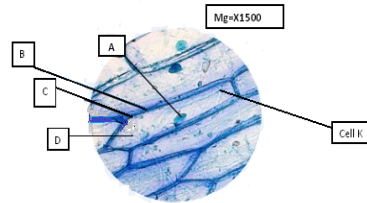


KASSU 2021 BIOLOGY PAPER 3 MARKING SCHEME

1. You are provided with the photomicrograph of an onion outer epidermis as seen under light microscope



a) On the photograph, name parts labelled A, C, and D
(3marks)

A *chloroplast* ;
C *cell membrane* ;
D *cytoplasm* ;

a) Explain how the part labelled B is adapted to its function (2marks)

Cell wall contain the polysaccharide cellulose; that give mechanical support

b) Calculate the actual size of the cell marked K, give your answer in micrometres
(2marks)

$$\begin{aligned} Mg &= \frac{\text{image size}}{\text{Actual size}} \\ 1500 &= \frac{4.4 \times 10,000}{\text{Actual size}} \\ &= \frac{44000}{1500} \\ &= 29.3 \mu\text{m} ; \text{units} \end{aligned}$$

c) The differences between the cells in the photograph and those obtained from an animal epithelial cells
(3marks)

Onion epidermal cells	Animal epithelial cells
<i>Cell wall present</i>	<i>Cell wall absent ;</i>
<i>Chloroplast present</i>	<i>Chloroplast absent ;</i>
<i>Nucleus located at the periphery</i>	<i>Centralised nucleus ;</i>





d) State the process that make the structures in the cell above appear more distinct (1mark)

Staining ;

e) In microscopic procedure in 1 (e) above name what was used to achieve the process
(1mark)

Iodine stain;;methylene blue ;eosin accept any one

2. The photographs below represent specimen labeled A, B, C and D

SPECIMEN A	SPECIMEN B
	
SPECIMEN C	SPECIMEN D
	

i) Name the type of placentation shown in specimen A and B (2 marks)

A Axile;

B free central;

ii) Identify the type of sections from which specimen C and D was obtained? (2 marks)

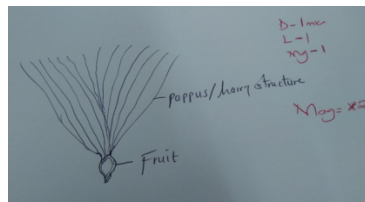
C cross section/transverse section;

D. Longitudinal section;

iii) Classify the above specimen labeled D (1mark)

Succulent;

iv) You are provided with specimen labeled D1, D2, D3 and D4. Examine them Draw and label specimen labeled D2 (3marks)



v) Giving a reason and state the agent of dispersal of the specimen (6marks)

Specimen	Agent of dispersal	Reason
D1	<i>Animal ;</i>	<i>Have hook-like structures which stick on fur/clothes of passing animals;</i>
D3	<i>Wind;</i>	<i>Has wing like structures to increase surface area for it to be carried by wind;</i>

D4	<i>Animal ;</i>	<i>Brightly coloured, succulent to attract animals that feed on it;</i>
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3. You are provided with the following. Solution P, Q and Z.

- (a) (i) Put 2 cm³ of solution P into two test tubes labeled A and B. Add iodine solution drops into test tube A. Observe and record. **(1 mark)**

Blue-black colour observed;

- (ii) To test tube B, add an equal amount of Benedict's solution. Heat to boil. Record your observation. **(1 mark)**

Blue-black of Benedict's solution persist;

- (iii) From the results in (a) (i) and (ii), Identify solution P. **(1 mark)**

Starch solution;

- (iv) put 2cm³ of solution Z into a clean test tube labelled C. Add equal volume of Benedicts solution. Heat to boil. **(1 mark)**

Blue colour of Benedict's solution persist;

- (v) Open the visking tubing provided. Pour solution P into the visking tubing and add 1cm³ of the solution R. Tie the visking tubing and ensure there is no leakage. Pour solution Z into a clean beaker till it is half full. Immerse visking tube in the solution Z in the beaker. Allow it to stand for 30 minutes. After 30 minutes, take 2cm³ of solution Z from the beaker into a clean test tube labelled D. Add equal amount of Benedict's solution. Heat to boil. Record your observation. **(1 mark)**

Colour changes from Blue-green- yellow- orange;

- (vi) Account for the observation made in (v) above. **(3 marks)**

Starch is hydrolysed into maltose by enzyme diastase; maltose molecules are small enough to diffuse through the small pores of the visking tubing; maltose reacted with Benedict's solution producing an orange colour;

- (b) (i) Pour 2 cm³ of solution Q into a clean test tube. Observe and record the color of solution Q. **(1 mark)**

White/turbid/ cloudy;

- (ii) Add 1 cm³ of sodium hydroxide into test tube containing solution Q. Record your observation. **(1 mark)**

Solution Q clears/ white colour fades off;

- (iii) Explain the results observed in (b)(ii) above. **(2 marks)**

Sodium Hydroxide breaks down the protein molecules into peptides; peptides form a clear solution;

- iv). what is the identity of solution R? **(1 mark)**

Enzyme/diastase

- v) State **one** factor that can affect the process demonstrated in 3a (v) above **(1 mark)**

Increase in temperature