SUKELLEMMO JOINT PREMOCK 2022
231/3

Biology Paper 3

(Practical)

SUGGESTED MARKING SCHEME

1. (a) (i) Colour turns blue black.
(ii) Brown/yellow colour of iodine solution observed.
Accept: blue black colour fades/less blue black/patches of blue black

(iii) Starch present in the potato tuber changes iodine solution to blue black. Later starch present is hydrolysed to simple sugars/glucose/reducing sugars/maltose by enzymes (diastase) in potato tissue/cells; hence colour reverted/starts reverting to brown/yellow colour of iodine solution.

(b) (i) 2.5 cm^3 ±1

(ii) 4.5 cm^3±1

(c) Cutting C3 into smaller pieces increased the surface area of the potato in contact with hydrogen peroxide. C2 had a smaller surface area. Enzyme present/catalase catalysed decomposition of hydrogen peroxide into water and oxygen producing more foam in C3.

(d) (i) Little/no foam produced/ no (or few) bubbles produced

(ii) A lot of foam produced/many bubbles produced

(iii) Acidic pH conditions provided by HCl denature enzyme catalase present in potato tissue hence hydrogen peroxide not decomposed/decomposed slowly. Maximum activity of enzyme catalase requires alkaline pH conditions provided by NaOH hence faster decomposition of hydrogen peroxide into oxygen and water in (d) (ii) than in (d) (i).

(iv)The enzyme breaks down hydrogen peroxide produced in cells during metabolic reactions into oxygen and water otherwise it would be toxic to cells if allowed to accumulate.

Deny 1mk if student does not mention toxic nature of hydrogen peroxide.

2. (a)

Photosynthesis;

Gaseous exchange;

Transpiration; ***mark 1st two.***

(b)

Division Spermatophyta; **acc. Spermaphyta** ***penalize for wrong spelling***

Reason

Body differentiated into roots, stem and leaves;

Class Monocotyledonae; *penalize for wrong spelling*

Reasons

Fibrous root system; leaves have parallel venation; leaves have sheath-like petiole; ***mark 1st two***

(c)

Firm/rigid petiole that exposes the leaf/leaflets for maximum trapping of light/gaseous exchange; Many leaflets provide large surface area for photosynthesis; ***rej broad leaf***

Upper part is greener/has more chlorophyll to trap more light for photosynthesis; Thin (leaflets) to reduce distance of light penetration (to photosynthetic tissues);

Mark 1st 3

(d) Many / extensive fibrous roots/adventitious roots for anchorage/to absorb surface water; Green leaves containing chlorophyll that traps light for photosynthesis; Hairy leaves reduce transpiration;

Numerous nodes allow for propagation of the plant; ***Mark 1st 2***

3.

(a) ***See table below; mark horizontally award 1mk for each row correctly filled; max 2mks***

Plate	Name	Reason
1	Complete metamorphosis	Larval form quite different from adult; ***accept*** Four developmental stages undergone
2	Incomplete metamorphosis	Larval forms/nymphs resemble the adult; ***accept*** three developmental stages undergone

(b) Q: Egg R: Caterpillar; ***reject*** larva; D: Nymph Q

(c) There is less competition for food in plate 1(complete metamorphosis) as the larvae and adult forms feed on different foods. There is more competition in plate 2 as both the nymph and adult feed on same food.

The insect undergoing complete metamorphosis (plate 1) escapes adverse environmental conditions during the pupa stage(S) while the one in plate 2 does not. ***Mark 1st one***

(d) B →D →C →A

(e) ***See table below: award mk for any one correctly stated difference; mark 1st two X 2 = max 2mks***

R	S
Highly mobile	Immobile/sessile/stationary
Feeds a lot	Does not feed
Very active physically, less active physiologically	Inactive physically, more active physiologically

(f) Insects undergo internal fertilization after which the female lays many eggs; most have wings that make them very mobile.

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