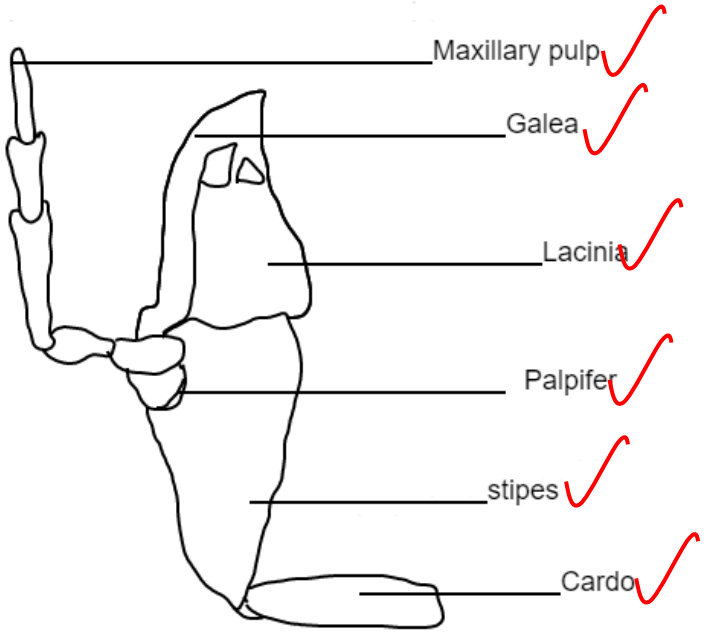
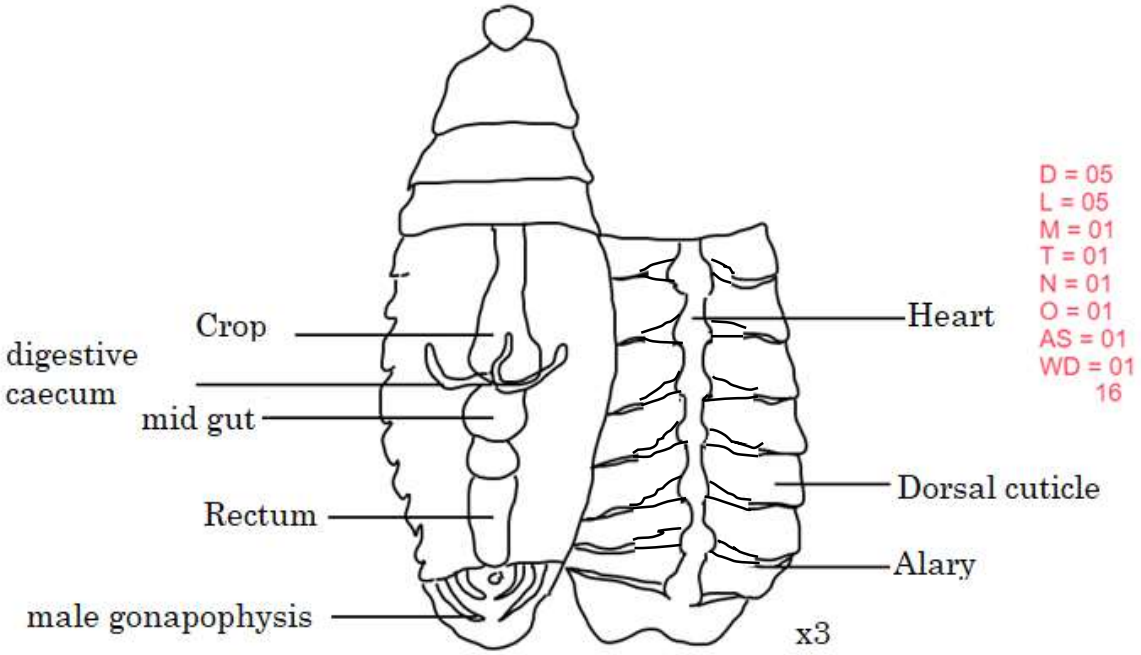
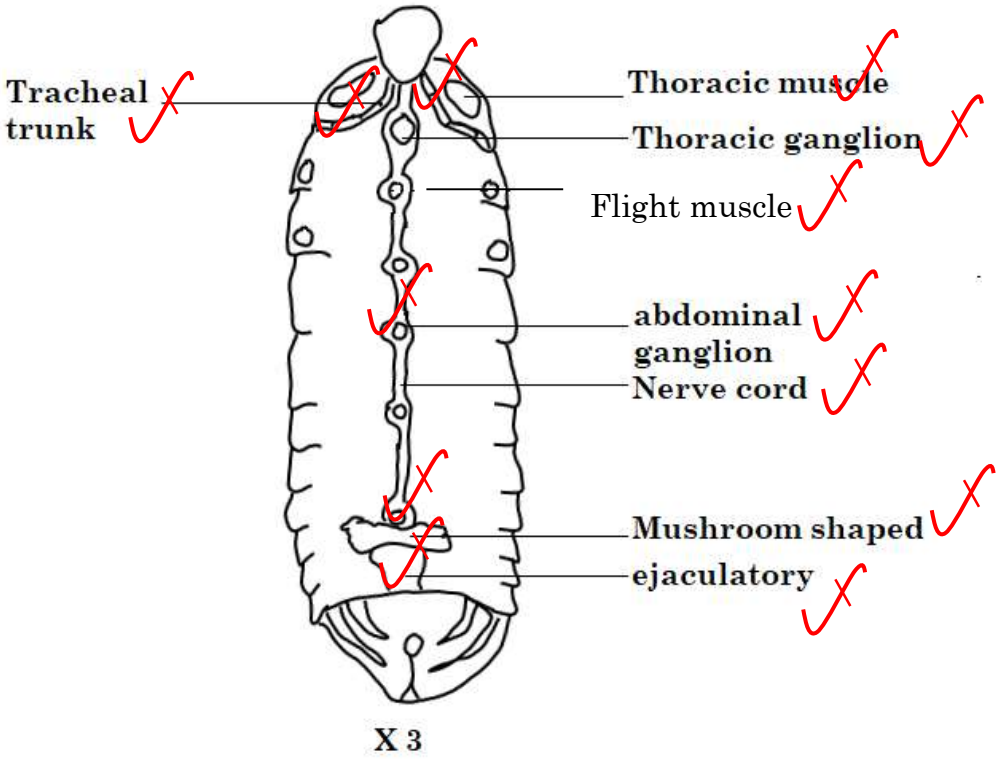
MATIGO EXAMINATIONS BOARD

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 for 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./ reduce air resistance	03
(b)(i)	**Drawing showing the whole left maxilla of specimen U.**  X 10	T = 1/2 A = 1/2 N = 1/2 M = 1/2 D = 02 L = 03 T = 06

(ii)	• Long maxillary palps to reach food at a distance; grasping food into the mouth at a distance. • Segmented maxillary 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	16

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



$D = 04$
$L = 04$
$M = 01$
$T = 01$
$N = 01$
$O = 01$
$T = 12$

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 absent
	To $1cm^3$, of solution is added to $1cm^3$ of Benedict's solution and then boil.	Turbid solution turns to pale blue solution. Pale blue solution persists on boiling.	Reducing sugars absent
	To $1cm^3$, of solution W is added $1cm^3$ of dilute sodium hydroxide solution followed by 2	Turbid solution turns to intense purple solution.	Much proteins present

20

	drops of copper (ii) sulphate.		
	To $1cm^3$,of solution W is added to$1cm^3$ 0f ethanol and $1cm^3$of water and then shaken vigorously and left to stand.	Colourless solution observed.	Lipids absent
	To $1cm^3$ of solution is added $1cm^3$ of dilute hydrochloric acid boil for 5minutes and then. 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 and 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 and shaken vigorously. Then left to settle	Milky/white mixture when water is added./an emulsion is formed.	Much lipids present.

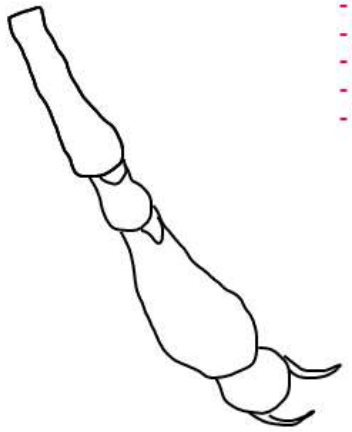
Table 2

solution	Test	Observations	Deductions
W	Iodine test	Pale brown solution	Starch absent
	Benedict's test	Pale blue solution	Reducing sugars
	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

W	Iodine	Turbid solution turns to a pale brown solution	Starch absent
	Benedict's	Turbid solution turns to pale blue solution which persists on boiling	Reducing sugars absent
	Biuret	Turbid solution turns to intense purple solution	Much proteins present
Z	Iodine	Turbid colourless solution turns pale black solution	Little starch present
	Benedict's	Turbid/colourless solution turns to pale blue solution on boiling the pale blue solution turns green solution and then to yellow precipitate.	Little reducing sugars present
	Biuret	Turbid/colourless solution turns to purple solution	Much protein present.

09

<table>
<tr><td>(b)(i)</td><td>• Z contains starch, proteins and lipids.
• W contains proteins and non – reducing sugars.</td><td>$02\frac{1}{2}$</td></tr>
<tr><td>(d)</td><td>• Saliva contains salivary amylase that catalyzed the breakdown of starch in Z to reducing sugars.
• Salivary amylase in saliva did not catalyse the breakdown of proteins and non- reducing sugars hence they were still present in large quantities.</td><td>$03\frac{1}{2}$</td></tr>
<tr><td>(e)</td><td>• Enzyme are specific in nature.
• They catalyse reactions in optimum temperature of 37 – 40℃</td><td>02</td></tr>
<tr><td>3(i)</td><td>Differences
<table>
<tr><th>Specimen S</th><th>Specimen T</th></tr>
<tr><td>Has 8 limbs</td><td>Has 6 limbs</td></tr>
<tr><td>Has chelicerae</td><td>Has mandibles</td></tr>
<tr><td>Has two pedipalps</td><td>Has 2 antennae</td></tr>
<tr><td>Lacks labial palps</td><td>Has labial palps</td></tr>
<tr><td>2 main body parts</td><td>Has 3 main body parts</td></tr>
</table></td><td>03</td></tr>
<tr><td>(ii)</td><td>Similarities
• Both have exo skeleton.
• Both have segmented bodies.
• Both have jointed limbs.</td><td>03</td></tr>
<tr><td>(b)</td><td>
<table>
<tr><th>Structure</th><th>Description</th></tr>
<tr><td>1. Mandibles</td><td>Long; curved; hard; dull coloured/Black; tapering</td></tr>
<tr><td>2. Labial palps</td><td>A pair of short; thin; segmented; dull coloured/brown hairy.</td></tr>
<tr><td>3. Antennae</td><td>Short; segmented; dull coloured/brown, hairy</td></tr>
</table></td><td>03</td></tr>
<tr><td>(c)(i)</td><td>• The antennae are hairy to increase sensitivity.
• Serrated mandibles for chewing the food.
• Many limbs for fast locomotion.
• Segmented body for flexibility.
• Large compound eyes for wide vision
• Cylindrical body for easy entry into debins
• Dark coloured/black for common shape
• Hard exo skeleton to prevent desiccation</td><td>04</td></tr>
</table>

(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

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