

### 3.5.3 Biology Paper 3 (231/3)

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

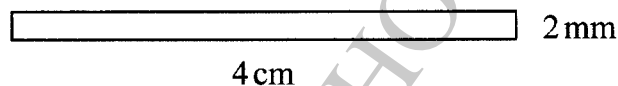
Two beakers containing liquids, E and F

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)
Petri dish F	(1 mark)
- (ii) Account for the observations made in (a) (i) on page 2.

Petri dish E	(3 marks)
Petri dish F	(2 marks)
- (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)
F	(1 mark)
- (c) With reference to the observations made, compare the nature of the outer and inner surfaces of the banana peel. (1 mark)

- (d) (i) Name the cell structure responsible for the observations made in this experiment. (1 mark)
- (ii) Explain how the cell structure named in (d) (i) above works to bring about the observations made. (2 marks)

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)
- Test tube B (1 mark)
- (ii) Account for the observations made in a (i) above.
- Test tube A (3 marks)
- Test tube B (3 marks)
- (b) Explain why the investigation was carried out at the specified temperature range. (1 mark)
- (d) State the purpose of test tube C. (1 mark)
- (e) (i) With a reason, identify solution P. (2 marks)
- (ii) Name the likely part of the human alimentary canal where the process in this experiment occurs. (1 mark)
- (iii) Give a reason for your answer in e (ii) above. (1 mark)



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)
  - (b) (i) Explain **three** ways in which the stem of specimen H adapts the plant for maximum photosynthesis. (3 marks)
  - (ii) Explain **three** ways in which the plant from which specimen K was obtained is adapted for survival in its habitat. (3 marks)
  - (c) Explain the consequence of adding liquid F used in question 1 to the soil in which specimen H is growing. (2 marks)
  - (d) State **two** ecological importance of specimen K in an ecosystem. (2 marks)

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