CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2013 series

5090 BIOLOGY

5090/31 Paper 3 (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) ruled clear lines;
3 columns labelled A, B, C + 6 rows 0, 2, 4, 6, 8, 10;
°C + min(ute)s appropriately recorded at least once;
six readings recorded for all 3 tubes;
temperatures decreasing with time in all three tubes; [5]

(b) (i) 1. time (x axis) + temperature (y axis);
2. both axes labelled + units + linear scales; (minimum time/min & temp/°C);
3. good use of grid (at least half used);
4. correct plots;
5. plots joined cleanly or lines of best fit drawn;
6. lines identified by label or key; [6]

(ii) Temperature decreases/falls/in all three;
most/fastest in A;
least/stays the same in B;
intermediate in C/AW;
temperature changes calculated for each tube; max [3]
A. correct answers in terms of heat loss

One mark each for an improvement and an explanation for that improvement up to 4 max from the following:

(iii) **Imp** – repeat/replicate;
Exp – increase reliability/identify error/calculate mean/average;
Imp – use hotter water at the start/use of thermometers;
Exp – greater difference in temperature of water and room/heat loss more pronounced;
Imp – water at same temperature in all tubes at the start;
Exp – same amount of heat available to be lost;

Imp – same volume of water in all tubes at the start;
Exp – same amount of heat available to be lost;
Imp – similar external conditions for all tubes/same room temperature/use screen/prevent draughts;
Exp – prevent (variable) external conditions influencing the rate of heat loss /AW;
max [4]

(c) (i) **B**; [1]

(ii) lowers surface area (for heat loss) to volume ratio;
ref. to insulation:
heat transferred from hotter to colder ;
less heat radiates / lost to environment ;

[Total: 21]

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2 **(a)** leaves of shoot **D** at an angle;
leaves of shoot **E** dropped near to stem/wilting/facing down/ORA;
leaves of shoot **D** firm to touch;
leaves of shoot **E** limp/flexible/withered/shrivelled/dried up/crinkly/ORA; max [2]

(b) **(i)** number of sections in D;
number of sections in E; [2]
check Supervisor's report

(ii) distance for shoot D;
distance for shoot E; [2]
check Supervisor's report and answer to **(b)(i)**

(iii) transpiration/evaporation/capillarity; [1]
Ig. Diffusion
R. Osmosis

(iv) water lost at faster rate in **D**;
greater leaf surface area in **D** than **E**/AW;
guard cells flaccid/stomata closed in **E** /ORA; max [2]

[Total: 9]

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3 (a) (i)

type	length	no.	surface	root
incisor	-	**8**	**chisel/flat/straight/even/AW**;	-
canine	-	-	**pointed /sharp**;	**single**;
premolar	-	**8**	-	**single**;
molar	-	-	**uneven /rough/cusped**;	**double /triple**

[3]

All 8 correct = 3
6 or 7 correct = 2
4 or 5 correct = 1

(ii) incisors – cutting and biting;
molars – crushing and grinding; [2]
R. chewing for incisor
A. chewing for molar

(b) (i) more/38 v 32/19 v 16;
canines larger/AW;
canines more pointed/sharper;
more premolars;
more premolars in lower than upper jaw + same no. in humans;
premolars of different sizes/shapes + similar in humans;
molars of different sizes/shapes + similar in humans;
last molar is smaller than others + same size in humans;
(dog) molars have double (or single) roots + human molars have triple (or double);
some premolars(dog) have double roots + human premolars have single;
crowns different heights/more uneven (in dogs) + similar height/even in humans/AW;
molars in dogs are uneven/pointed/AW + flatter/AW in humans; max [3]

Ig. vague differences between dog/human teeth
A. rough/rougher = uneven

(ii) piercing/holding/gripping/killing/tearing/ripping; [1]

(c) More than one area of shading between teeth/shading at boundary of gum; [1]
A. shading around sides of teeth/boundary of gum with *lighter* shading over surface
R. if all fully shaded

[Total: 10]

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