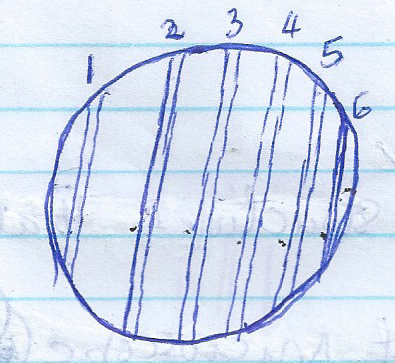
END OF TERM 2 2019

FORM 4 BIOLOGY

231/2

NAME:………………………………………………ADM NO:…………………..CLASS:……………

1. The diagram below shows a microscope focused on a millimeter scale of a glass ruler

(i) How many millimeters fit in the microscope field of view? (1mk)

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(ii) Work out the radius of the field of view in micrometers (2mks)

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(iii) Work out the area of the field of view in millimeters squared. (2mks)

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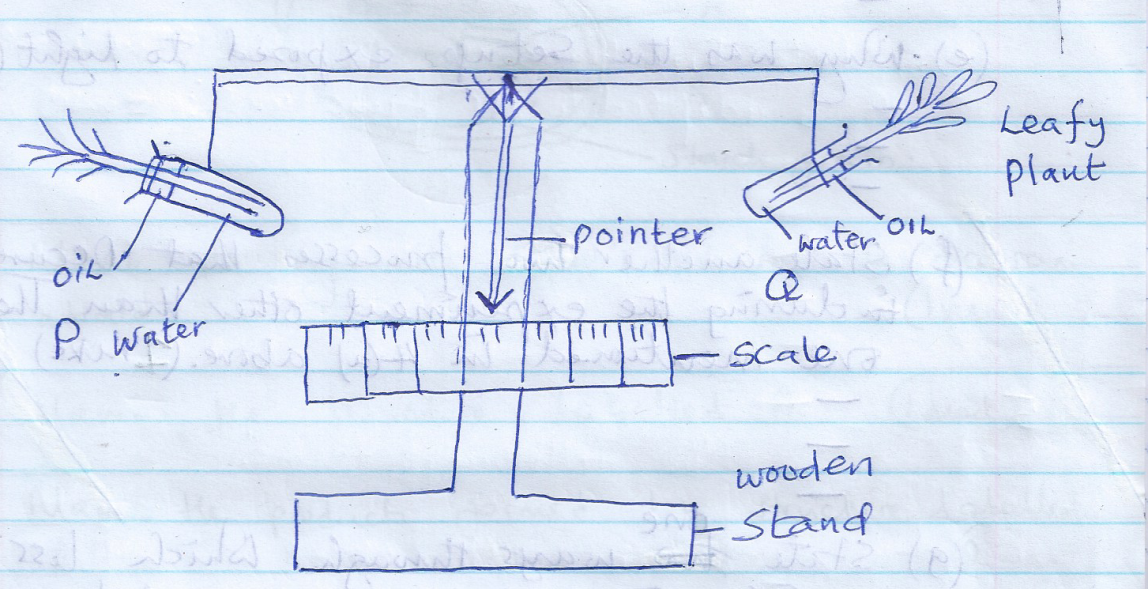
(iv) When onion epidermal cells well placed under the field of view, 10 cells were counted along the length of the field of view. Calculate the length of each epidermal cell (3mks)

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1. The setup below was used by students to investigate a certain phenomenon in plants.



The setup was exposed to light for one hour.

(a) What was being investigated (1mk)

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(b) What was the purpose of test tube p in the experiment? (1mk)

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(c) What was the role of the oil in the experiment? (1mk)

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(d) State two changes that are likely to have occurred after one hour. (2mks)

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(e) Why was the set up exposed to light (1mk)

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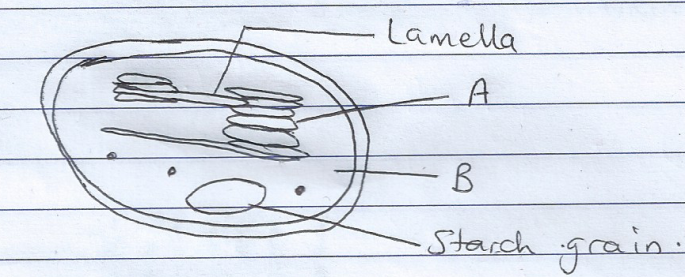
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(f) State another process that occurred during the experiment other than the one mentioned in 4(a) above. (1mk)

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(g) State one way through which loss of weight in test tube Q could be reduced/ minimized. (1mk)

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1. The following diagram represents an organelle found in plant cells.

(a) Name the organelle represented by the diagram. (1mk)

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(b) Name the structure labeled A (1mk)

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(c) Name the products formed by structure labeled A (2mks)

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(d) Name the substance labeled B (1mk)

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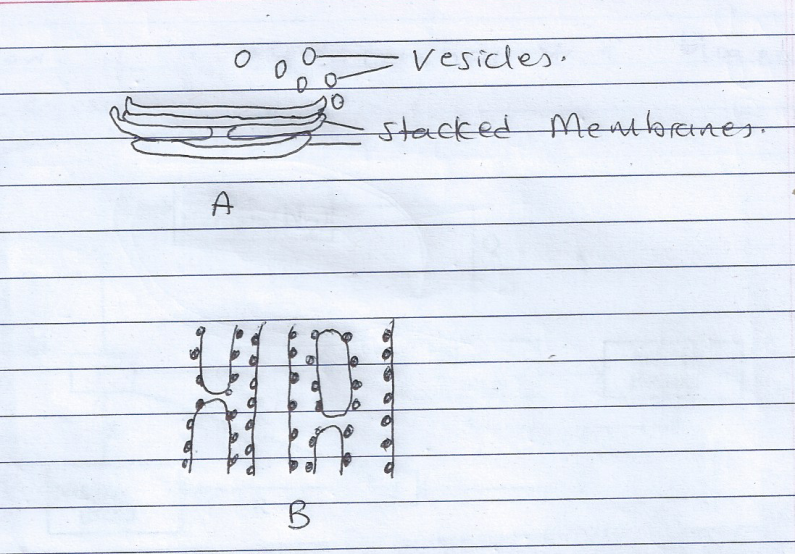
(e) How is the structure represented in the diagram above adapted to its function? (3mks)

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1. The figure below show cell organelles. Observe them keenly



(a) Identify organelle A and B (2mks)

A:...........................................................................................................................................

B:............................................................................................................................................

(b) State two functions of organelle A (2mks)

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(c) What is the function of organelle B (1mk)

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(d) Why is organelle A usually close to organelle B? (1mk)

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(e) Name the organelle that (2mks)

(i) Manufactures energy in the cell

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(ii) Controls all the cell activities

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1. Below is a representation of a biogeochemical cycle.

Free Nitrogen (N2)

P

Nitrates (NO2)

Plant protein

Animal protein

B

T

Q

U

Z

R

(a) Name the above cycle. (1mk)

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(b) What is B and P (2mks)

B..................................................................................................................................................

P.................................................................................................................................................

(c) Name the micro-organisms labeled T and R. (2mks)

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(d) Name process U and Z. (2mks)

U.................................................................................................................................................

Z..................................................................................................................................................

(e) Give specific name of free living bacteria. (1mk)

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1. The table below shows how quantities of sweat and urine vary with external temperatures

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| --- | --- | --- |
| External temperature (0c) | Urine cm3/h | Sweat cm3/h |
| 0  5  10  15  20  25  30  35 | 100  90  80  70  60  50  40  30 | 5  6  10  20  30  60  120  200 |

(a) Using the same axes, draw a graph of quantity of urine and sweat against the external temperature. (7mks)

(b)

(i) State the quantity of urine and sweat produced when external temperature was 12.50c. (2mks)

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(ii) State the physical process through which the body was cooled by sweating as temperature was rising. (1mk)

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(iii) Account for the quantity of urine produced as the temperature increased. (4mks)

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(c) State three nitrogenous wastes that could be eliminated in urine or sweat in human beings. (3mks)

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(d) State three behavioral mechanism that poikilotherms use to regulate their body temperature under hot conditions. (3mks)

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1. Describe how mammalian heart is adapted to its functions. (20 mks)

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1. (a) State four characteristics of respiratory surfaces. (4mks)

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(b) Describe the mechanisms of inhalation exhalation in mammals. (16mks)

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