

1904/205
BIOLOGY TECHNIQUES II
June/July 2020
Time: 3 hours



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

BIOLOGY TECHNIQUES II

3 hours

INSTRUCTIONS TO CANDIDATES

This paper consists of TWO sections; A and B.

Answer ALL the 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 from this section.

1. Classify succulent fruits, giving specific examples in each case. (4 marks)
2. Name any **four** types of fruit ovules. (4 marks)
3. Illustrate the test-cross on a tall plant which is heterozygous. (4 marks)
4. Draw a labelled diagram of human spermatozoa as seen under an electron microscope. (4 marks)
5. Match the following organs with their origin in the gastrula.

Organ	Gastrula layer
(a) Kidneys	(i) Endoderm
(b) Stomach	(ii) Mesoderm
(c) Brain	(iii) Ectoderm
(d) Liver	

6. State any **four** functions of vertebrate skeleton. (4 marks)
7. Relate the structure of proximal convoluted tubules to its function. (4 marks)
8. Outline the procedure of opening the abdomen of a rat during dissection after skinning from the ventral side. (4 marks)
9. Suggest **four** methods of humane killing of laboratory rats. (4 marks)
10. Describe mounting of museum specimen in museum jars. (4 marks)
11. Name the tools and equipment required in herbarium specimen collection. (4 marks)
12. Match the following organisms with their suitable sampling technique.

Organism	Sampling method
(a) Caterpillars	(i) Pit fall trap
(b) Dandelion	(ii) Tree beating
(c) Frogs	(iii) Quadrat
(d) Beetle	(iv) Water net

(4 marks)

13. (a) Highlight **two** sources of errors during measurement of light intensity. (2 marks)
- (b) State the precaution to be taken against each source of error in (a). (2 marks)
14. Figure 1 shows a population growth curve.

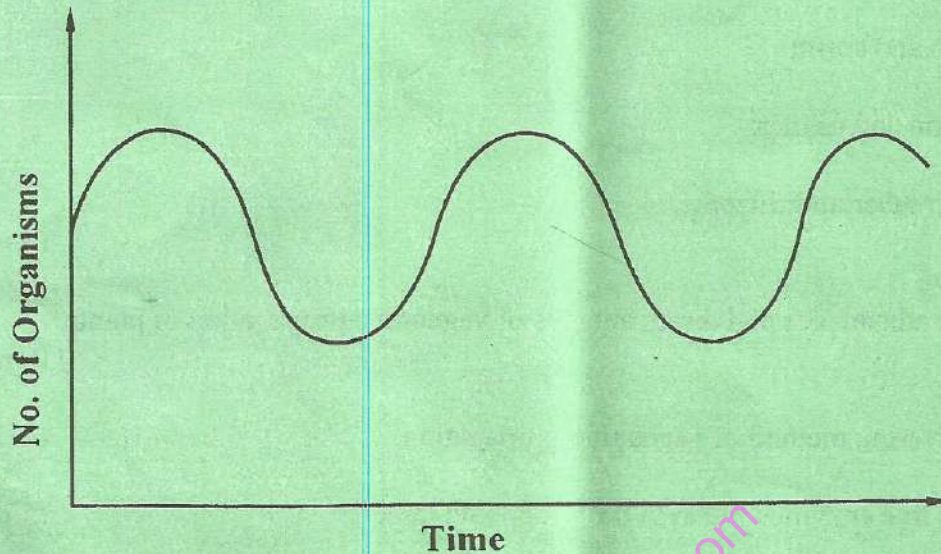


Fig. 1

- (a) Identify the type of population growth curve represented. (1 mark)
- (b) Name any **two** animals likely to show the population growth curve. (2 marks)
- (c) State the characteristic of the reproductive capacity of animals represented in figure 1. (1 mark)
15. (a) Name **two** denitrifying bacteria. (2 marks)
- (b) Explain the role of denitrifying bacteria in the nitrogen cycle. (2 marks)

SECTION B (40 marks)

Answer any TWO questions from this section.

16. (a) Distinguish between each of the following:
- (i) bulb and corm;
 - (ii) stolon and runner;
 - (iii) stem tuber and rhizome.
- (6 marks)
- (b) Explain the advantages and disadvantages of vegetative propagation in plants. (10 marks)
- (c) Describe layering method of vegetative propagation. (4 marks)
17. (a) (i) List **five** enzymes found in the pancreatic juice. (5 marks)
- (ii) State the functions of each of the enzymes in (i). (5 marks)
- (b) Relate the structure of ruminant stomach to its function. (10 marks)
18. Using specific examples, explain methods of reducing water loss as adaptation strategies for terrestrial organisms. (20 marks)
19. (a) Describe each of the following methods of animal specimen collection:
- (i) pitfall trap; (5 marks)
 - (ii) sticky trap. (5 marks)
- (b) Outline human foetus development up to the 4th week after fertilization. (10 marks)

THIS IS THE LAST PRINTED PAGE.