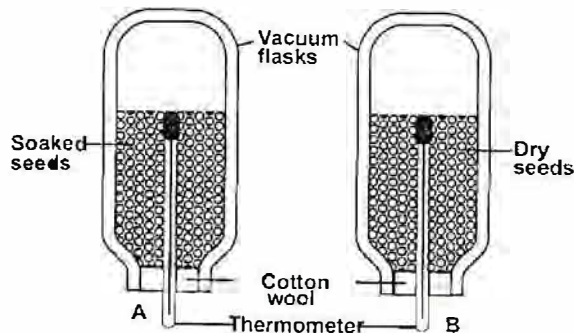


KANGEMA/MATHIOYA FORM 4 JOINT EXAMINATION

231/2

BIOLOGY**PAPER 2****(Theory)****JULY/AUGUST 2016**

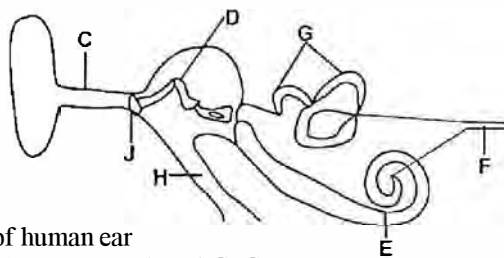
1. A student set up an experiment using soaked and dry seeds as shown below.



State the objective of this experiment.

(1 mark)

- (a) State the observations made in each of the flask after 24 hours. (2 marks)
- (b) Account for the observation made in (b) above. (2marks)
- (c) Suggest why vacuum flasks were used in this experiment (1 mark)
- (d) What alteration would you make in the set up to make the results more reliable? (1 mark)
- (e) Why should the seeds be washed with antiseptic solution. (1 mark)
2. a) Differentiate between the mode of fertilization in higher plants and in mammals (2 marks)
- b) Explain the role of the following hormones in the female menstrual cycle, (2 marks)
- (i) Oestrogen (2 marks)
- (ii) Luteinising hormone (2 marks)
- c) Give two functions of the placenta during pregnancy. (2 marks)
3. The equation below represents a metabolic reaction that occurs in the mammalian liver.
- Amino acids \rightarrow organic compounds + urea
- a. Name the process. (1 mark)
- b. What is the importance of the process to the mammal (1 mark)
- c. What is the source of the amino acids in the process named in (a) above? (1 mark)
- d. State three ways through which organic compounds produced in the reaction are utilized in animal's body. (3 marks)
- e. What is the difference between essential and non- essential acids? (2 marks)
4. The diagram below shows the structure of a human ear.



- a. State functions of human ear (2 marks)
- b. Give the name of structures labeled C, G, F (3 marks)
- c. i) What is the function of the structure labeled H (1 mark)
- ii) Name the structure in ear that detects waves (1mark)
- d. In which structure of the ear is the velocity of the sound transmission fastest (1 mark)
5. A common species of rats has individuals with white, black or grey coats. During a study, a rat with white coat was crossed with a rat with a black coat. Both parents were pure lines. All the off springs in FI generation had grey coats. Using letter B to represent the gene for black coat and W for white coat.
- a) Work out through a genetic cross the phenotypes of the FI generation. (4marks)
- b) Give a genetic explanation of the nature of the offspring in FI generation. (1mark)
- c) State the significance of a test cross in study of genetics. (1 mark)
- d) State the importance of crossing over in meiosis. (1mark)
- e) Name one example of a characteristic in man that is transmitted by multiple alleles. (1 mark)

SECTION B: (40 MARKS)

Answer question 6 (compulsory) and either question 7 or 8 .

6. The table below shows the effect of predation in a laboratory experiment using Paramecium Aurelia and yeast cells, cultured in a solution containing sugar.

Time (hour)	2	4	6	8	10	12	14	16
Paramecium	20	90	120	95	50	20	40	60
Yeast per 15cm ³	60	140	100	65	25	50	80	100

- a) Using the same axes, plot graphs to show curves of Paramecium aurelia and yeast (7 marks)
- b) At what time was the population of Paramecium aurelia and yeast the same (2 marks)
- c) Explain the relationship between Paramecium aurelia and yeast. (2 marks)
- d) What is the approximate time lapse between the maximum population of yeast and maximum population of paramecium? Suggest a reason for this lapse. (2 marks)
- e) Account for the shape of the graph of Paramecium aurelia between :
- 2 and 6 hours (3 marks)
 - 6 and 12 hours (3marks)
- f) i) Suggest what would happen to the population of paramecium if the temperature was lowered to 0°C. (1 mark)
7. Describe the
- Process of inhalation in mammals. (10 marks)
 - Mechanism of opening and closing of stomata. (10 marks)
8. a) Describe how the digestion of a protein is achieved in the following parts of the alimentary canal.
- Stomach (4 marks)
 - Duodenum (4 marks)
- b) i) Describe the process of absorption of water from the root hair to the xylem of the root (8 marks)
- ii) Describe how temperature and light intensity affect the rate of transpiration. (4 marks)