



231/3 –

**BIOLOGY**  
**(PRACTICAL)**

– Paper 3

**Nov. 2017 – 1¾ hours**

Name ..... Index Number .....

Candidate's Signature ..... Date .....

**Instructions to candidates**

- (a) Write your name and index number in the spaces provided above.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) Answer **all** the questions in the spaces provided.
- (d) You are required to spend the first 15 minutes of the 1¾ hours allowed for this paper reading the whole paper carefully before commencing your work.
- (e) Additional pages must **not** be inserted.
- (f) **This paper consists of 7 printed pages.**
- (g) **Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**
- (h) **Candidates should answer all the questions in English.**

**For Examiner's Use Only**

Question	Maximum Score	Candidate's Score
1	13	
2	14	
3	13	
<b>Total Score</b>	<b>40</b>	



1. You are provided with the following materials and reagents.

A straight portion of raw banana, labelled D

Two petri dishes

A scalpel/sharp razor blade

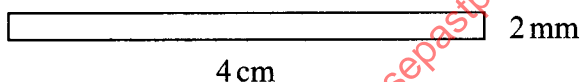
Two beakers containing liquids, E and F

A measuring cylinder

A stopwatch/access to a wall clock

Means of labelling.

- (i) Label the two petri dishes, E and F
- (ii) Place 30 cm<sup>3</sup> of liquid E into petri dish E and 30 cm<sup>3</sup> of liquid F into petri dish F
- (iii) Using the scalpel, prepare four thin, straight, flat strips from the raw banana peel
- (iv) Each strip should measure about 4 cm by 2 mm as illustrated below.



**Note:** To get a straight, flat, thin strip, remove all the banana flesh, leaving only the peel.

- (v) Immerse two strips in petri dish E and the other two in petri dish F and leave the set ups undisturbed for 10 minutes.
- (a) (i) State your observations in petri dishes E and F after 10 minutes.

Petri dish E (1 mark)

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Petri dish F (1 mark)

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(ii) Account for the observations made in (a) (i) on page 2.

Petri dish E (3 marks)

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Petri dish F (2 marks)

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(b) Describe the nature of liquids E and F in relation to the sap in the banana peel used in the experiment.

E (1 mark)

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F (1 mark)

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(c) With reference to the observations made, compare the nature of the outer and inner surfaces of the banana peel. (1 mark)

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- (d) (i) Name the cell structure responsible for the observations made in this experiment. (1 mark)

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- (ii) Explain how the cell structure named in (d) (i) above works to bring about the observations made. (2 marks)

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2. You are provided with the following materials and reagents.

Three test tubes on a rack

Dilute egg albumen

(Access to) dilute hydrochloric acid with a dropper

(Access to) Sodium hydroxide solution with a dropper

Solution P

Two droppers

Three 10 ml measuring cylinders

A stop watch/access to a wall clock

Access to a water bath maintained at 50 °C to 60 °C

- (i) Label the test tubes A, B, and C
- (ii) Put 2 cm<sup>3</sup> of egg albumen into each of the test tubes A, B and C
- (iii) Add 1cm<sup>3</sup> of solution P in each of the test tubes
- (iv) Into test tube A, add two drops of sodium hydroxide
- (v) Into test tube B, add two drops of hydrochloric acid
- (vi) Into test tube C, add 2 drops of water
- (vii) Place all the three test tubes in the water bath for 10 minutes.

- (a) (i) State the observations made in test tubes A and B.

Test tube A (1 mark)

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Test tube B (1 mark)

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(ii) Account for the observations made in a (i) above.

Test tube A

(3 marks)

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Test tube B

(3 marks)

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(b) Explain why the investigation was carried out at the specified temperature range.

(1 mark)

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(d) State the purpose of test tube C.

(1 mark)

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(e) (i) With a reason, identify solution P.

(2 marks)

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.....

(ii) Name the likely part of the human alimentary canal where the process in this experiment occurs.

(1 mark)

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(iii) Give a reason for your answer in e (ii) above.

(1 mark)

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3. You are provided with specimens labelled H and K. Specimen H is a complete plant while J is a portion of a different plant. Observe the specimens and answer the questions that follow.

(a) State **three** observable differences between the leaves of specimens H and K. (3 marks)

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(b) (i) Explain **three** ways in which the stem of specimen H adapts the plant for maximum photosynthesis. (3 marks)

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(ii) Explain **three** ways in which the plant from which specimen K was obtained is adapted for survival in its habitat. (3 marks)

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(c) Explain the consequence of adding liquid F used in question 1 to the soil in which specimen H is growing. (2 marks)

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(d) State **two** ecological importance of specimen K in an ecosystem. (2 marks)

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