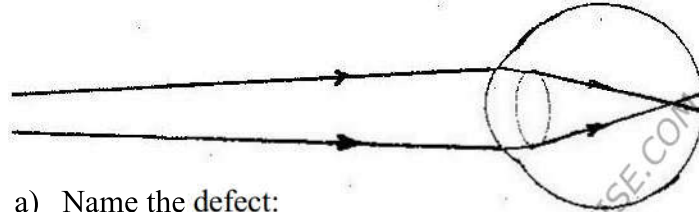


**K.C.S.E 2004 BIOLOGY 231 /1
QUESTIONS**

Section A (20 mks)

- 1.a) Name the cartilage found between the bones of the vertebral column(1mk)
- b) State the function of the cartilage named in (a) above (1mk)
2. Distinguish between natural and acquired immunity (2mks)
3. How is arechyma tissue adapted to its function (2mks)
4. Other than carbon dioxide, name other products of anaerobic respiration(2mks)
5. During which phase of meiosis does crossing over occur. (2mks)
6. The diagram below shows the position of an image formed in a defective eye.

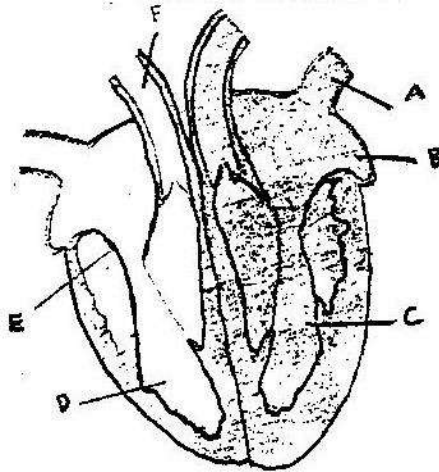


- a) Name the defect:
 - b) Explain how the defect named in (a) above can be corrected 2mks)
7. State the function of the organelles:
- a) Lysosomes (1mks)
 - b) Golgi apparatus (2mks)
8. Name the class in the phylum arthropoda which has the largest number of individuals? (1mks)
 9. Name two mineral elements that are necessary in the synthesis of chlorophyll. (2mks)
 10. How are the xylem vessels adapted for support? (1mk)
 11. Fruit formation without fertilization is called (1mk)

SECTION B (40 MKS)

12. Cross between a red flowered plant and white flowered produced plants with pink flowers.
Using letter R to represent the gene for red colour , and W for white colour
 - a) What were the parental genotypes (1mks)
 - b) Workout a cross between F1 plants (4mks)
 - c) Give the i) Phenotypic ratio of F₂ plants (1mk)
ii) Genotypic ratio of F₂ plants (1mk)
 - d) Name a characteristic in humans, which is controlled through a mammalian heart?

13. The diagram below shows a vertical section through a mammalian heart.



- a) Name the parts labeled A,B,E and F (4mks)
- b) Use arrows to show the direction in which blood flows in the heart. (2mks)
- c) Give a reason why the wall of chamber C is thicker than chamber D (2mks)
14. a) What is the difference between Darwinian and Lamarckian theories of evolution? (2mks)
- b) What is meant by the following terms? Give an example in each case.
- Homologous structures
 - Example
 - Vestigial structures
Example (6mks)
15. a) Give the differences between the following structures in wind and insect pollinated flowers. (3mks)
- Anther
 - Pollen grains
 - Stigma (1mk)
- b) What is the importance of cross pollination? (1mk)
- c) Explain how a seed is formed after an ovule is fertilized (4mks)
16. a) What is diffusion (2mks)
- b) how do the following factors affect the rate of diffusion?
- Diffusion gradient (1mk)
 - Surface area volume ratio (1mk)
 - Temperature (1mk)
- c) Outliner three roles of active transport in the human body (3mks)

SECTION C (40 MKS)

Answer question 17. (Compulsory) in the space provided and either question 18 or 19 in the spaces provided after question 19.

17. During germination and growth of a cereal, the dry weight of endosperm, the embryo and total dry weight were determined at two – day intervals. The results are shown in the table below.

Time after planting (days)	Dry weight of endosperm	Dry weight of embryo (mg)	Total dry weight (mg)
0	43	2	45
2	40	2	42
4	33	7	40
6	20	17	37
8	10	25	35
10	6	33	39

- a) Using the same axes, draw graphs of dry weight of endosperm, embryo and the total dry weight against time (7mks)
- b) What is the total dry weight on day 5?
- c) Account for:
- i) Decrease in dry weight of endosperm from day 0 to 10 (2mks)
 - ii) Increase in dry weight of embryo from day 0 day 10 (2mks)
 - iii) Decrease in total dry weight from day 0 to day 8 (2mks)
 - iv) Increase in total dry weight after day 8 (1mks)
- Dormancy.
- i) Within a seed
 - ii) Outside the seed
- e) Give two characteristics of meristematic cells (2mks)
18. How is the mammalian skin adapted to its functions? (20mks)
19. Explain how a biotic factors affect plants (20mks)