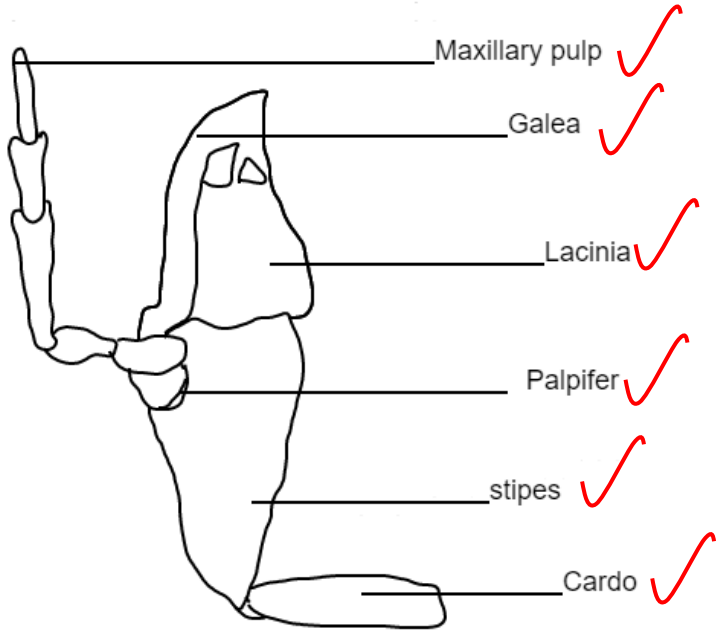
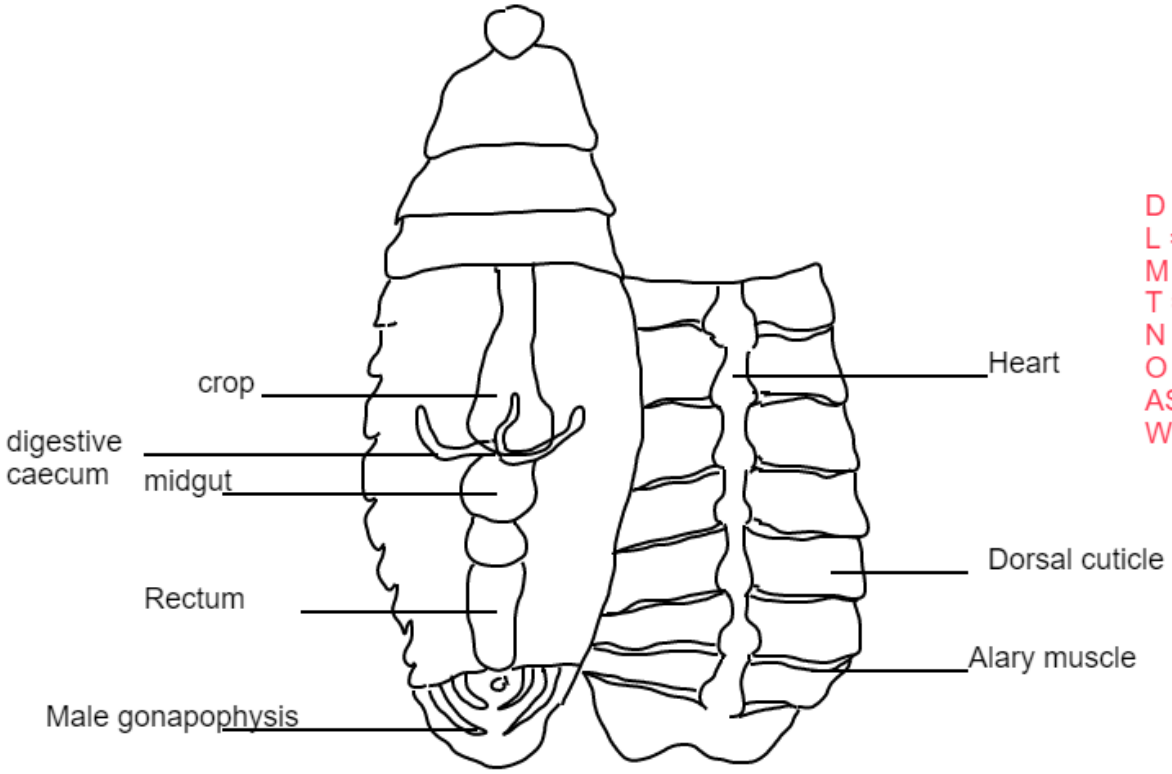
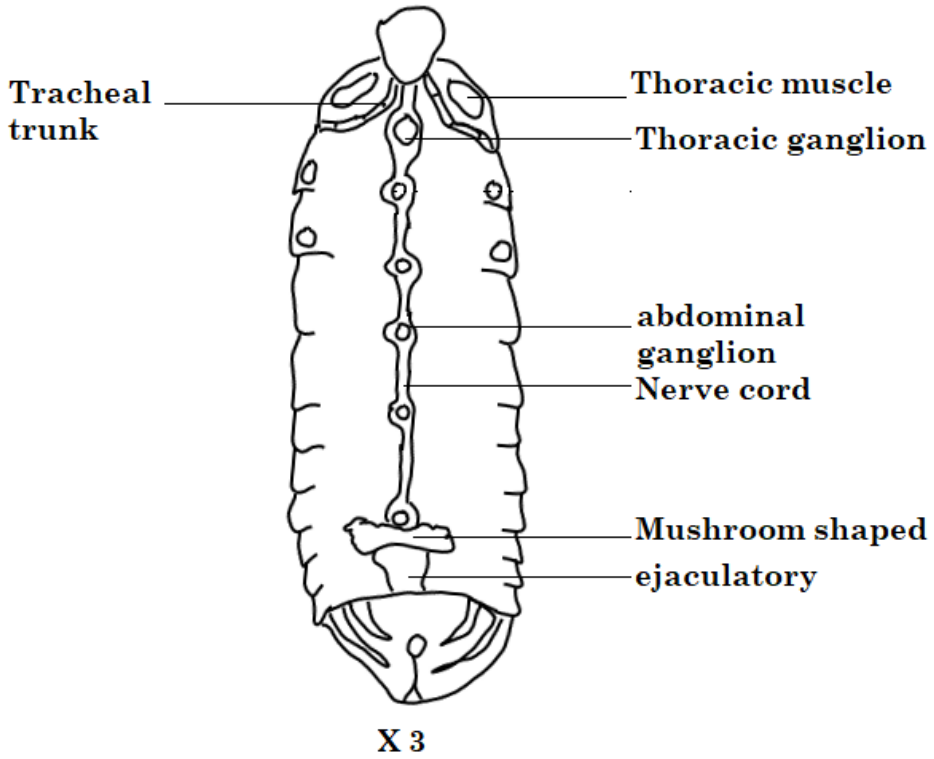
MATIGO EXAMINATIONS BOARD

P530/3
BIOLOGY
MARKING GUIDE 2023
PAPER 3

Qn	Answer	marks
1(a)	• They are long to sense a large area around the body/detect changes around at a distance. • They are thin foe easy swinging in all direction for increased sensitivity. • They are jointed/ segmented to increase their flexibility. • They are tapering for easy swinging in all directions.	03
(b)(i)	**Drawing showing the whole left maxilla of specimen U.**  X 10	06

(ii)	• Long maxially palps to reach food at a distance; grasping food into the mouth at a distance. • Segmented maxially palps for flexibility when manipulating food. • Having the lacinia and galea which are hooked for holding food. • Having lacinia with sharp edges for cutting food.	03
(c)(i)	**Drawing showing exposed structures in the abdominal region of specimen U without displaying any organ.**  D = 05 L = 05 M = 01 T = 01 N = 01 O = 01 AS = 01 WD = 01 16 X 3	16

(ii) Drawing of structures on the ventral cuticle of specimen U anterior to the left abdominal segment without the alimentary canal.



D = 3.5
L = 3.5
M = 01
T = 01
N = 01
O = 01
T = 11

11

Table 1

Solution	Tests	Observations	Deductions
W	To $1cm^3$,of solution is added 2 drops of iodine solution.	Turbid solution turns to pale brown solution.	Starch present
	To $1cm^3$, of solution is added to $1cm^3$ of benedict's solution then boil.	Turbid solution turns to pale blue solution. Pale blue solution on boiling.	Reducing sugars absent
	To $1cm^3$, of solution W is added $1cm^3$ of dilute	Turbid solution turns to intense purple solution.	Much proteins present

20

	sodium hydroxide solution followed by 2 drops of copper (ii0 sulphate.		
	To $1cm^3$,of solution W is added to$1cm^3$ 0f ethanol and $1cm^3$of water.	Colourless solution observed.	Lipids absent
	To $1cm^3$ of solution is added $1cm^3$ of dilute hydrochloric acid boil and cool. Add $1cm^3$of dilute sodium hydroxide solution; followed by $1cm^3$ of Benedict's solution and boil.	Turbid solution turns to pale blue solution which turns to green solution, yellow precipitate and finally orange or brown precipitate on boiling.	Much non –reducing sugars present
Z	To $1cm^3$,of solution is added 2 drops of iodine solution.	Turbid solution turns to blue – black solution.	Much starch present.
	To $1cm^3$, of solution is added to $1cm^3$ of benedict's solution then boil.	Turbid solution turns to pale blue solution which persists on boiling.	Reducing sugars absent
	To $1cm^3$, of solution W is added $1cm^3$ of dilute sodium hydroxide solution followed by 2 drops of copper (ii0 sulphate.	Turbid solution turns to purple solution.	Moderate proteins present
	To $1cm^3$,of solution W is added to$1cm^3$ 0f ethanol and $1cm^3$of water	Milky/white mixture when water is added.	Much lipids present.

Table 2

solution	Test	Observations	Deductions
W	Iodine test	Pale brown solution	Starch absent
	Benedict's test	Pale blue solution	Starch absent
	Biuret test	Intense purple solution	Much proteins present
Z	Iodine test	Pale black solution	Little starch present
	Benedict's test	Yellow precipitate	Moderate reducing sugars present
	Biuret test	Purple solution	Much proteins present

09

(b)(i)
- Z contains starch, proteins and lipids.
- W contains proteins and non – reducing sugars.

$02\frac{1}{2}$

(d)
- Saliva contains salivary amylase that catalyzed the breakdown of proteins in W.
- Salivary amylase in saliva did not catalyse the breakdown of proteins and non- reducing sugars hence they were still present in large quantities.

$03\frac{1}{2}$

(e)
- Enzyme are specific in nature.
- They catalyse reactions in optimum temperature of 37 – 40°C

02

3(i)

Differences

Specimen S	Specimen T
Has 8 limbs	Has 6 limbs
Has chelicerae	Has mandibles
Has two redipalps	Has 2 antennae
Lacks labial palps	Has labial palps
2 main body parts	Has 3 main body parts

03

(ii)

Similarities
- Both have exo skeleton.
- Both have segmented bodies.
- Both have jointed limbs.

03

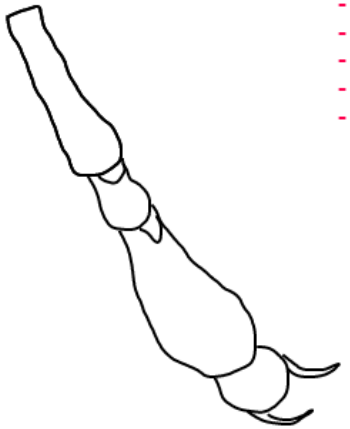
(b)

Structure	Description
1. Mandibles	Long; curved; hard; dull coloured/Black; tapering
2. Labial palps	A pair of short; thin; segmented; dull coloured/brown hairy.
3. Antennae	Short; segmented; dull coloured/brown, hairy

03

(c)(i)
- The antennae are hairy to increase sensitivity.
- Serrated mandibles for chewing the food.
- Many limbs for fast locomotion.

04

	• Segmented body for flexibility. • Large compound eyes for wide vision	
(ii)	Drawing of the three segments of specimen T plus structures associated with the segments. D = 05 M = 0.5 T = 0.5 N = 0.5 veiw = 01 Total = 07  X 20 Marking points - number of segments - shape of segments - pulvini - glandular pad - view - ventral	07
	Dichotomous key for identifying specimens P, Q, R, S, and T 1a) specimen with many limbs ……. P 1b) specimen with few limbs …… go to 2 2a) specimen with wings …… go to 3 2b) specimen without wings …… go to 4 3a) specimen with four wings …… Q 3b) specimen with two wings …… R 4a) specimen with eight limbs …… S 4b) specimen with six limbs …… T OR 1a) specimen with many limbs …… P 1b) specimen with few limbs …… go to 2 2a) specimen with hind limbs having pollen brush …… Q 2b) specimen with hind limbs lacking pollen brush …… go to 3 3a) specimen with wings …… R 3b) specimen without wings …… go to 4 4a) specimen with eight limbs …… S 4b) specimen with six limbs ……T	06

END

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