

NANDI EAST DISTRICT JOINT EVALUATION TEST 2009

231/2

BIOLOGY

PAPER 2(THEORY)

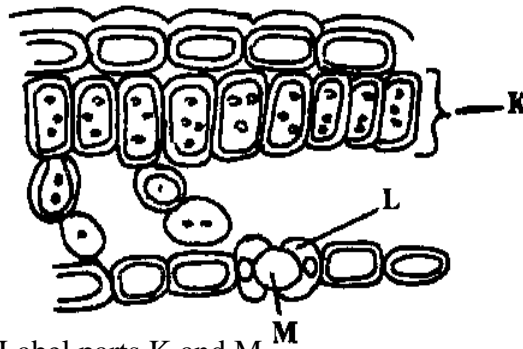
JULY/AUGUST, 2009

TIME: 2HOURS

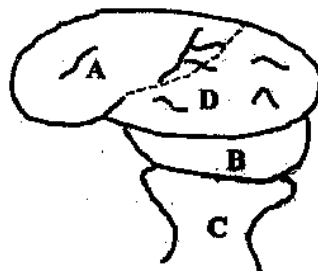
SECTION A: (40 MARKS)

Answer all the questions in this section:

1. Study the diagram below and answer the questions that follow:

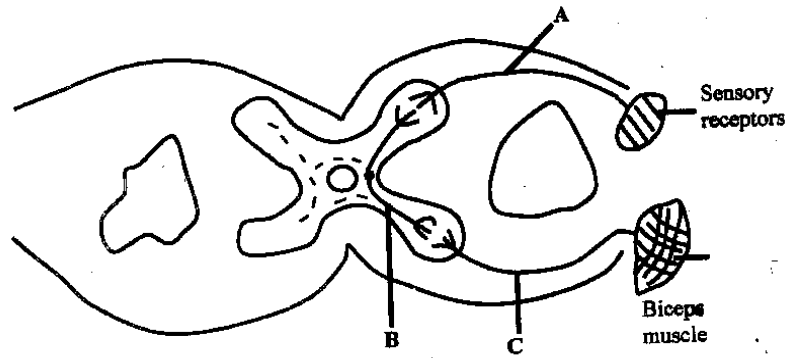


- (a) Label parts K and M
K: _____
M: _____ (2 marks)
- (b) (i) Name the specialized cell labeled L (1 mark)
(ii) State the function of the specialized cell named in b(i) above (1 mark)
- (c) State two adaptations of cell L to its function. (2marks)
- (d) Name the part where maximum photosynthesis occur and give a reason. (2 marks)
2. (a) The diagram below shows surface view of a human brain.



- (i) In an accident a victim suffered from brain injury consequently he had loss of memory.
Which part of the brain labeled above was damaged/ (1 mark)
- (ii) Name the parts labeled B, and C.
(ii) State what would happen if the part labeled b was damaged.(1 mark)

- (b) The feature represents a transverse section through the mammalian spinal cord.



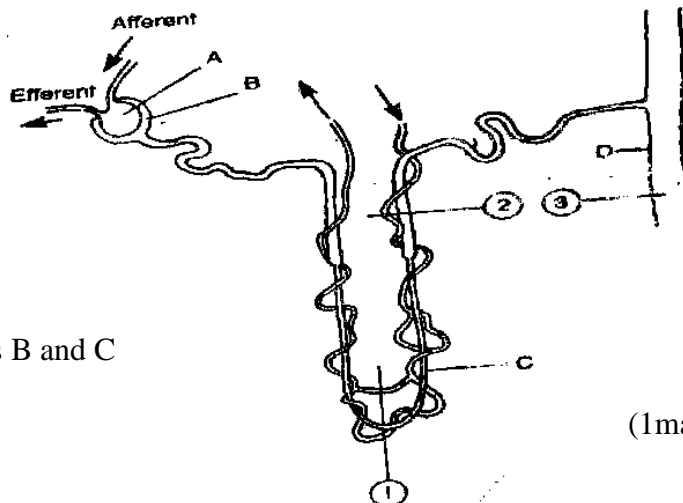
- (i) State **three** differences between A and B.

A	B

- (ii) In the diagram above, indicate the direction of nerve impulse by means of arrows. (1 mark)

3. (a) define the term "Sex-linked genes" (2 marks)
- (b) (i) In man Red-green colorblindness is caused by a recessive gene *c*, which is sex-linked. A colourblind man married to a normal woman transmits the trait to his children. Show the possible genotypes of his children. (4 marks)
- (ii) If one of his daughters married a normal man. What is the probability of having a colourblind son? (2 marks)

4. Study the diagram of a mammalian nephron below and answer questions that follow:



- (a) Label parts B and C
B:
C:

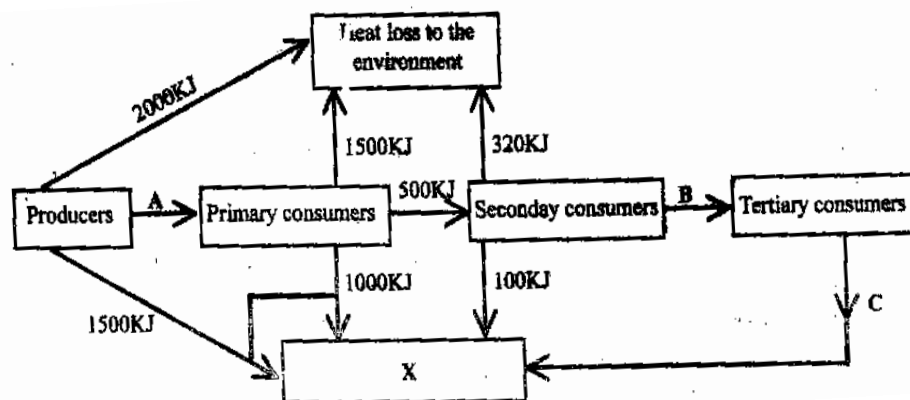
(1mark)

- (b) What happens to concentration of sodium ions in the blood vessels and (2 marks)
- (c) Which hormone controls the amount of water in urine produced in the kidneys (1 mark)
- (d) How will the concentration of urine be affected at region 3 in the absence of the hormone referred to in (c) above? (1 mark)
- (e) Name the process that takes place at region A (1 mark)
- (f) Suggest two adaptive structural differences between nephrons of a desert mammal, for example a kangaroo rat and those of a frog in fresh water. (2 marks)
5. (a) Name two agents of pollination in plants. (2 marks)
- (b) Distinguish between true fruits and false fruits. (2 marks)
- (c) What is the significance of the production of sticky pollen grains in insect pollinated flower. (1 mark)
- (d) (i) Name the parts of a flower which constitute Androecium. (1 mark)
- (ii) Briefly explain any two types of placentation found in fruits. (2 marks)

SECTION B:

Answer questions 6 (compulsory) in the spaces provided and one other question from this section in the spaces provided after question 8.

6. In a Savanna grassland ecosystem the following organisms were identified. Grasses, squirrels, gazelles, lizards, insect's larvae, wild dogs, snakes, hawks, vultures and lions.



- (a) Define the term ecosystem. (2 marks)
- (b) Name the process through which:

- (i) Producers convert sun's energy into chemical energy, (1 mark)
- (ii) Living organisms convert chemical energy into heat energy lost to the environment. (1 mark)
- (c) Identify organism X. (1 mark)
- (d) (i) determine the amount of energy represented by A and B. (1 mark)
- (ii) What is the total amount of energy present within the producers. (1 mark)
- (iii) what is the percentage of energy in the producers which is lost as heat before reaching the tertiary consumers. (1 mark)
- (iv) If 75% of the energy in the tertiary consumers is lost as heat, calculate the amount of energy represented by C. (1 mark)
- (e) Explain briefly why it is advisable to feed one bag of maize grains to man instead of using same bag to fatten steers, then supply beef to the human population. (2 marks)
- (f) From the organisms in the above ecosystem. Construct large clear food web. (5 marks)
- (g) How is ecosystem affected by the following changes?
 - (i) Removing all the dogs (2 marks)
 - (ii) Bush fire. (2 marks)

7. (Optional)

- (a) Explain one factor that influences:
 - (i) Capillarity (2 marks)
 - (ii) Root pressure. (2 marks)
- (b) Apart from the ones named in (a) above, briefly explain the forces involved in movement of water and mineral salts up a plant. (4 marks)
- (c) Describe the role played by the following during absorption of water and minerals in the roots.
 - (i) Osmosis (3 marks)
 - (ii) active transport (3 marks)
- (d) Xylem tissues are used for water and mineral salts transport in plants. Describe three structural adaptations of xylem that enable this function to take place. (6 marks)

- 8. (a) State and explain three evidences of evolution. (9 marks)
- (b) Explain Darwin's theory of natural selection. (11 marks)