

1408/314
BIOLOGY TECHNIQUES
June/July 2009
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 questions in this section.

1. Differentiate between indirect staining and negative staining. (4 mark)
2. Describe how a paraffin block is attached to the holder of a microtome. (4 mark)
3. Explain how the use of oil immersion helps to increase magnification in light microscopy. (4 marks)
4. (a) Name the chemical commonly used in preserving specimens in museum jars. (1 mark)
(b) State:
(i) the risk involved during dissection of a specimen preserved in the above preservative. (1 mark)
(ii) precautions to be taken in b(i) above. (2 marks)
5. Describe the biuret test. (4 marks)
6. Explain the process of succession from a bare rock. (4 marks)
7. (a) Explain the concept of "survivorship curve". (2 marks)
(b) Name any **two** density dependent and **two** density independent factors limiting population growth. (2 marks)
8. State the function of each of the following cells:
(a) Neutrophils (1 mark)
(b) Basophils (1 mark)
(c) Platelets (1 mark)
(d) Erythrocytes (1 mark)
9. Draw a diagram to illustrate the working principle of dark field microscope. (4 marks)
10. Distinguish between competitive and non competitive enzyme inhibition. (4 marks)
11. Explain the effects of placing red blood cells in:
(a) hypotonic solution. (2 marks)
(b) hypertonic solution. (2 marks)
12. State any **four** different methods of mounting dried plant specimens on herbarium sheets. (4 marks)
13. (a) Define "aseptic technique". (2 marks)
(b) Name any **two** methods used to isolate pure cultures of microorganisms. (2 marks)

14. (a) Define the term Biological Oxygen Demand (BOD). (2 marks)
- (b) Explain the consequence of sudden phosphate and nitrate enrichment by sewage discharge. (2 marks)
15. By use of a diagram, illustrate how life motile microorganisms can be observed by use of a microscope. (4 marks)

SECTION B (40 MARKS)

Answer any two questions from this section.

16. Describe the various types of dosing and injection procedures which may be carried out in a rabbit. (20 marks)
17. Differentiate between mitosis and meiosis. (20 marks)
18. Outline the procedure of dissecting a rat. (20 marks)
19. Describe the carbon cycle. (20 marks)