

1408/314
BIOLOGY TECHNIQUES
June/July 2018
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN SCIENCE LABORATORY TECHNOLOGY

BIOLOGY TECHNIQUES

3 hours

INSTRUCTIONS TO CANDIDATES

This 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 carried 20 marks.

Maximum marks for each part of the 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 the questions in this section.

1. (a) Name the monosaccharides that results from hydrolysis of sucrose. (2 marks)
- (b) State any two functions of pentoses. (2 marks)
2. Figure 1 represents the effect of substrate concentration on the rate of an enzyme controlled reaction of a given enzyme concentration.

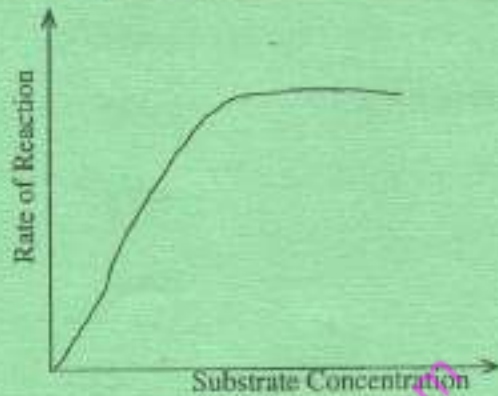


Fig. 1

Explain the shape of the curve. (4 marks)

3. (a) Distinguish between endocytosis and exocytosis. (1 mark)
- (b) Give specific examples of the functions carried out through exocytosis in living things. (3 marks)

4. (a) Describe the structure of golgi apparatus as viewed under an electron microscope. (2 marks)

(b) State the functions of the golgi apparatus. (2 marks)

5. (a) Define the term resolving power of a lense. (1 mark)

(b) Name any three types of light microscopes which may be used in a biology laboratory. (3 marks)

6. (a) Outline intravenous injection procedure in a rabbit. (2 marks)

(b) Describe disease preventive measures in rabbit cages. (2 marks)

1408/314

- cleaning the cage regularly

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for for



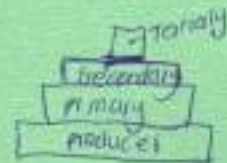
cell - inside the cell
cell - outside the cell
- Secretion

- packaging
- transportation of glycogen protein

2 molecular kinetostat

- in the vein where the ear of the rabbit is shaved and the

7. (a) Name any two aldehyde based fixatives used in a biology laboratory. (2 marks)
- (b) Give any one advantage and one disadvantage of mercurial fixatives. (2 marks)
8. Explain any four significance of mitosis in living things. (4 marks)
9. Outline the culturing of bacteria using a deep culture technique. (4 marks)
10. List the advantages of evaluating the productivity of an ecosystem by the use of the pyramid of energy. (4 marks)
11. Draw labelled diagrams of each of the following cells. (2 marks)
- (a) neutrophil (2 marks)
- (b) eosinophil
12. Draw the cross-sectional profile of any four named microtome knives. (4 marks)
13. Outline the embedding of tissues by use of leuckhart embedding box using paraffin wax. (4 marks)
14. Describe the pressing process in herbarium. *- The plant to be pressed is placed directly in the set in a manifold paper* (4 marks)
15. Haematoxylin stains are either regressive or progressive. Describe how each technique is performed. (4 marks)



SECTION B (40 marks)

Answer any TWO questions from this section.

16. (a) With the aid of a labelled diagram, explain the interspecific interaction of a predator-prey relationship. (10 marks)
- (b) Explain the effects of eutrophication on the receiving ecosystem and the problems to human societies associated with these effects. (10 marks)
17. (a) Describe the preparation of a nutrient agar, detailing the active ingredients and their uses. *- agar, yeast, peptone* (15 marks)
- (b) Explain sterilization by uses of radiation. (5 marks)

1408/314
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Grass → primary → secondary → tertiary
Grass → cow → cheetah → lion → vulture

(4) *- The plant is collected when it is fresh
 - it is then pinned when all the parts are well arranged.
 - The material is then well tapped when no air circulation is left.
 - It is then placed in a dark room overnight and can be observed in pressing is over.*

*- custom dress
 - water
 - agar*

- The plant is covered on the top

20+20 = 40%

18. (a) Explain the advantages and disadvantages of frozen sections/cryostat sections. (7 marks)
- (b) Outline the floating-out sections using a water bath. (13 marks)
19. (a) With the aid of a labelled diagram demonstrate the suitable arrangement of the apparatus for analysis of amino acids using paper chromatography. (8 marks)
- (b) Explain how proteins in an egg albumin are broken for the above (a) experiment. (5 marks)
- (c) Draw labelled different morphological shapes of bacteria. (7 marks)

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