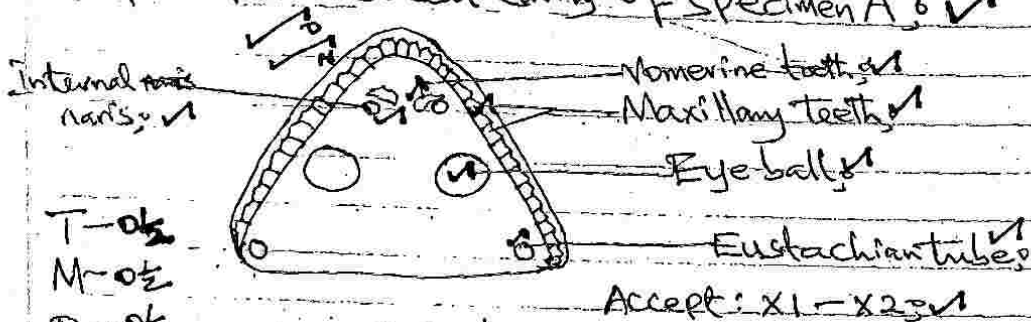


UNNAB - 2014  
Marking guide for PS3013 Botany Paper 3

(a) A drawing of the internal structures on the roof of the buccal cavity of Specimen A. ✓



T-0½  
M-0½  
D-0½  
N-0½  
D-02½  
L-02½  
07

Award

IR: If structures on the floor of the buccal cavity are drawn e.g. the tongue for both jaws drawn and all structures labelled.

i) Large, round eye balls to increase the field of views ✓

- Round small openings of the eustachian tube at the posterior region of the roof for allowing sound waves enter the inside of the ear; ✓

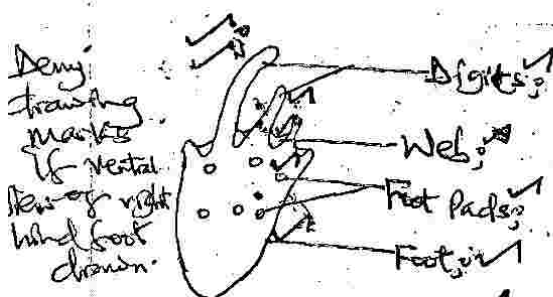
- Round small openings towards the tip for easing smelling and breathing; ✓

- Sharp vomerine teeth for killing the prey; ✓

- Numerous maxillary teeth with sharp edges top surface for siezing or capture holding the prey; ✓

- Eustachian tube for equalizing atmospheric pressure in the middle ear. ✓

(b) A drawing of the left hind foot from its ventral view of Specimen A; ✓



Award NA  
IR: dorsal view drawn

T-0½  
M-0½  
D-0½  
N-0½  
D-0½ max  
L-0½ max

OK: Fore foot  
Dorsal view  
Digits  
Foot pads  
Foot  
X1 - X2.5

(i) - Foot Pads for firm grip ✓

- Digits of varying lengths for increased grip ✓

Accept - Webbed digits of the hind foot for push against water to provide propulsive force during locomotion ✓

OWTTE

©2mk

T-01

M-01

O-01

N-01

D-08

L-08

A drawing of blood vessels that supply blood to left head region from the heart and those that drain the left forelimb, the liver and excretory structures in the trunk region of a toad specimen. A ✓

20

✓ deny 0 if left limb not structured ✓

Carotid artery ✓

uncus arteriosus ✓  
anterior venacava ✓  
W. monomyx ✓  
ventricle ✓  
hepatic vein ✓

Posterior venacava ✓

Award NA: if blood vessels/structures of alimentary canal included ✓  
blood vessels that drain the hind limb included ✓

1. Carotid artery ✓

1. Lingual artery ✓

1. Carotid labyrinth ✓

Left subclavian vein ✓

lungs ✓  
left brachio vein ✓

Liver lobes ✓

drawing mark goes for an unboxed blood vessel ✓

Renal vein ✓

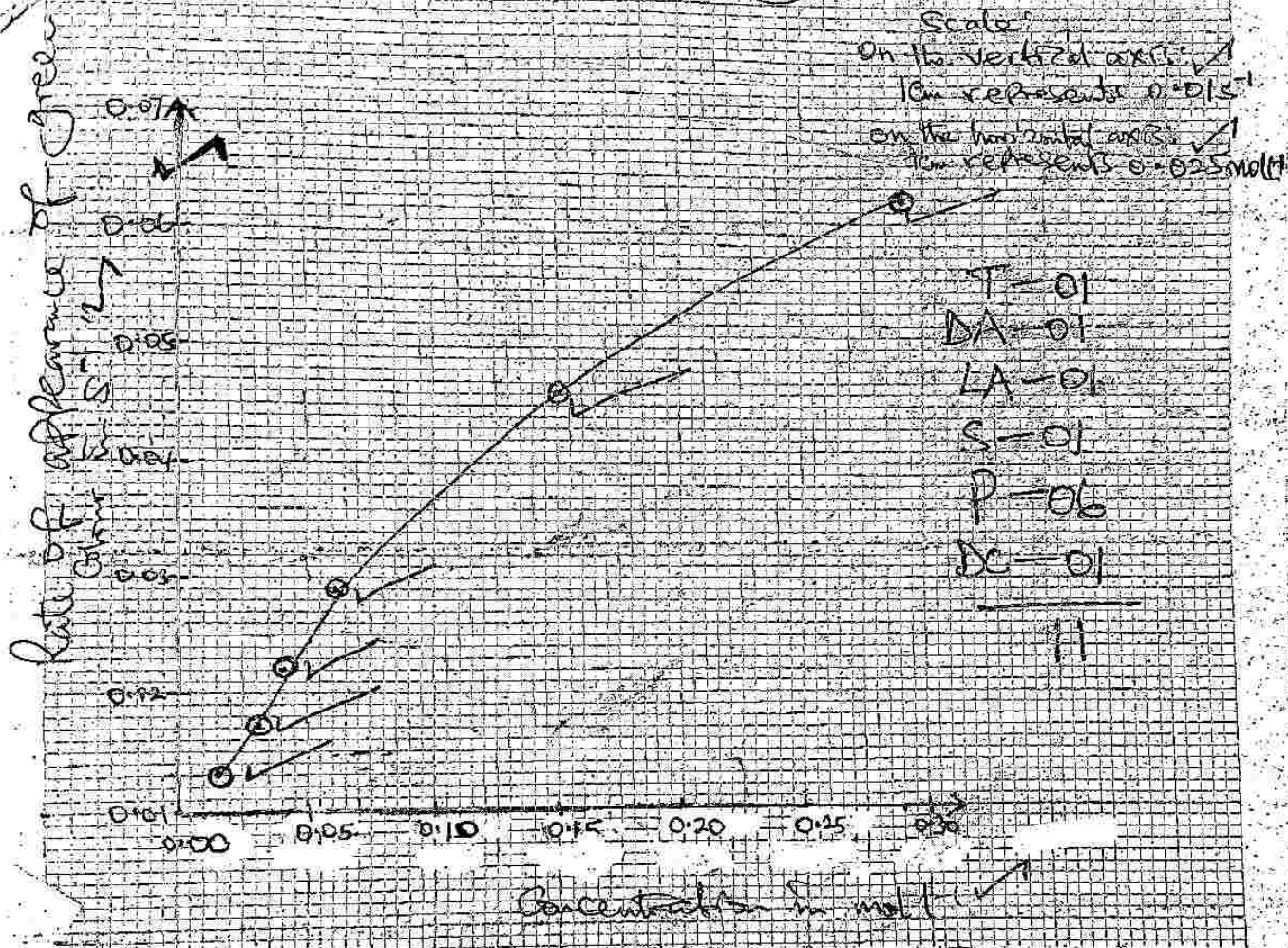
Left kidney ✓

X1-X2 ✓

Qn 20)

Concentration of Sucrose solutions, A - F respectively in $\text{Mol l}^{-1}$	Time taken for green colour to appear in seconds	Rate of appearance of green colour in $\text{s}^{-1}$
0.015	75.00 ✓	0.0130 ✓
0.03	60.00 ✓	0.0170 ✓
0.04	46.00 ✓	0.022 ✓
0.06	34.50 ✓	0.029 ✓
0.15	22.00 ✓	0.046 ✓
0.29	16.00 ✓	0.062 ✓
	ob	ob

A graph showing the variation in rate of appearance of green colour with change in concentration of sucrose





C (i) From  $0.00$  to  $0.06 \text{ mol l}^{-1}$  Sucrose:

Concentration, the rate of hydrolysis / rate of appearance of green colour increased rapidly. The concentration of sucrose is increasing, therefore limiting the reaction as some of the active sites of the enzyme, sucrase are not filled / occupied.

From  $0.06 \text{ mol l}^{-1}$  to  $0.29 \text{ mol l}^{-1}$ , the rate of hydrolysis / rate of appearance of green colour increased rapidly, gradually. This is because there is excess substrate / concentration and almost all the active sites of the enzyme are filled, and therefore the reaction is occurring at almost a maximum rate.

The enzyme concentration is limiting the rate of reaction at this stage.

Max

Enzyme  
(c) Hydrolysis / Enzyme breakdown of complex sugar;

Reason: The green colour appeared; and an indication of presence of reducing sugars, resulting from the breakdown of sucrose by the enzyme in W<sub>2</sub>.

02

(d) To denature the enzyme / Sucrase and stop its action in all tubes at the same time; so that a reliable comparison of the results could be made. ✓  
In addition a high temperature required for Benedict's test that is used to detect any reducing sugars produced; ✓

03

05

3(a) (i) Has a main axis, giving rise to 3 florets  
Flowers at its tip; the three florets end at the same  
level. ✓ Max 02

(ii) Has a thick Sacculent Main axis, giving rise  
to clustered florets, which are alternately  
arranged, with florets that are sessile.  
Flowers at the base are larger & longer than those  
towards the tip; bracts cover each of the clusters  
of flower and they are alternately arranged  
along the main axis; the bracts curve outwards  
and overlap. ✓ 02 Max

(iii) Main axis, swollen at its tip, and gives  
rise to numerous flowers, which vary in length  
and end at the same level. ✓ Max 02

(iv) Main axis, with lateral branches, giving rise to  
paired florets, one stalked and the other  
sessile, alternately arranged along the branches.  
Florets (at the base) overlap to form a column  
shaped arrangement of florets. ✓ Max 02

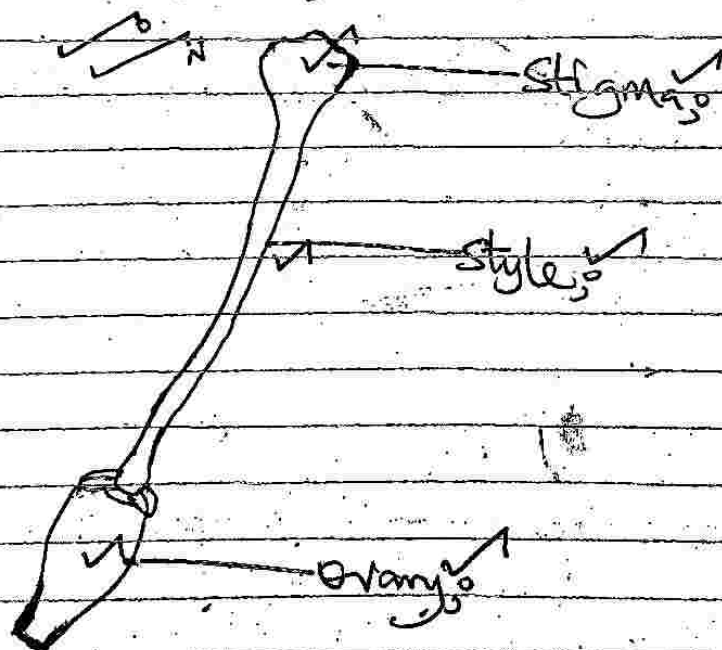
(b) Has a thick Sacculent Central axis, at the  
whose size reduces towards the tip, giving rise  
to clustered sessile flowers, which are alternately  
arranged along the main axis; florets / flowers  
are between the thick bracts; the bracts are closely  
packed / compacted towards the tip, and overlap giving  
a pointed spadix / structure towards the tip.  
The flowers at the base are longer than those  
towards the tip; and they curve outwards. ✓  
Max 02

C (ii)

One mark per box

Flower Part	Specimen
Sepals	$P_1$ Hairy; Free; thick; Pointed at their tips; rough; $R$ Thick; veined; Curved; Smooth; Ductile; <sup>Accept:</sup> perianth
Petals	Fused; thin; short; Veined; Thin; Smooth; Curved; Veined; Ductile; <sup>Accept:</sup> perianth
Stamens	Filaments are hairy at the base; Smooth; Vary in <sup>their</sup> lengths; Anther heads are elongated bilobed; notched at its base; Long filaments; whole are smooth; thick; widened / flattened Sacculent; Anther head long / elongated; bilobed thick

A drawing of the PART of the flower of R; ✓



X1 - X3 ✓

T - 0½  
 M - 0½  
 O - 0½  
 N - 0½  
 Δ - 0½  
 L - 0½

05



(d) A dichotomous Key for specimens T, R, Q, S and P in that order:

1 (a) Specimen has both <sup>stamens</sup> Specimen and PBT. ✓

1 (a) Specimen has both Stamens and PBT. ✓ goto 2.

1 (b) Specimen has Stamens Only. ✓

2 (a) Specimen has an inferior ovary. ✓ R

2 (b) Specimen has a superior ovary. ✓ goto 3

3 (a) Specimen has an elongated ovary. ✓ Q

3 (b) Specimen has a round ovary. ✓ goto 4

4 (a) Specimen has a short style. ✓ S

4 (b) Specimen has a long style. ✓ P.

8 Marks

Deny Marks

Whenever a candidate  
uses terms like  
Unisexual flower/  
bisexual flower/  
has been used

Accept any other correct  
Key so long as correct  
features and order is  
followed.

← END -