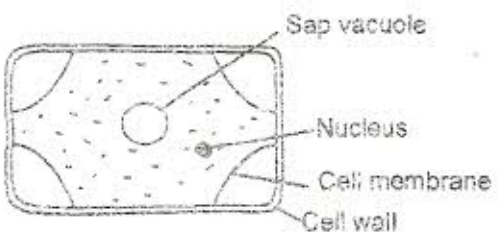
K.C.S.E 2008 BIOLOGY PAPER 231/1
MARKING SCHEME

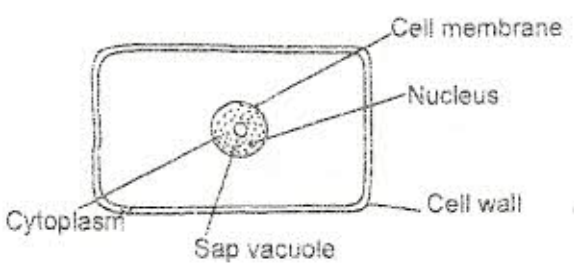
1. a) xylem
   b) phloem
   c) apical meristems (3 marks)

2. a) To remove toxic/ harmful substances/ urea/ nitrogenous wastes from the blood stream. (1 mark)
   b) To return useful substances/glucose and amino acids back into the bloodstream. (1 mark)

3. a) Hepatitis B (accept all types of hepatitis A - E) (1 mark)
   b) i) Vibrio cholerae (1 mark)
   ii) Candida vaginalis/Candida albicans/vaginitis (1 mark)

4. a) The red blood cell was placed in a hypertonic solution /more concentrated/it lost water by osmosis (2 marks)
   b) Start of Plasmolysis End of Plasmolysis (1 mark)





5. a) temperature; pH; co factors, co-enzymes; substrate concentration; inhibitors; product concentration; enzyme concentration. (2 marks)

   b)
   - Increase in temperature increases rate of enzymatic activity upto an optimum temperature.
   - Decrease in temperature inactivates enzymes thus decreases/lowers enzymatic activities
   - Optimum temperature gives maximum/highest enzymatic activities
   - Very high temp. above optimum denatures enzymes
   - Low temp inactivates enzymes
     - pH - enzymes work best at optimum pH; extreme changes in pH denatures enzymes
     - co-factors - activates enzymes increasing their rate of activities.
     - co-enzyme- activates enzymes increasing their rate of activities
     - subtrate conc - increases rate of enzyme activities up to a certain point.
     - enzyme conc- increase in enzyme increases rate up to a certain point.
     - product conc- increase in product conc slows down enzymatic activities.
     - inhibitors - slow down/stops enzymatic activities (any 1 mark)

6. a) Failure of homologous chromosomes/ to segregate during meiosis/ failue of sister chromatids to separate during meiosis (1 mark)
   b) height; weight/mass; length of toe/finger; skin colour/ skin pigmentaion; intelligence (2 marks)

7. a) Preserved remains of dead organisms that lived in ancient times; (1 mark)
   b) When two dissimilar species/structures/organisms of different embryonic origin; change in response to similar environmental conditions. (3 marks)

8. a) anaphase (1 mark)
b) Chromatid pairs move towards opposite poles/ends of the cell; spindle fibres begin to disappear/shorten; (2 marks)
c) root apex/root tip/ shoot tip/base of internode/ tips of lateral buds; young leaves (1 mark)

9. a) Basal metabolic rate/occupation/ activity/workdone (3 marks)

10. (a) Antigen A; B; Rhesus factor/Rhesus antigen/Rhesus D antigen; (2 marks)
(b) pliable/flexible/able to change shape; (1 mark)

11. (a). Ability of organisms to maintain a stable/constant internal environment; (1 mark)
(b) Breathing mechanism/gaseous exchange; Thermoregulation/ temperature regulation; Balance of water and mineral salts/Osmoregulation; regulation of blood sugarlevel/glucose; Regulation of pH in the body fluids. (3 marks)

12. - Transport of protein;
Transport of lipids / steroids; (2 marks)

13. (a) Fovea/Fovea centralis/Yellow spot
(b) Inverted; real; small in size; back to front; reversed; diminished; (2 marks)

14. Growth – Increase / decrease in numbers / change in numbers
Dispersion – Spread / distribution of organisms in a habitat;
Density - the number of individuals of same species per unit area; (3 marks)

15. Muscles respire anaerobically; resulting in accumulation of lactic acid in the tissue; causing fatigue/ muscle cramps (2 marks)

16. (a) Photosynthesis; (1 mark)
(b) Carbon (IV) oxide concentrated /Temp/amount of chlorophyll; (1 mark)

17. (a) Few dividing cells/cells not adjusted to surrounding environmental factors (1 mark)
(b) Most cells fully differentiated/rate of cell division equals rate of cells dying. (1 mark)

18. Transparent to allow light to penetrate photosynthetic tissue; single layer of cells/thin to reduce distance over which light penetrates photosynthetic tissue; presence of stomata for gaseous exchange; closely fitting cells to protect inner tissues. (2 marks)

19. (a) Cardiac muscle; (1 mark)
(b) Contraction of the heart. (1 mark)

20. (a) Circulatory system in which blood passes through two capillary systems before flowing back to the heart/blood passes only once through the heart to complete its circuit around the body (1 mark)
(b) Earthworm/leech/ragfish/Fish (1 mark)
(c) Ostium/Ostin (1 mark)

21. (a) State during which a seed cannot germinate/state of rest before seed germination (1 mark)

(b) Abscisic acid (1 mark)

22. - Large airspaces
- Thin cell walls (2 marks)

23. (a) Canine (1 mark)
(b) Pointed/sharp for piercing/tearing/cutting food (1 mark)

(c) (i) C - prevents degeneration of muscles and cartilages/prevents red spot in skin/maintenance of healthy cells/gums/promotes absorption of iron/prevents scurvy / quick healing of wounds /boost immunity/antoxidants/formation of connective tissue/prevents anaemia (1 mark)
(ii) K- Blood clotting

24. Light reaction - Grana/granum/thyllakoid (membrane)/lamellae
Dark reaction – Stroma (2 marks)

25. Bean Plant - Dicotyledonae; leaves net veined/leaves with petioles/tap root system/cross section of stems showing vascular bundle arranged
Reason - in a ring round pith/cross section of roots have star shaped xylem with phloem in between arms of xylem/floral parts in multiples in/two cotyledons.

Bat - Mammalia
Reason - presence of fur/hair/mammary gland/presence of sweat glands/3 ear ossicles/ presence of diaphragm/2 pinnae (4 marks)

26. (a) Inducing polyploidy/cancer therapy/treatment gout (1 mark)
(b) Meat tenderizer (1 mark)

27. (Anaerobic) micro organisms/bacteria breakdown harmful substances in sewage. (1 mark)

28. (a) Budding (1 mark)
(b) Protandry - stamens/androecium/male parts mature before the carpels of a flower/anthers maturing before stigma.
protogyny - carpels/gynoecium/pistil/female parts mature before the stamens of a flower (2 marks)

29. Cushions foetus against shock/mechanical damage/ provide a suitable medium for embryo to grow/allows movement of foetus/reduces friction /lubrication/ suspends foetus providing support (1 mark)

30. (a) Pelvic girdle/pubic bone/innominate bone (1 mark)

(b) (i) Femur;
(ii) Obturator/ foramen (1 mark)