1408/314
BIOLOGY TECHNIQUES
June/July 2011
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

SCIENCE LABORATORY TECHNOLOGY CRAFT

BIOLOGY TECHNIQUES

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;
Scientific calculator (battery operated).

*This paper consists of **TWO** sections; **A** and **B**.*
*Answer **ALL** the questions from section **A** and any **TWO** questions from section **B**.*
*Each question in section **A** carries **4** marks while each question in section **B** carries **20** marks.*

This paper consists of 4 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

Turn over

SECTION A (60 marks)

*Answer **ALL** the questions in this section.*

1. Distinguish between selective and enrichment media. (4 marks)

2. State any **four** reasons for rearing laboratory animals. (4 marks)

3. Define the following terms as used in immunology:

   (i) Immunity; (2 marks)

   (ii) Antibody. (2 marks)

4. State any **four** characteristics of an ideal fixative. (4 marks)

5. Differentiate between the terms anaesthesia and euthanasia. (4 marks)

6. State any **four** physical methods of humane killing of laboratory animals. (4 marks)

7. Give any **four** characteristics of enzymes. (4 marks)

8. Explain why museums set up insectaries. (4 marks)

9. List any **four** roles played by bacteria in nitrogen cycle. (4 marks)

10. Describe the principle underlying the Biuret test. (4 marks)

11. (a) Define the term clearing agent. (2 marks)

    (b) List any **four** clearing agents. (2 marks)

12. Describe how a hanging drop is prepared. (4 marks)

13. Name any **four** physical methods of sterilization. (4 marks)

14. Differentiate between photo-autotrophic and chemo-heterotrophic organisms. (4 marks)

15. State any **four** functions of the kidneys. (4 marks)

SECTION B (40 marks)

*Answer any **TWO** questions from this section.*

16. (a) Figure 1 represents time - course of an enzyme reaction at various temperatures.

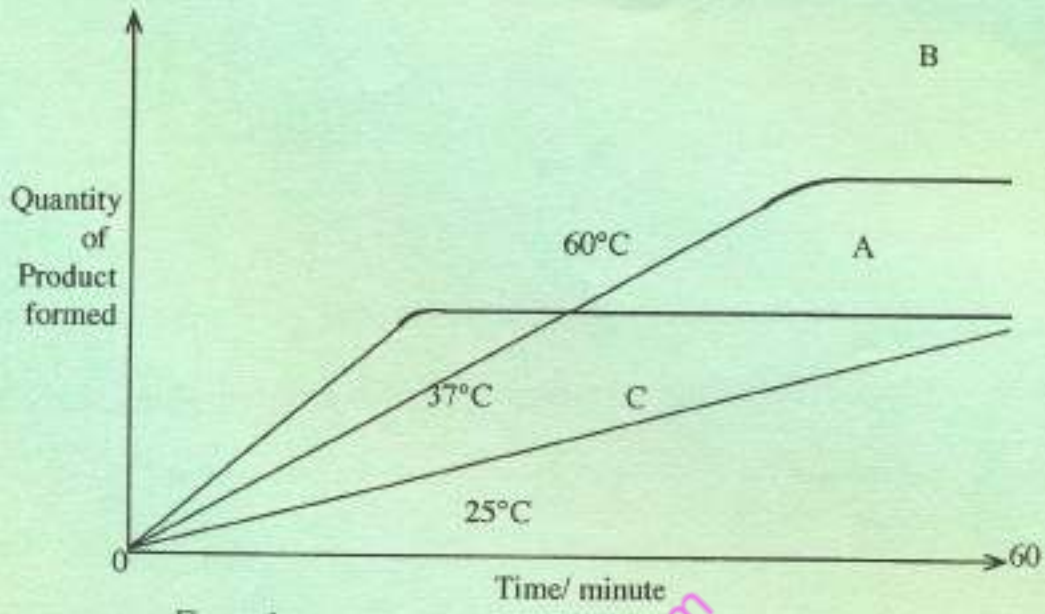

Figure 1.

(i) Explain the shapes of the curves given for the enzymes reaction at different temperatures. (15 marks)

(b) Define the following terms:

(i) Catalyst; (2 marks)

(ii) Substrate; (1 mark)

(iii) Catabolic reaction; (1 mark)

(iv) Anabolic reaction. (1 mark)

17. (a) Describe competition in a natural ecosystem. (8 marks)

(b) Explain how insect pests are controlled in a museum. (9 marks)

(c) State various ways through which energy gets lost from the ecosystem. (3 marks)

18. Compare and contrast photosynthetic and aerobic respiration. (20 marks)

19. (a) List any **six** ways by which soils lose their fertility. (6 marks)

(b) Figure 2 illustrates the interdependence of organisms in an ecosystem.

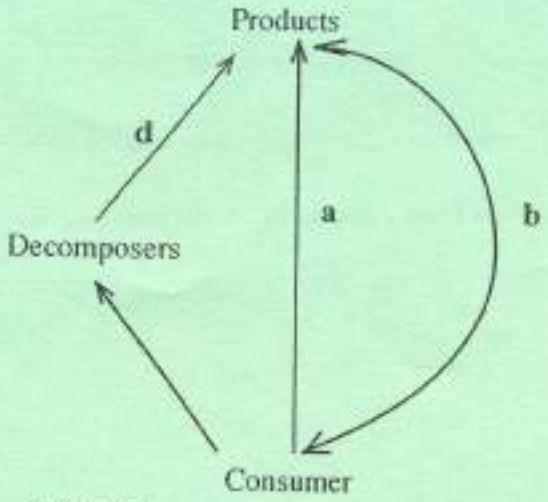

Figure 2.

(i) State the process represented by each of the arrow **a**, **b**, **c** and **d**. (4 marks)

(c) Explain the treatment given to plants before they are preserved in a herberium. (10 marks)