



Confidential

MARK SCHEME

{6884/04}

MARKS: 40

1 (a) (i) A- 25 °C
 B- 72 °C; ® [1]

(ii) Table - closed margins;
 suitable headings: e.g. sample and observations;
 observations- all three observations are correctly entered; [1]

(iii) to give time (to the enzyme to act on the apple) [1]

(iv) high temperature denatures the enzyme; ® kill
 active site destroyed / altered;
 substrate unable to fit to the enzyme; [max. 2]

(v) control variables / control experiment;
 to verify that change observed was caused by the treatment;
 (A) For comparison / ref to reliability [2]

(vi) pH lower than optimum (which is pH 5 to 7);
 enzyme inactivated / denatured / active site altered; [2]

(vii) 1 use different fruits;
 2 cut / peel or slice the fruits;
 3 same size of fruits / same area exposed / kept at same temperature;
 4 ref to suitable temperature for browning maintained in different fruits
 5 leave for specified time / reference to time;
 6 ref to scientific measure;
 7 stated proper conclusion; compare the area covered by brown spots; [max. 4]

(b) (i) to control heating / gently heating / avoid over-boiling / safer to handle / even heating; [1]

(ii) - more time taken for chopped apple to turn brick red;
 - ref to slower reaction;
 - ref to error / stated error;
 - ref to chopping damages cell wall / contamination of cell contents;
 to accommodate error accept the following:
 - ref to chopping increases surface area / more reducing sugar exposed;
 - ref to increased rate of reaction / reaction faster;
 - ref to more collision of molecules; [4]

2 (a) (i) to remove water from the surfaces; ignore decrease / reduce / evaporate which will add to the water during the experiment/ ensure water released comes from the experiment; ref to validity; [2]

(ii) osmosis has occurred in **G**;
higher water potential in cells than outside where salt is sprinkled; ref to concentration gradient;
water moved out;
through partially permeable membrane [4]

(iii) decreased in size / reduced / shrink / smaller + water lost by (osmosis);
ref to plasmolysis / flaccid [1]

(iv) repeat the investigation;
use other fruit;
increase the sample size / more identical set-ups [max.2]

(b) (i) outline- single clear lines with no shading;
size occupies at least half the space provided;
detail- 2 layers shown (and thickness of layers shown); [2]

(ii) seeds; [1]

(c) (i) 73(mm); [1]

(ii) more water diffused into the potato than the other samples;
it had a lower water potential compared to the other samples; [2]

(iii) axes- labelled with units;
size- occupies at least half the grid and suitable even scale starting from 0
plotting- all bars correctly plotted;
bars- should have equal widths + equal spacing in-between bars and line graph [4]

(iv) 70 (mm); [1]