

1904/105
BIOLOGY TECHNIQUES I
June/July 2023
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
CRAFT CERTIFICATE IN SCIENCE LABORATORY TECHNOLOGY
MODULE I

BIOLOGY TECHNIQUES I

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Non programmable scientific calculator.

The paper consists of TWO sections; A and B.

Answer ALL questions in section A and any TWO questions from section B in the answer booklet provided.

Each question in section A carries 4 marks while each question in section B carries 20 marks.

Maximum marks for each part of a question are indicated.

Candidates should answer the questions in English.

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.

SECTION A (60 marks)

Answer ALL questions in this section.

1. (a) Describe the following cell organelles:
 - (i) ribosomes; (1 mark)
 - (ii) centrioles. (1 mark)
- (b) State the function of each of the cell organelle in (a). (2 marks)
2. State the function of each of the following parts of a light microscope:
 - (a) diaphragm; (1 mark)
 - (b) body tube; (1 mark)
 - (c) coarse adjustment knob; (1 mark)
 - (d) condenser. (1 mark)
3. State **four** properties of monosaccharides. (4 marks)
4. Highlight **four** factors that affect the process of active transport. (4 marks)
5. Outline **four** causes of the stationery phase in a bacterial growth curve. (4 marks)
6. Distinguish between the following terms:
 - (a) flaccidity and turgidity; (2 marks)
 - (b) phagocytosis and pinocytosis. (2 marks)
7. List **four** modes of asexual reproduction in microorganisms. (4 marks)
8. Identify **four** excretory products in plants. (4 marks)
9. Highlight **four** roles of saliva in digestive system. (4 marks)
10. Name the respiratory surfaces of the following animals:
 - (a) fish; (1 mark)
 - (b) insect; (1 mark)
 - (c) earthworm; (1 mark)
 - (d) bird. (1 mark)

11. Draw a cross section of an artery. (4 marks)
12. Highlight **four** functions of a kidney. (4 marks)
13. (a) Name the building block of a protein. (1 mark)
- (b) State **three** functions of a colon. (3 marks)
14. Illustrate each of the following types of bacteria:
- (a) coccus; (1 mark)
- (b) bacillus; (1 mark)
- (c) vibrio; (1 mark)
- (d) spirilla. (1 mark)
15. Draw a labelled diagram of a cell at metaphase in mitosis. (4 marks)

SECTION B (40 marks)

Answer any TWO questions from this section.

16. (a) Describe each of the following dry heat methods of sterilization:
- (i) incineration; (3 marks)
- (ii) flaming; (3 marks)
- (iii) hot air oven. (4 marks)
- (b) Describe how the following features are used in animal classification:
- (i) symmetry; (3 marks)
- (ii) skeleton; (2 marks)
- (iii) body cavity; (3 marks)
- (iv) germ layer. (2 marks)
17. (a) Outline the significance of mitosis. (4 marks)
- (b) Difference between mitosis and meiosis. (12 marks)
- (c) Explain **four** differences between afferent arterioles and efferent arterioles in the kidney. (4 marks)

18. (a) Explain what would happen if red blood cells are placed in:
- (i) strong salt solution; (4 marks)
 - (ii) distilled water. (4 marks)
- (b) Differentiate between external and internal fertilization. (6 marks)
- (c) Illustrate the following types of flowers in relation to ovary position:
- (i) epigynous flower; (2 marks)
 - (ii) hypogynous flower; (2 marks)
 - (iii) perigynous flower. (2 marks)
19. (a) Outline the procedure of smear preparation from a liquid media. (6 marks)
- (b) Explain **seven** differences between arteries and veins. (14 marks)

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