CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2013 series

5090 BIOLOGY

5090/62 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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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1 **(a)** 1. (yeast produces) bubbles / gas / CO_2 ;

2. more in sucrose / AW / ORA ;

3. effect decreases with time /AW ;

3. correct manipulation of figures ; [max 2]

(b) **(i)** carbon dioxide / CO_2 ; [1]

(ii) limewater ; cloudy / milky / chalky / white ;

or

hydrogen carbonate indicator / bicarbonate indicator ; red to yellow ; [2]

(iii) respiration / fermentation ; [1]

(c) **(i)** so the yeast can rehydrate /AW ;

to reach 'warm'/ uniform temperature ;

(allow time) for reaction to occur / for fermentation (respiration) to occur / enzymes to act ; [max 1]

(ii) reliability / to calculate a mean or average / identify errors ; [1]

(iii) to prevent yeast settling / prevent yeast clumping / keep yeast evenly distributed / re-mixing of yeast with sugar ; [1]

(iv) 1. volume of (sugar) solution ;

2. concentration of / % of sugar in solution ;

3. mass of yeast ;

4. temperature (of the water / mixture) ;

5. time for counting bubbles / time for standing / no. of times bubbles counted ; [max 3]

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(d) (i) 1. distance PQ on drawing at least 60 mm
+ clear clean continuous outer line
+ main bodies of cells not shaded ;

2. good proportions with parent approx. x2 'bud' in length + joined by narrow region ;

3. nucleus in parent cell + at least one other inclusion in both the parent and daughter cells ;

4. cell wall indicated i.e. double outer line ; [4]

(ii) 1. line drawn on the drawing in PQ position ;

2. both measurements correct ;

3. correct expression for calculation ;

4. allowance for × 5000 ;

5. magnification recorded correctly; [5]

[Total: 21]

2 (a) 3 measurements between 28– 32 mm recorded ;

zone 1 larger than the other 2 ; [2]

(b) (i) iodine (solution) + black / blue-black ; [1]

(ii) 1. (starch) gone / removed / changed / broken down / digested / used up / less / no starch present ;

2. (starch converted to) reducing sugar / glucose / maltose ;

3. enzyme / amylase / diastase / carbohydrase (involved) ;

4. diffusion (of enzyme) ; [max 3]

(iii) 1. for germination / growth ;

2. (seeds contain) starch qualified ;

3. (must be changed) soluble / sugars ;

4. (for) respiration / energy release ;

5. before photosynthesis / because no photosynthesis / no chlorophyll / no chloroplasts ; [max 3]

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(c) 1. prepare solutions from ground seeds of two different types of plant ;

2. same mass of seeds / same volume of water ;

3. set up soaked (filter paper) discs /place discs on stained paper ;

4. leave for same length of time ;

5. measure / compare diameters (of clear zones) ; [max 3]

[Total: 12]

3 (a)

number of spots/leaflet	number of leaflets
0	3
1	3
2	3
3	(5)
4	3
5	1
6	1
7	0
8	1

[2]

(b) *bar chart – A. either orientation*

1. both axes labelled with appropriate scale + 0,1,2 etc. in centre of bar or row ;

2. bars of equal width with sides ruled in ascending order of number of spots (0-8) ;

3. all plots plotted correctly ; [3]

(c) more / larger spots in non-polluted area / ORA ;

more air pollution less disease / leaves more healthy in polluted area / ORA ; [max 1]

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(d) larger sample / use more leaflets ;

compare leaflets of same age / same size / same position on plant / same bush ;

all leaves from same species ; [max 1]

[Total: 7]

[Paper Total: 40]

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