

SCAN

Name: \_\_\_\_\_

Index No: \_\_\_\_\_ / \_\_\_\_\_

1408/314  
BIOLOGY TECHNIQUES  
June/July 2015  
Time: 3 hours

Candidate's Signature: \_\_\_\_\_

Date: \_\_\_\_\_



THE KENYA NATIONAL EXAMINATIONS COUNCIL  
CRAFT CERTIFICATE IN SCIENCE LABORATORY TECHNOLOGY

BIOLOGY TECHNIQUES  
3 hours



INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.  
Sign and write the date of the examination in 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** questions in Section **A** and **TWO** questions from Section **B** in the spaces provided in this question paper.  
Maximum marks for each part of a question are indicated.  
Do **NOT** remove any page from this question paper.  
Candidates should answer the questions in English.

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A	1 - 15	60	
B		20	
		20	
Total Score		100	

This paper consists of 16 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 in the spaces provided.

1. State **four** factors that must be taken into consideration to get the maximum amount of resolution from a lens system of a compound microscope. (4 marks)

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2. (a) Name any **four** tissue isolation techniques used in histological laboratory. (2 marks)

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- (b) List the information necessary on the label of a permanent slide prepared in a laboratory. (2 marks)

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3. Explain how each of the following factors will affect fixation process of tissues: (4 marks)

(a) penetration;

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(b) the volume of fixative.

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4. Figure 1, is a micrograph showing two plant cells A and B, which are adjacent to one another.

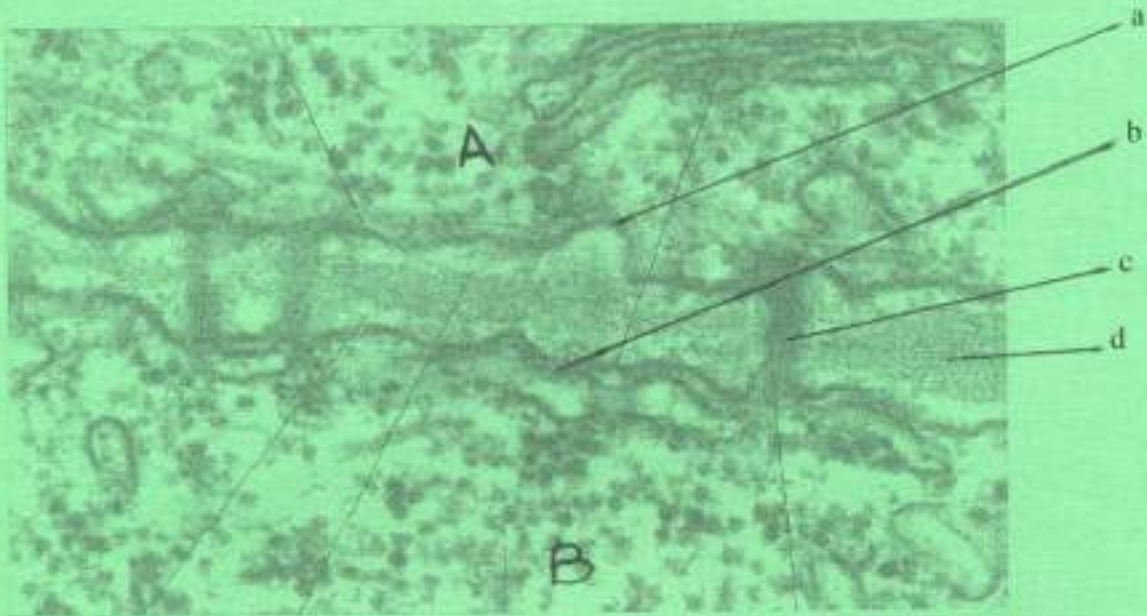


Fig. 1

Identify the parts labelled a, b, c and d.

(4 marks)

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(17)

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5. Outline each of the following tests:

(a) Biuret test;

(2 marks)

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(b) Benedict's test.

(2 marks)

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6. (a) Explain why intracellular enzymes are more difficult to isolate than extracellular enzymes. (2 marks)

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(b) Outline the procedure for extraction of intracellular enzymes from a soaked bean. (2 marks)

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7. (a) Name any **four** physical sterilants. (2 marks)

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(b) Identify the types of materials sterilized by each of the sterilants in (a) above. (2 marks)

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8. Explain each of the following techniques of inoculation of culture media.

(a) pouring. (2 marks)

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(b) spreading. (2 marks)

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9. Differentiate between a selective media and differential media. Give specific examples from a rabbit. (4 marks)

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10. Describe how a 5 ml blood can be collected from a rabbit. (4 marks)

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11. Figure 2 shows some internal organs in a display of a dissected frog.

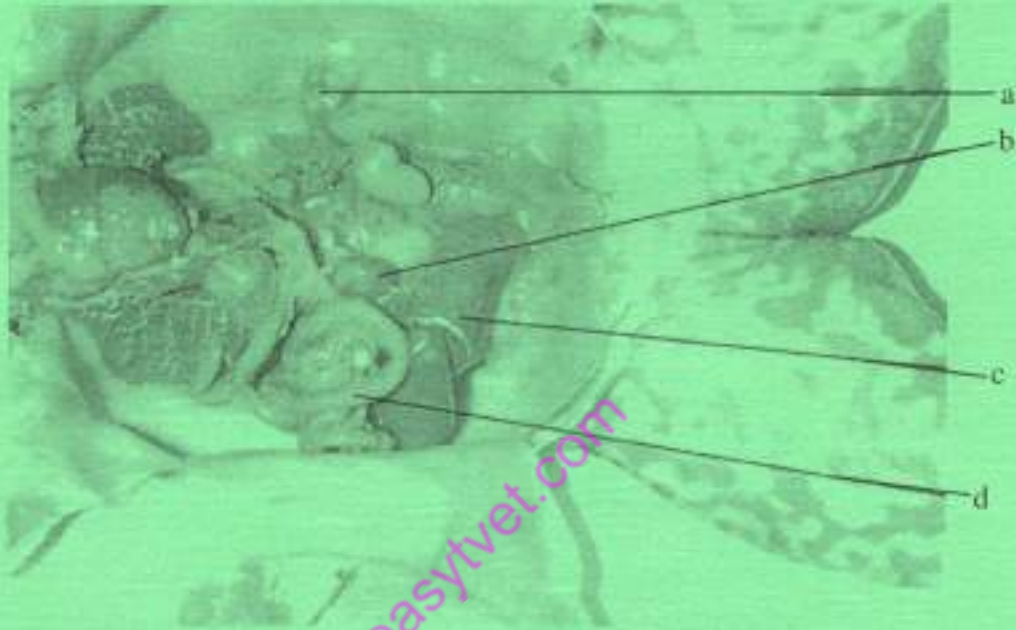


Fig.2

Identify parts labelled a, b, c and d. (4 marks)

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15. Figure 3, shows the diagram of a mitochondrion.

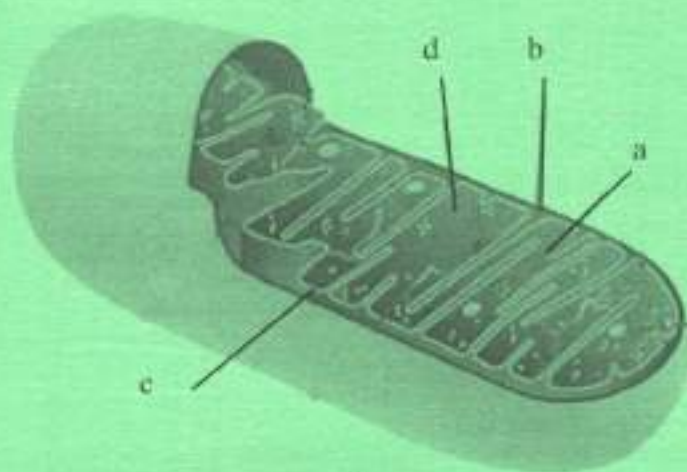


Fig. 3

Identify parts labelled a, b, c and d.

(4 marks)

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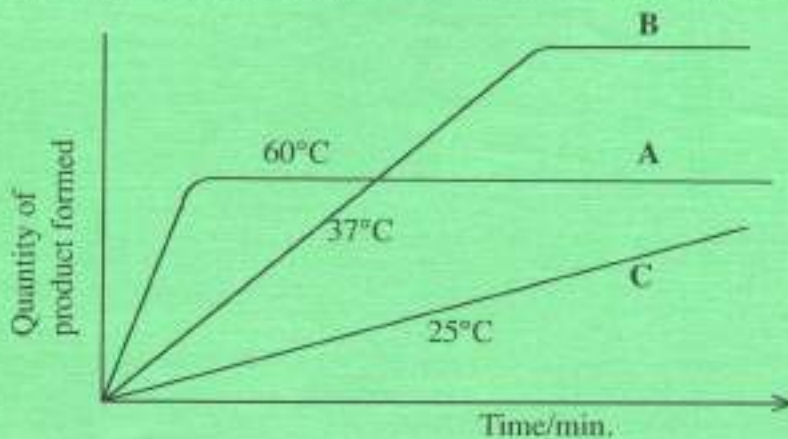
**SECTION B (40 marks)**

Answer any **THREE** questions from this section in the spaces provided after question 19.

16. (a) Compare and contrast, facilitated diffusion and active transport. (5 marks)

(b) Explain the functioning of sodium-potassium pump. (6 marks)

(c) Figure 4 shows the rate of enzyme reactions at different temperatures.



Comment on the shapes of the curves.

(9 marks)



17. (a) For each of the following blood cells, draw a labelled diagram of its shape and state the function of each cell.
- |                     |                  |
|---------------------|------------------|
| (i) red blood cells | (ii) neutrophils |
| (iii) eosinophils   | (iv) basophils   |
| (v) monocytes       | (vi) lymphocytes |
- (12 marks)
- (b) Explain the factors affecting the measurement of antigen-antibody reaction in agglutination reactions. (8 marks)
18. Discuss the handling and maintenance of processed herbarium collections in storage. (20 marks)
19. (a) Explain the effects of light as an abiotic factor in ecology. (10 marks)
- (b) (i) Define the term "soil conservation";
- (ii) Explain any **three** methods of soil conservation used in farming practices. (10 marks)

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