consumers/ other organisms*
3. *A, B, AB, O*
4. *– ovary/ accept ovules*
5. *Act as valves for regulations of food movement/ to close or open various parts of the canal.*
   - Churning (acc. mixing food with enzymes) pushing food along peristals
6. *The surface area to volume ratio is higher in calves than in adults; hence adults retain more heat than the young.*
   - The surface area to volume ratio is lower in adults than in calves; hence calves loose more heat than adults.
7. *– Ribosomes*
8. *(a) Open/ lacuna*
   (b) (i) Hepatic portal vein
   (ii) Pulmonary vein
9. *– Inversion duplication, deletion, translocation, non- disjunction*
10. *– Mesophyll cells/ spongy mesophyll/ palisade mesophyll/ stomata/ substomatal chambers; lenticels; cuticles.*

SECTION B

11. *(a) (i) Efferent arteriole/ vessels*
    (ii) Loop of henle
    (b) Ultra – filtration (acc. Pressure filtration) rej. Filtration
    (c) Glucose (acc. Blood sugar)
    (d) (i) Disease – diabetes mellitus (acc. Sugar diabetes)
    (ii) Hormone – insulin
    (e) – Small Bowman's Capsule/ Groleruli`; Rej few Bowman's capsule
    - Loop of Henle

12. *(a) (i) More active sites of enzymes available, for a large number of molecules of substrate; hence increase in the rate of reaction (rapid of fast increase in the rate of reaction)*
    (ii) B and C
    Enzymes/ substrate are in equilibrium / All active sites are occupied; hence rate of reaction is constant.
    (b) Raising concentration of enzymes
    (c) P^H, temperature, inhibitors/ cofactors
13. *(a) A – Nitrogen fixation*
    D – absorption
    (b) Nitrate/ nitrates/ NO_2
    (c) Denitrifying bacteria/ Denitrifiers
    (d) (i) Leguminous plants, (acc. Legume/ acc examples e.g beans peas)
    (ii) Roots nodules; rej root or nodules alone; acc; root

(e) – Killing / reducing of composers
- Killing/reduction of nitrogen fixing bacteria/ nitrogen fixing microorganisms
- Destruction of leguminous plants

14. (a) *(i) Tt, Tt*
(ii) Tt and Tt
(iii) 1TT; 2Tt; 1tt/ 1 tall homozygous; 2 tall heterozygous 1 short homozygous 1:2:1
(b) *Crossing a homozygous recessive organism with an organism which shows dominant characteristics.*

15. (a) *water, temperature moisture (Acc. Warmth)*
(b) *Mobilize/ hydrolyze stored food/ active enzymes/ breaking Of dormancy softening the testa / seed coat (acc. As a solvent/ transport media.)*
(c) *Setup A – those in set up A will germinate*
Setup B- those in set up B will not germinate
Setup C- those in set C will not germinate

SECTION C

16. (a) (i) *The more the feed the more the feacal output*
The less the feed the less the faecal output
(ii) The first four months

$$\frac{2.1 + 2.0 + 1.8 + 1.7}{4} \quad \left| \quad \frac{28.0 - 20.4}{4} \right. \quad \left| \quad \frac{7.6;\ 1.9\ (kg)}{4} \right.$$

The last two months

$$\frac{14 + 0.1}{2} \quad \left| \quad \frac{29.5 - 28.0}{2} \right. \quad \left| \quad \frac{1.5}{2} = 0.75kg \right.$$

iii) *Fast/ rapid/Active growth hence increase in weight*
The last tow months
Slow growth, reached maturity
iv) *Feed X*
Give reason for your answer
Group A gained (more) weight, on less food while group B lost weight on more food.
b) *growth, repair, protection, energy production*
c) *a solvent, transport medium.. Hydrolyses of food, maintenance of temperature.*

17 a) i) Tympanic membrane.
Receives sound waves (from the air); and vibrates / transforms sound wave into vibrations to transmit them to the ear osssicles / malleus; acc. Hammer for malleus.
ii) Eustachain tube.
Equalizes the air pressure in the middle ear to that in the outer ear.
iii) Ear ossicles

Amplify / transmits vibrations from the tymphanic membrane in the inner ear / venestra ovalis / oval window.

b) *There are three semi – circular canals; arranged in planes at right angle to each other; at the end of each canal is swelling called ampulla's which contains receptors.*
The movement of the cause movement of the fluid in at least one canal, the fluid movement deflects / displaces the coperta and thus stimulating the receptors / sensory hairs, the impulse / nerve sensory impulse is transmitted / conducted to the brain; by auditory nerve, about the movement of the body / head.

18. a) *pollen grains stick in the stigma surfaces; that surface of stigma producers a chemical substance; which stimulates the pollen grain to produce a pollen tube / germinate. The pollen tube/ germinate. The pollen tube grows down (into the tissues of style) from where it derives nutrients; the generative nucleaus divides to give rise to two male nuclei and the antipodal cells; when pollen tubes disintegrates and make nucleus fuses with the egg cell and forms the zygote. The other male nucleus fuss with the two polar nuclei to form a triploid nucleus. The process involves double fertilization.*

b) *Integument change into seed coat / testa; Zygote into embryo;*
Ovary wall into fruit; Ovule into seed; triploid nucleus into endosperm
Style dried up / fall off leaving a scar / corolla dries up (falls off) stamens dry 'up. Ref; Degeneration disintegrates.