

Name: _____ Index No: _____

1408/314
BIOLOGY TECHNIQUES
June/July 2012
Time: 3 hours

Candidate's Signature: _____

Date: _____



THE KENYA NATIONAL EXAMINATIONS COUNCIL
SCIENCE LABORATORY TECHNOLOGY CRAFT

BIOLOGY TECHNIQUES

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number on the spaces provided above.
Sign and write the date of examination on the spaces provided above.
You should have a scientific calculator (battery operated) for this examination.
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.

For Examiners Use Only

Section	Question	Maximum Marks	Candidate's Score
A	1-15	60	
B		20	
		20	
TOTAL			

This paper consists of 12 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. (a) State the functions of the following parts of an electron microscope:

(i) electron gun; (1 mark)

(ii) condenser. (1 mark)

(b) Draw a labelled diagram of a plant cell as seen under a light microscope. (2 marks)

2. Describe the sharpening of a microtome knife. (4 marks)

3. State any four features that distinguish a female drosophila from the male. (4 marks)

4. Distinguish metachromatic staining from progressive staining. (4 marks)

5. (a) State any two differences between mitosis in an animal cell and a plant cell. (2 marks)

(b) Explain the meaning of the following terms: (2 marks)

(i) phagocytosis;

(ii) plasmolysis.

6. List any **four** methods that can be used in preserving herbarium specimen. (4 marks)

7. (a) Identify the cells that make up the aveolar tissue. (2 marks)

(b) State the function of the vascular tissue. (2 marks)

8. State the function of the following equipment in ecological studies: (4 marks)

(i) Secchi disc;

(ii) Hygrometer;

(iii) Widger;

(iv) Pooter.

9. (a) Name any **four** groups of micro-organisms. (2 marks)

(b) Differentiate obligate from facultative anaerobes. (2 marks)

10. (a) State any **four** xerophytic adaptations. (2 marks)

(b) State the role of the following bacteria in nitrogen cycle: (2 marks)

(i) Nitrobacter;

(ii) Pseudomonas.

11. Describe a positive biuret test. (4 marks)

12. Describe the preparation of 100 ml of 0.1M potassium hydroxide solution. (4 marks)

13. List any **four** differences between DNA and RNA. (4 marks)

14. Explain the functions of each of the following leucocytes: (4 marks)

(i) Neutrophils;

(ii) Lymphocytes.

15. Outline the preparation of bones from carcass for museum. (4 marks)

SECTION B: (40 marks)

Answer any TWO questions from this section.

16. (a) Explain how parasitism may control population. (6 marks)
- (b) Distinguish intraspecific from interspecific competition. (4 marks)
- (c) Describe capture re-capture method of population sampling. (10 marks)
17. (a) Outline the procedure of using an autoclave to sterilize substance. (10 marks)
- (b) Explain how contrast and resolution can be increased in microscopy. (10 marks)
18. (a) (i) Define agglutination;
- (ii) Describe the basis of grouping human blood in the ABO group system. (12 marks)
- (b) (i) What is meant by a fixative?
- (ii) State any **four** precautions observed before fixation. (6 marks)
- (iii) Describe the preparation of 100 ml of formal sublimate. (2 marks)
19. (a) Discuss hamster with respect to:
- (i) sexing;
- (ii) breeding cycle;
- (iii) humane killing. (14 marks)
- (b) Outline the proper disposal of carcass after observation. (6 marks)