***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 ;***

1. Explain how the part **labelled B** is adapted to its function **(2marks)**

***Cell wall contain the polysaccharide cellulose; that give mechanical support***

1. Calculate the actual size of the cell **marked K**, give your answer in micrometres

**(2marks)**

**Mg =** ***image size***

 ***Actual size***

*1500=* ***4.4×10,000 ;***

 ***Actual size***

 *=44000*

 *1500*

 *=29.3um ; units*

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

|  |  |
| --- | --- |
| Onion epidermal cells | Animal epithelial cells |
| *Cell wall present* | *Cell wall absent ;* |
| *Chloroplast present*  | *Chloroplast absent ;* |
| *Nucleus located at the periphery*  | *Centralised nucleus ;* |

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

*Staining ;*

1. 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** |
| Tamarillo Stock Video Footage - 4K and HD Video Clips | Shutterstock | Apple cross-section isolated on white background Royalty Free Stock Images  | Apple, Apple photo, Fruit |
| **SPECIMEN C** | **SPECIMEN D** |
| Passion Fruit Free Stock Photo - Public Domain Pictures | https://i.pinimg.com/564x/6c/82/a3/6c82a3870159bd5df74da76f96870161.jpg |

1. Name the type of placentation shown in specimen A and B **(2 marks)**

***A Axile;***

*B* ***free central;***

1. Identify the type of sections from which specimen **C** and D was obtained?

 **(2 marks)**

***C******cross section/transverse section;***

1. ***Longitudinal section;***
2. Classify the above specimen labeled D  **(1mark)**

***Succulent;***

1. You are provided with specimen labeled **D1, D2, D3** and **D4**. Examine them

Draw and label specimen labeled **D2** **(3marks)**



1. Giving a reason and state the agent of dispersal of the specimen **(6marks)**

|  |  |  |
| --- | --- | --- |
| **Specimen**  | **Agent of dispersal**  | **Reason**  |
| D1 | ***Animal ;*** | ***Have hook-like structures which stick on fur/clothes of passing animals;*** |
| D3 | ***Wind;*** | ***Has wing like structures to increase surface area for it to be carried by wind;*** |
| D4 | ***Animal ;*** | ***Brightly coloured, succulent to attract animals that feed on it;*** |

3. You are provided with the following. Solution P, Q and Z.

1. (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;***

1. (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***