N

BIOLOGY P530/3 MARKING GUIDE

(a) - Segmented body; ✓
- Jointed appendages; ✓
- exoskeleton; ✓

03

(b) Segmented antennae for flexibility/long antennae to sense at a distance/Thin antennae to reduce weight for easy swinging; ✓

Toothed/serrated mandibles to easily cut solid food/Hard mandibles to crush solid food/to withstand pressure during crushing food; ✓

Large compound eyes to increase field of view; ✓

Jointed maxillary palps for flexibility/Hairy maxillary palp to increase sensitivity; ✓

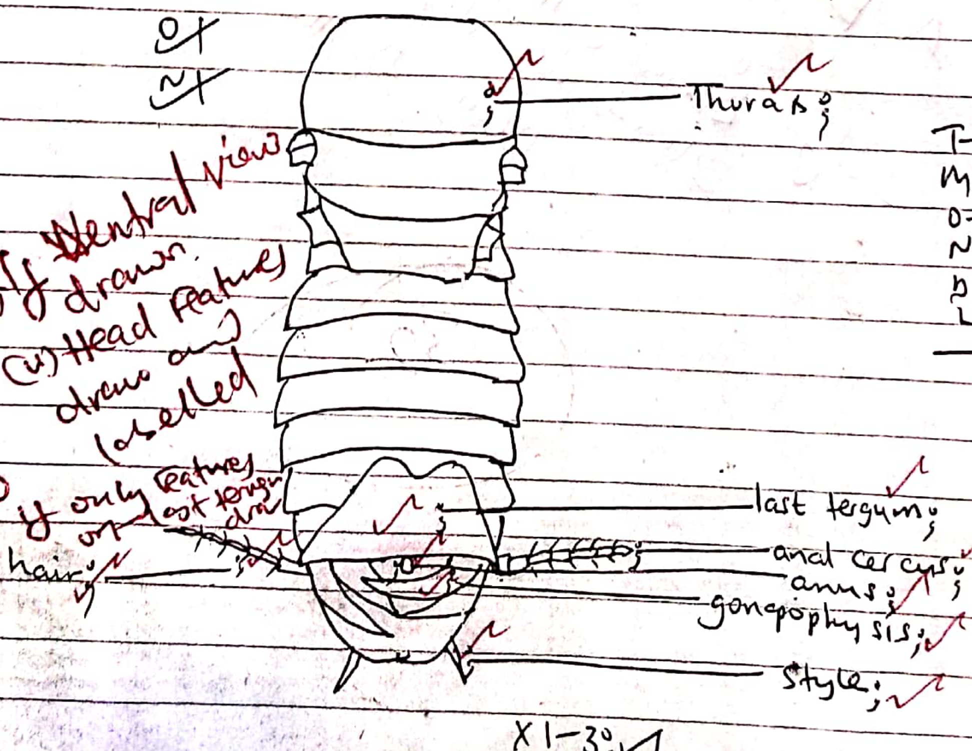
03

(1) Identify structure, (2) give a brief description and (3) state how the structure is related to function. (1) A structure is dealt with once!

(c) (i) Drawing of the trunk of specimen E from the dorsal view with the last abdominal segment turned over/lifted to expose the structures underneath/beneath; ✓

Refer to DWT → 218 Fig 34

O ✓
N ✓



NA (i) If ventral view drawn. (ii) Head features drawn and labelled

Deny O if only features of last tergum drawn

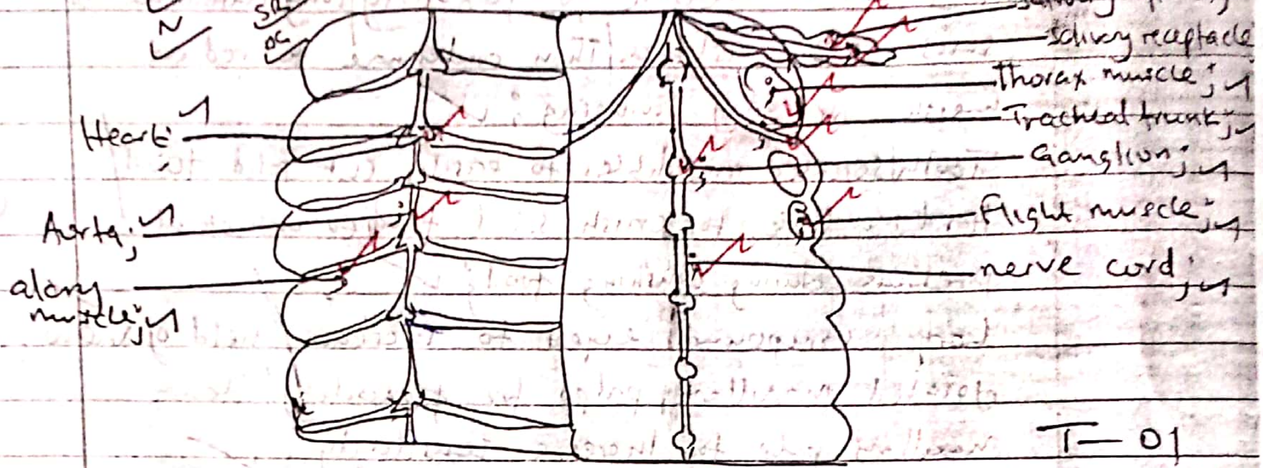
T — 0½
M — 0½
O — 0½
N — 0½
D — 03 max
L — 03 max

08

(ii) male; ✓ has styles/pointed anus ... increase ...

(d) Drawing of structures in the thorax and first three segments of the abdomen of specimen G with Gut cut out, dorsal cut, deflected to left and salivary gland to right;

O, N, GC, SR, DC



X1—3;

T—01
M—01
O—01
N—01
D—05
L—05
GC—01
SR—01
DC—01

17

GC— Gut cut out
DC— dorsal on left
SR— salivary gland on right.

NAD (i) If gut not cut deny D/L
(ii) If mushroom shaped gland drawn.
If Dorsal cuticle and salivary glands wrongly deflected. Award L. Deny D,

32

2. (a) Table 1 (Fh – Ih)

Test tube	Final length (cm)	change in length (cm)
A_1	3.1	0.1
A_2	3.2	0.2
B_1	2.8	-0.2
B_2	2.9	-0.1

06

For solution A acc value above 3 but $A_2 > A_1$
B acc value below 3 but $B_2 > B_1$
If value in A, B are same; Award one of them.

(b)(ii) Table 2.

Test tube	Observations	Deductions	
F.	Few; bubbles formed/ slow; effervescence	Slow; decomposition of solution H;	02
G	many; bubbles formed/ Rapid; effervescence;	Rapid; decomposition of solution H;	02

deny observation / deduction

If no procedure, deny observation / deduction.

04

(iii) Table 3.

Test	extract	Observations	Deductions	
To 1cm³; of extract F/G add 2/3; drops of Iodine solution;	F	Turbid/milky solution; turns to black; solution	much; starch present;	
	G	Turbid/milky solution turns to pale brown; solution	starch absent;	05
To 1cm³; of extract F/G add 1cm³; of Benedict's solution; and boil;	F	Turbid solution turns to pale blue; solution	reducing sugar absent;	
	G	Turbid solution turns to pale blue; to green; solution/yellow ppt/orange ppt	little/moderate/much; reducing sugars present;	05½
To 1cm³; of extract F/G add 1cm³; of sodium hydroxide solution; followed by 1/2; drops of copper(II) sulphate solution;	F	Turbid solution clears; then turns to purple; solution	moderate; protein present;	
	G.	Turbid solution clears then turns to blue ppt/pale purple solution	little protein present; / protein absent.	05

For Benedict's test, deny observations and deductions if condition is not stated / wrongly stated

Deny observation and deductions if (i) no procedure (ii) wrong procedure

15½

(C) (i)

~~solution A~~ Table 1

Cylinder in A_2 is longer than that in A_1; due higher sugar concentration in specimen G; due to sprouting; hence cylinder take in more water from solution; by osmosis; as solution A is hypotonic; solution B is hypertonic to cell sap of cylinder; ~~solution B~~ Cylinders; Cylinder in B_1 is shorter than that in B_2; since it loses more water to solution; since F has a higher water potential than specimen G; 05

Table 2

(ii) More bubble observed in G than F; since sprouting specimen G is more metabolically active; hence has a higher concentration of (catalase) enzymes than F; leading to more rapid breakdown of solution H; 02

(iii) Table 3.

As sprouting occurs in G, starch is less than in F is is broken down to reducing sugars; Reducing sugars increase than in F due to breat down of starch due to respiration; protein are less than in F since they are being used up in growth; 03

35½

35 mark

3. (a)

X - Has paired florets; arranged alternately on penduncle; one with short stalk/assesile; another sessile/no stalk; enclosed in braets; 02½

Z Three florets; attached on inner upper surface of bract; along midrib; floret stalked; but fused with midrib; 02½

(b) (i)

Floral Part	W	X	Y	Z
Anthers	small; bilobed; round	Large; elongated; bilobed;	large; elongated; bilobed;	round; bilobed; small;
Petals	5; large; free; smooth;	non;	5; fused; small; hairy;	Five; fused; hairy;
Bracts	non;	2 ~~petals~~; outer boat shaped; hairy; hard; inner smooth; thin;	non;	1; large; veined; smooth

A

II 10½

(ii) (a) Specimen with braets — — 2
(b) Specimen with no braets — — 3

2 (a) Specimen with large anther head — — X; ✓
(b) Specimen with small anther head — — Z; ✓

3 (a) Specimen with free petals — — W; ✓
(b) Specimen with fused petals — — Y; ✓

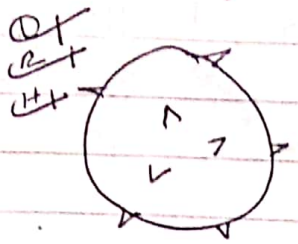
04

D - Dichotomy
I - Identification

II
D

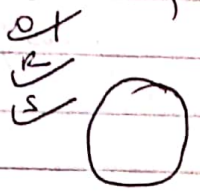
0-01
I-04
05

(c) Pollen grain from W



R – ½
O – ½
H – ½
½

Pollen grain from X



R – ½
S – ½
O – ½
½

(i)

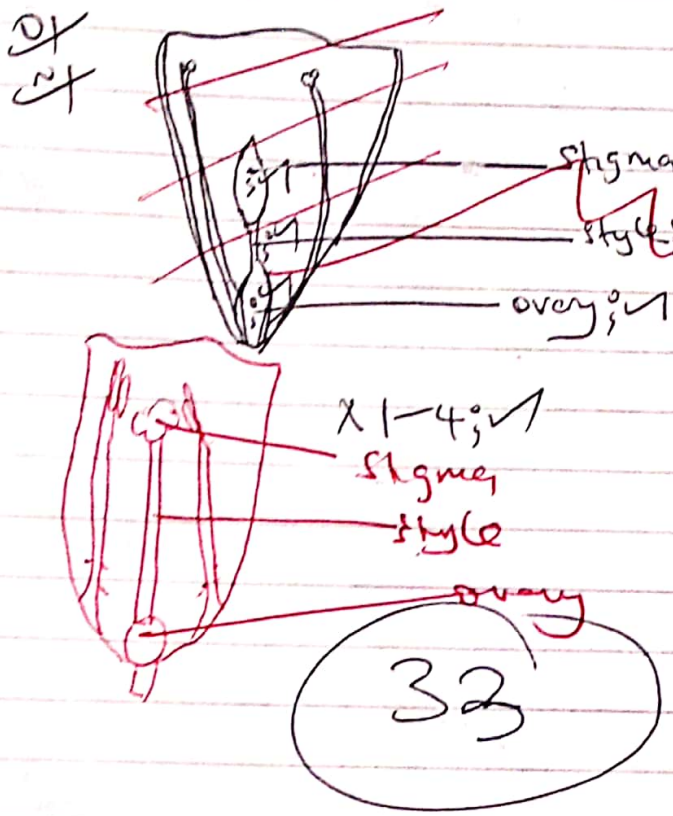
Pollen grain of W	Pollen grain of X
larger	smaller;
Hooked	no hooked;
Brightly coloured	dull coloured;

(ii) Specimen W; ~~Hooked pollen grain for att~~ Insected pollinated; Has hooked pollen grain for attachment on pollinators / brightly coloured to attract pollinators / large to increase surface area for attachment on pollinators; ½

Specimen X – ½
Wind pollinated; smooth to reduce resistance when blown by wind / small to easily be blown by wind; ½

0/1

(d) Drawing of one half of specimen showing pistil; 4



T – ½
H – ½
G – ½
N – ½
B – ½
L – ½
5

32