CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2012 series

5090 BIOLOGY

5090/61 Paper 6 (Alternative to Practical), maximum raw mark 40

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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1 (a) more with enzyme / less without enzyme / **AW** ;
15 (cm^3) + 6 (cm^3) ;
clear v cloudy / **AW** ; [3]
Must be comparative

A calculated difference
A idea of more pulp / apple residue when not using enzyme
Must be comparative

(b) (i) 1. axes correctly orientated pH on x, volume on y + fully labelled;
2. scale on y axis such that graph fills at least half printed grid and both scales linear, increasing from the origin ;
3. all plots clear and correct ;
4. smooth curve cleanly drawn through most plots or plots neatly joined by ruled lines ;[4]

2. if scales start from zero, look for scale breaks if non-linear
4. **R** if extrapolated to zero at either end.

(ii) 5 ; [1]

A correct reading from graph drawn

(iii) More/less juice /enzyme activity increases/decreases to / from optimum / pH5 / **AW**;
correct ref. to enzyme denaturing / active site shape changing; [2]

Need a description and an explanation for both marks.

(c) type of apple used ;
volume of apple pulp ;
volume of enzyme ;
concentration of enzyme ;
temperature ;
length of time (collection or resting);
AVP e.g. consistency of pulp / ripeness of apple; [max 4]

A 'amount' for 'volume'
A pH only if refer to buffers / **AW**;
max 1 AVP.

[Total 14]

2 (a) 1. part in box Y drawn as per instructions ;
2. suitable size + good proportions ;
3. clear, clean, continuous lines ;
4. at least 5 layers drawn ;
5. at least 3 roots drawn, with double lines ; [5]

2. at least 10cm from top to bottom.
roots – half bulb length and bulb approx. semi-circular
3. **R** if shading anywhere
4. Lines should converge at top and bottom

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(b) (i) nuclei clearly visible v not (clearly) visible;
contents fill cells v do not fill cells / cytoplasm shrunk / cell membranes pulled away from walls / **AW** ;
*plasmolysed; [max 2]

must be clear and correct comparison
A nuclei not present
A cell membranes not visible v visible
* plasmolysis either here or in **(b)(ii)**

(ii) 1. water moved out of cells / lost by cells ;
2. osmosis ;
3. correct ref. to concentration gradient (either in relation to solution or to water or water potential) ;
4. semi/partially/selectively-permeable (cell) membrane;
5. *plasmolysis ; [max 4]

ex-osmosis for 2 marks
* plasmolysis either here or in **(b)(i)**

[Total 11]

3 (a) (i) 5 digits / pentadactyl ;
smooth / hairless palm / hairs on back ;
4 fingers + 1 thumb / 4 digits with 2/3 joints + 1 with 1/2 ;
all digits are jointed / joints at similar positions;
nails ;
lines on palms ; [max 3]

A 5 fingers
idea of thumb different from fingers
A index finger longer than ring finger
A thumb opposable
Ig ref to thumb unqualified

(ii) own hand has less hair / smooth v hairy;
(own hand) has shorter fingers ;
(own hand) has longer thumbs ;
(own hand) has paler finger nails ;
(own hand) has shorter little finger ; [max 2]

ORA
Answers must be comparative
Ig Size / refs to skin colour

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(b) sweating;
evaporation of water/sweat (causes cooling);
OR
vasodilation / dilating blood vessels / more blood flow near the surface of the skin;
heat loss from blood; [2]

process identified + effect for 2 marks
R arteries, veins, capillaries
A arterioles
R blood vessels moving

[Total 7]

4 **(a)** add Benedicts ;
(starts) blue ;
heat / boil ;
(turns) green / yellow / orange / red ;
*safety – use of water bath / tongs / goggles ; [5]

A hot water bath for 2 marks
Ig brown

(b) add biuret or sodium or potassium hydroxide + copper sulfate ;
(starts) blue ;
(turns) mauve / purple / violet ; [3]

R heating

[Total 8]

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