

1408/314
BIOLOGY TECHNIQUES
June/July 2017
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 in the answer booklet provided.

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 pages are missing.

SECTION A (60 marks)

Answer ALL the questions in this section.

1. State the function(s) of each of the following parts of a compound microscope:
 - (a) draw tube; → used to draw the scale of the specimen. (1 mark)
 - (b) aperture adjustment; → used to adjust the objective. (1 mark)
 - (c) mechanical stage; → the specimen is put in the stage for examination. (1 mark)
 - (d) objective. → used to focus for easy observation. (1 mark)
2. Distinguish between rough endoplasmic and small endoplasmic reticulum. (4 marks)
3. Describe the purpose of subjecting tissues through fixation process. → for easy immersion of smooth (4 marks)
4. (a) Name any two types of pentoses found in animals. → Calcium Phosphorus (1 mark)
(b) Give any three functions of pentoses in living things. → stop the enzymatic activity of cell. (3 marks)
5. Explain how the shape of an enzyme is related to its functions. → stop the activity of cell. (4 marks)
6. (a) List the functions of the following bacterial structures:
 - (i) capsule; → protect the internal organs of damage. (1 mark)
 - (ii) cell wall. → give the bacterial its shape. (1 mark)
- (b) Classify bacteria according to the mode of production of energy for their metabolism. (2 marks)
7. Explain the differential characteristics of the following agar media:
 - (a) blood agar; → it is enriched with blood. (2 marks)
 - (b) MacConkey agar. used for differentiation of agar. (2 marks)
8. (a) Outline the three general steps through which antigen-antibody reactions occur. (3 marks)
- (b) Name any two types of antigen-antibody reactions. (1 mark)
9. State the methods used in mice euthanasia during laboratory dissection. (4 marks)
10. Outline the procedure of using a 100% formalin as a fluid preservative for museum specimen. (4 marks)

Not sure.
Calcium
phosphorus



11. Identify the use of the following equipment in ecological studies:

- (a) quadrat; → ^{used in} population estimation.
- (b) geographical; → + is the features of environment of population.
- (c) Secchi disc; → characteristics
- (d) barometer. → for measuring humidity

(4 marks)

12. Outline the collection of specimen in herbarium techniques.

(4 marks)

13. List the effects of the following environmental phenomena:

- (a) greenhouse effect; → The environmental should be favourable and maintain that of natural for food production →
- (b) acid rain; → acidify the soil raise the pH of the soil
- (c) ozone depletion; → melting it
- (d) photochemical smog. → causes the formation of acid. (4 marks)

14. Describe the two types of surface soil erosion.

- Corley soil erosion
- Willy soil erosion
- It cause the formation of chemical which cause has infection on skin. (4 marks)

15. List any four characteristics of an ideal mounting media in histological techniques.

- Should not be air bulb free. (4 marks)
- Should be clear.
- Should not be retract setting.
- Should be quickly.

SECTION B (40 marks)

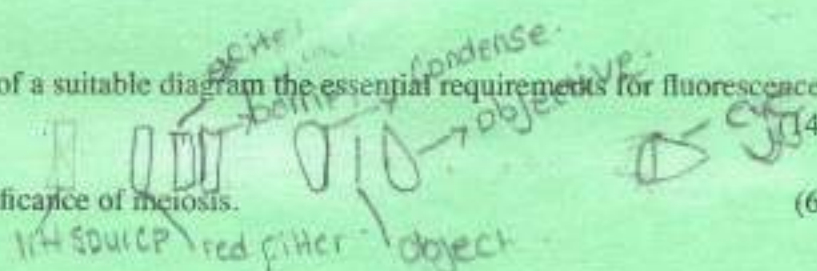
Answer any TWO questions from this section.

16. (a) Describe:

- (i) four biological activities in which osmosis plays an important role. (8 marks)
- (ii) endocytosis. (8 marks)

(b) Explain cell inclusions giving specific examples. (4 marks)

17. (a) Illustrate by use of a suitable diagram the essential requirements for fluorescence microscopy.



(14 marks)

(b) Explain the significance of meiosis. (6 marks)

18. (a) Describe the sharpening of microtome knives. → honing ✓ (12 marks)

(b) Outline the procedure for preparing a wet mount in slide preparation. (8 marks)



Massive

Tydemergal

Premature

19. (a) Discuss dry heat sterilization as used in microbiology and indicators to assure quality in sterilization. (16 marks)
- (b) Distinguish between the physical properties of monosaccharides from those of polysaccharides. (4 marks)

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