

1408/314
BIOLOGY TECHNIQUES
June/July 2010
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 in 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 3 printed pages.

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

SECTION A (60 marks)

Answer ALL the questions in this section.

1. Define the following types of pasteurization methods:
 - (a) flash; (2 marks)
 - (b) holder. (2 marks)

2. State the reason for carrying out each of the following techniques in a histology laboratory:
 - (a) staining; (1 mark)
 - (b) embedding; (1 mark)
 - (c) mounting; (1 mark)
 - (d) clearing. (1 mark)

3. Suggest any **four** reasons for handling of laboratory animals. (4 marks)

4. Distinguish between neutrophils and basophils in terms of morphology. (4 marks)

5. Define the following terms:
 - (a) population; (2 marks)
 - (b) nitrification. (2 marks)

6. Distinguish between enriched media and enrichment media. (4 marks)

7. State any **four** factors necessary for growth of micro-organisms. (4 marks)

8. State the function of the following substances in a living organism:
 - (a) amino acids; (1 mark)
 - (b) carbohydrates; (1 mark)
 - (c) fats; (1 mark)
 - (d) enzymes. (1 mark)

9. Draw a diagram representing the following stages in cell division:
 - (a) early anaphase; (2 marks)
 - (b) late anaphase. (2 marks)

10. Outline the biuret test. (4 marks)

11. Describe the preparation of a 3% acid alcohol. (4 marks)

12. (a) Define the term herbarium. (1 mark)
- (b) State any **three** methods of collecting plant specimens. (3 marks)
13. Define the following terms and give an example of each:
- (a) biotic factor; (2 marks)
- (b) abiotic factor. (2 marks)
14. Draw a labelled diagram of bacteriophage. (4 marks)
15. (a) Define the term "resolving power" as applied to microscopy. (2 marks)
- (b) Find the total magnification if the eye piece is x10, focal length is 4mm and working tube length is 160mm. (2 marks)

SECTION B (40 marks)

Answer any TWO questions from this section.

16. State the differences between mitosis and meiosis. (20 marks)
17. (a) State the characteristics of an ideal fixative. (7 marks)
- (b) Outline chemical test used to determine the end-point of decalcification. (13 marks)
18. (a) Explain the meaning of the following terms:
- (i) community; (2 marks)
- (ii) food chain; (2 marks)
- (iii) ecosystem. (3 marks)
- (b) Outline the steps followed in setting up an autoclave for sterilizing culture plates. (13 marks)
19. (a) Distinguish between light microscope and electron microscope. (10 marks)
- (b) Describe the care of microscope in the laboratory. (10 marks)