

CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

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MARK SCHEME for the October/November 2013 series

5090 BIOLOGY

5090/62

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

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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 / CO₂ ;
2. more in sucrose / AW / ORA ;
3. effect decreases with time /AW ;
3. correct manipulation of figures ; [max 2]
- (b) (i) carbon dioxide / CO₂ ; [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 $\times 5000$;
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]