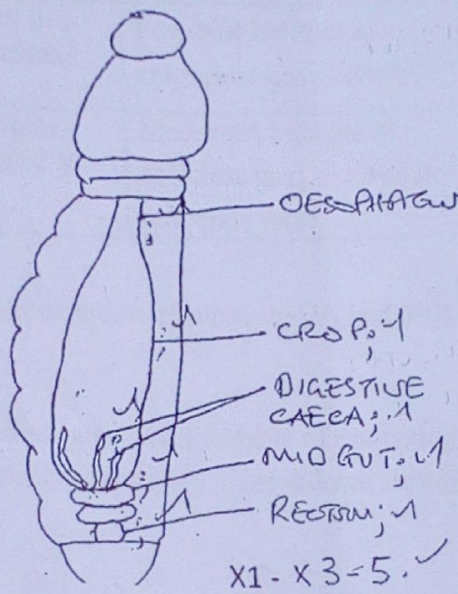
Drawing showing the ventral cuticle and undisplaced visceral internal parts of the digestive system of specimen K.

DRAWING SHOWING UNDISPLACED PARTS OF DIGESTIVE SYSTEM IN SPECIMEN K/COCKROACH; X

No. A
- If thorax dissected ..parts labeled
- if digestive system displaced beyond outline
- if any external part labelled

Dorsal cuticle drawn

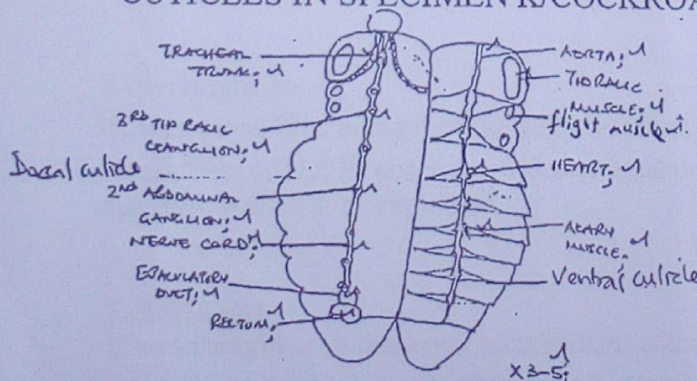
D =02½
L =02½
M =01
T =01
N =01
O =01
A =01-(Abdomen dissected
UD =01-(undisplaced parts)
10MAX



X1 - X3 = 5.

(ii) Proceed to dissect and expose the complete Alimentary canal and displace it to the left of the specimen to display the internal structures.

DRAWING SHOWING INTERNAL STRUCTURES WHICH ARE ATTACHED TO CUTICLES IN SPECIMEN K/COCKROACH.



X3-5;1
X1 - X3

D = 05
L = 05
M = 01
T = 01
N = 01
LO = 01
DA = 01 (Dorsal cuticle displaced to right side of specimen)
15

If A/canal, salivary apparatus mushroom shaped gland drawn and labelled.
15

TOTAL = 40MARKS

Question 2

EXPERIMENT	OBSERVATIONS	DEDUCTIONS
1- To half of W in a tube, add $2cm^3$ of V_1	Many; bubbles of colourless gas; evolved at fast rate;	Fast; breakdown of V_1;
2- To remaining half of W in a tube, add $2cm^3$ of V_2	Very many; bubbles of colourless gas; evolved at very fast rate;	Very fast; breakdown of V_2;
3- Repeat procedure in 1 above using X instead of W	Few/No; bubbles of colourless gas evolved;	Slow/no; breakdown of V_1;
4- Repeat procedure in 1 above using half of Y instead of W	Moderate; bubbles of colorless gas; evolved at moderate rate;	Moderate; breakdown of V_1;

(ii)

Effect of varied concentration of substrate (V_1 and V_2); on rate of breakdown of the substrate;

(01mark)

W contained an active substance; capable of catalyzing breakdown of complex substrate V_1 and V_2; V_1 of lower concentration is breakdown slowly; while V_2 of higher concentration at faster rate;

04

(iii)

Experiment 1:

-W which was flight muscle being metabolically very active; has high concentration of the active substances; which catalyses breakdown of substrate V_1; at fast rate;

02
Max.

Experiment 3:

-X was mandibles being metabolically inactive; had no active substances; thus there was no breakdown of V_1; /if observation shows breakdown, it's due to the muscle attachment on the mandibles-mark it as explained.

02
Max

Experiment 4:

Y was foregut with moderate metabolism; contained moderate concentration of the active substances; thus V1 was broken-down; at moderate rate;

02
Max
06

EXPERIMENTS	OBSERVATIONS
To boiled foregut add $2cm^3$ of V_2	No bubbles of colourless gas evolved;
To heated substance Z add $2cm^3$ of V_2	Many/very many;bubbles;evolved at fast rate; with release of heat;

NB: accept effervescence for bubbles, but correctly spelt. **03**

(i) Z is an inorganic active substance; since it's not affected by excessive heat;

(ii) Boiling foregut denatures the active substance; so complex substrate V2 is not Brocken down; while excessive heat has no effect on substance Z; so it catalyses breakdown of substrate V2 at fast rate; 02 04

TOTAL = 30MARKS

Question 3

(a) (i) Specimen S

Many; thin; long; cylindrical; green coloured; filament; which are flexible; and buoyant;

Any 6 point @ ½ mark
Max 03marks

(ii) the internal structure of specimen T (03 marks)

-Numerous; layers; of thick; fleshly/succent leaves; which taper towards apex and base; fleshy leaves curve inwards; and reduce in size towards inner side; there are buds at Centre; and the fleshy leaves are closely packed;

Any 6 point @ ½ mark
Max 03marks

b(i) Differences:

Cells from S	Cells from T
1-Rectangular/4 sided ;	Hexagonal/6 sided
2-Chloroplast/pyrenoids present;	Chloroplast/pyrenoids absent
3-Large central vacuole ;	Smaller vaccule
4-Fewer cells;	many cells
5-Uniform size of cells;	varied size of cells

Candidates should compare a feature
Show comparison
Any 3 @ 1 mark

Similarities: Both have: - (03 marks)

1-double layered cell wall ; cells in contact with each other;
2-single vacuole ;
3-regular shaped cells ;

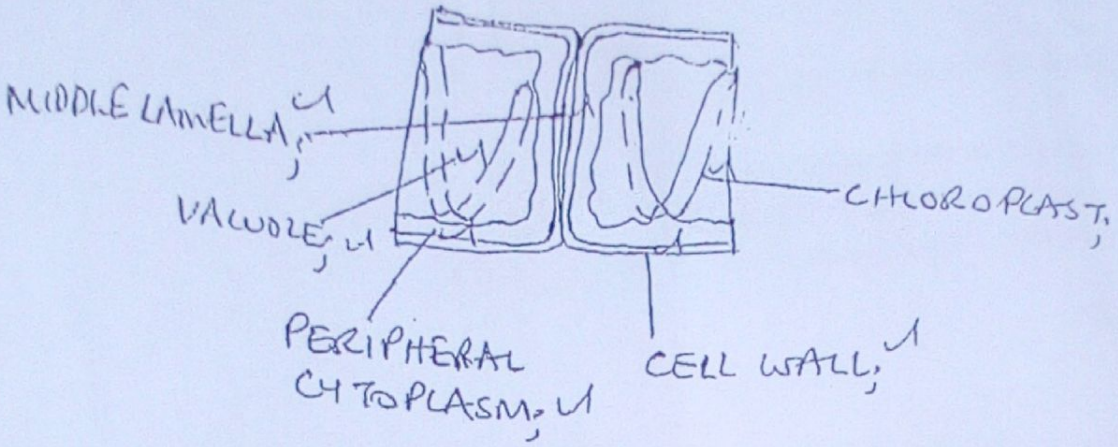
Mark any 1st 3, ignore the extra point
03 marks

(ii)

Water	Colured U
- Vacocile longer	- Vacoule Small
- Protoplasm intact	- Shrinks/pulls away from cell wall

Any 1
1 mark

DRAWING SHOWING THE PART WHERE TWO CELLS OF SPECIMEN S ARE JOINED TO EACH OTHER UNDER MEDIUM POWER MAGNIFICATION;



D = 02½
L = 02½
M = 0½
T = 0½
06

Magnified X200 – X400

Diameter field of view in micrometers = 1.5x1000 = 1500µm
No. of cells of S lengthwise along this diameter = 8-12 cells

Actual length of one cell = $\frac{1500}{noofcell}$ = (125-187.5µm) range

187.5µ m
12 = 125µm

Conversion
No. of cells
Formular
Length
04

Increased/large surface area means more chloroplasts exposed to trap more light energy; for maximum photosynthesis;

03

b (ii) Observations:

In water	Coloured solution
Pale coloured.	Deep coloured

Explanation:

In water cell sap was hypertonic; water observed by Osmosis; diluting the purple colour;
In solution u, solution was hypertonic, drews water from the cells sap by osmosis;
making the colored protoplasmic dark / deep;

@ ½ mark
5 marks

TOTAL = 30 MARKS

END

WAKISSHA JOINT MOCK EXAMINATIONS
MARKING GUIDE
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(a). Describe the structure of the following parts: - (NB: Stop marking once colour is mentioned)

(i). Exoskeleton in the abdomen (03 marks)

- Exoskeleton is of 2 cuticles; thin; broad; with overlapping; segments; the cuticles taper posteriorly; and are hard/chitinised; ventral cuticle is curved outwards; while dorsal cuticle is flattened/dorssovently flattened;

@ ½ mark
Max = (03 marks)

(ii) Tarsus

Tarsus is of 5; segments; the 1st and 5th are long; while the rest are short; in inner view the segments have pulvilli/plantulae at the joints; and are spined; hairy / round arolium/ 2 sharp pointed claws.

(iii) Antennae (03 marks)

- Antennae are paired; long; thin; hairy; cylindrical; and taper towards their tip; and segmented; with broad base.

(b) 1 Exoskeleton in abdomen (02 marks)

1- Broad/paired cuticles to cover whole body and offer protection;
Hard/chitinised for protection;
Dorsal / Flattened to easily pass through narrow cracks;
Segment cuticle for flexibility.

2 Thin to reduce weight during locomotion/flight;
Segmented for flexibility during locomotion/allow for growth;
any 1st 2, ignore extra points.

(02 marks)

(ii) Tarsus

1- Segmented for flexibility during locomotion; with pulvilli/plantulate to increase friction for firm contact with smooth surfaces;

2- Spinned for faster locomotion on rough surface/spines grip on rough surfaces;
any 1st 2, ignore extra points
(02 marks)

(iii) Antennae

1- Long to sense of a distance/all over the body;
Segmented for flexibility during sensing;

2- Tapers toward tip for increased flexibility;
3- Paired to increase surface area for sensing;
any 1st 2, ignore extra points