K.C.S.E BIOLOGY PAPER 231/1
MARKING SCHEME 2009

SECTION A

1. a Cone-Discrimination of colour/details/accurate vision/colour perception/sensitivity to high light intensity/bright
   b Rods - dim light vision/low light intensity

2. Due to stiff competition of resources leading to elimination/exclusion of one species; Accept currently named example food.

3. Presence of Rhizoids
   - Lack of vascular tissue/absence of both xylem and phloem.
   - Body parts not differentiated/not organized into roots, stem and leaves.

4. Brewing industries; Baking
   - Manufacture of medicines/antibiotics
   - Food e.g mushrooms/yeast also provides vitamin B, & B2

5. Maintenance of constant levels of water/salt/ions/osmotic pressure/for optimum conditions of metabolism/celular functions.

6. Attatchment of powerful Back muscles that maintain posture/flex the verticle column/support visceral/abdominal organs

7. a. Gives evidence of types of plants/animals/organisms tha texisted at a certain geological age/long ago.

   - Gives evidence of morphological/anatomical/structure/changes that have occured over a long period of time.

   b. - Gives evidence of relationship among organisms.
   - Gives evidence of common ancestry of a group of organisms:- e.g structural/ functional relationship among organization.

8. Oxygen is required for respiration that produces energy necessary for active transport e.g oxidation of food for respiration.

9. The adult and larvae exploit different food/Don't compete for food/pupa can survive adverse conditions/pupa being a non-feeding stage enables organisms to go thro' adverse conditions.

10. Curved/sharp/hooked strong beaks for killing/tearing/ripping off flesh from bones.
    - Curved/strong/sharp claws for grabbing/holding prey.

SECTION B

11. (a) X - spongy mesophyll (cell) layer
Y - Cuticle

(b)

(c) - Broad/flat leaf (lamina) to provide large surface area for absorption fo gases.
- Thinness:- allows gases pass through faster.
- Presence of stomata for efficient diffusion of gases
- Presence of air spaces for easy defuse.

12. (a) RR; and rr;

5 (i) Red
(ii) Complete dorminat; (i.e) Red dorminat/white recessive

(c) Ratio of filial generation = 3:1
(i.e) In every 4 flowers 3 are red 1 is white

Therefore 480 Red flowers means 3/4 of total number

Total number of flowers = $\frac{480 \times 4}{3} = 640$

so 1/4 of 640 flowers are white in F_2 plants

$= 1/4 \times 640 = 160$ flowers

13. Heat loss by conduction/convetion from the blood vessels/
(a) the body skin to the cold water; The cooler blood leaving skin enters general circulation cooling the whole body.

(b) Vasconstacton; Thus less Blood flowing to the skin surface reducing heat loss.

- Sweating: Eases heat produced through metabolism
- accept shivering producing heat.

14. (a) Crop
potato/Tomato

Disease
Tomato/potato blight /Acc. Tomato rot

(b) - Use of fungicides
- Eradiction of infected crop/uprooting/burnign of infected plants
- Use of Biological control
- Use of disease resistant varieties
- Crop rotationing

15. (a) (i) 78/88 mg/100 cm 3
(ii) 8.5* and 29.5* / 8min 30 sec and 29 min 30 sec.
(ii) 47mg/100 cc; Acc 47

(b) The demand for Oxygen is more than the supply;
leading to anaerobic respiration
acc lack of O_2 as demanded

(c) Lactic acid is oxidised (to form CO_2 and H_2O)
acc lactic acid converted to glucose/glycogen

16. (a) Genetic variation/hybrid/crossbreed.
(b) Favourable characteristic of parents retained
- exploit parent's favourable conditions
acc New plants adapts parental favourable conditions
- shorter life cycle/early maturity/Faster reproduction
- large/store of food supply
- Independent of two parents/organisms reproduction
- large/store of food supply
- Independent of two parents/organisms reproduce without another/fertilization/ pollination.

17. a (i) Goat
(ii) It is a grazer and a browser

(b) Insufficient grass in bush/aren't adapted to eating twigs/not browsers/are grazers.

(c) (i) Domestic animals ---- total counts
Wild animals -------- total counts/aeria counts/quadrat/Belt transect/capture/ recaputure.
(ii) Analysing gut contents; studying dentition/beaks/claws/month parts.
- Observation
- Examine droppings
- Dissecting a sample of animal/study structure/nature of digestive system/size of caecum/length of intestine/chamber

(e) Irrigation/emigration/migration
Competion: disease
Predation: human activity/man accept any correctly
Parasitism

(f) Poaching; cropping/culling/licensed sport hunting.

- Pollution; Translocation
- Burnign trees, charcoal - deforestation

(g)
- avoid poaching
- Tourism
- Centre of research/education
- Protect human/crops/livestock from wild animals
- Conservation of biodiversity/wildlife/Rare species

18. Inferior lobe of pituitary gland secrets F.S.H which causes grafian follicle develop in the ovary. It also stimulates ovary tissue/ovary/follicle walls secret oestrogen which repairs, heals uterine wall, oestrogen stimulates inferior lobe of pituitary gland produce L.H. for ovulation. It also causes grafian follicle change into corpus interim L. H. stimulates corpus luteum secret Progesterone which causes proliferation of uterine wall; in preparatio of implantation; oestrogen/progestrone inhibits the production of F.S.H (by anterior lobe of pituitary) thus no more follicle develop; and oestrogen productin reduces; 14 days later progesterone level rises; inhibits production of L.H. from anterior lobe of Pituitary gland. Teh corpus luteum stops secreting progesterone, and menstruation occur when the level of progesterone drops; (anterior lobe of pituitary starts secretign F.S.H. again.

19. Broad/wide/flat lamina; provides large surface area for absorption of (O_2) & sunlight
Thin to ensure short distance of CO_2 reach photosynthetic/Palsade cells; presence of stomata/ guard cells; for efficient diffusion of O_2/gaseous exchange/ H_2O vapour/transpiration/CO2 into the leaf; transparent cuticle epiderma cells; for light penetration into palisade cells which contains chloroplasts next to upper epidermis; These receives maximum light for photosynthesis Chloroplasts have chlorophyll which traps light energy. Leaves have veins; xylem and phloem to transport products of phtosynthesis to other parts of the plant.
Air spaces in spongy mesophyll; easily circulates gases/CO2 diffuse into palisade cells.
Mosaic arrangements of leaves; enables leaves to trap sun light.