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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

General Certificate of Education O Level

MARK SCHEME for the November 2004 question paper

5090 BIOLOGY

5090/06 Paper 6 (Alternative to Practical), maximum mark 40

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

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NOVEMBER 2004

GCE O Level

MARK SCHEME

MAXIMUM MARK: 40

SYLLABUS/COMPONENT: 5090/06

BIOLOGY
Paper 6 (Alternative to Practical)

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1 (a) (i) crush/cut/sample (piece of storage organ);

add iodine; **2**

(ii) into boiling/hot (water);

decolourise/remove chlorophyll;

in (hot) ethanol;

water bath/safety feature;

(soften) in <u>water</u>; **up to 4**

(b) (i) water and ions/minerals/salts/NO_3;

<u>xylem</u>;

take first from: transpiration, turgor, photosynthesis/growth/CHO or protein formation/hydrolysis/cooling; **3**

R: food/support references

(ii) sucrose/sugar/aas.; **R** glucose

<u>phloem</u>;

(storage as, formation of etc) starch;

R list – starch, protein fat etc.

A protein formation/growth if ass. carried

respiration/oxidation; **R**: energy reference, especially 'production' **up to 3**

(c) (i) asexual/vegetative; **1**

(ii) all have identical/alike (genotypes)/clone; **1**

Total 14

2 (a) **A** = cornea **B** = lens

C = iris **D** = optic nerve

2 correct = **1**, 3 correct = **2**, all correct = **3**

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(b) iris and pupil size related;

reference <u>radial and circular muscles</u>;

correct reference effect on pupil of one of the muscles;

A: identification by letter **up to 2**

lens less/more convex; (i.e. qualified change in shape) – ignore context distant etc.

R shorter, bigger, stretched etc.

reference ciliary muscles/susp. ligaments; **2**

if **C** identified as susp. ligs allow 1 for correct lens effect

(c) blind spot correct and clearly labelled **Y**;

fovea correct and clearly labelled **Z**; **2**

if no crosses – 1 max if both correct

Total 9

3 *[see graph]*

(a) graph marks: **4**

1 good size, clear plots

2 axes labelled and numbered regularly
(temp ^{o}C, oxygen/arbitrary units)

3 accurate plotting, all points

4 well ruled between points/good curve

Axes reversed – allow 1 and 4

*Bar/column graph – allow 2, 3 and 4 – if reversed – allow **4** only*

(b) reading: in range 0 - 10 (a) u. oxygen (evolved);

reason: enzyme <u>denatured</u>/<u>inactivated</u>;

R killed, destroyed **2**

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(c) repeat using smaller intervals;

within range 30 – 50 but either side of 40^{o};

replication and calculation of mean; **up to 2**

Total 8

4 (a) Drawing marks: **D.3**

1 necessary parts included, at least 6 cm, clear, clean and realistic, mostly double lines

2 stigma and style clearly differentiated from stamens, correctly situated

3 6 - 8 stamens clear

labels: style and stigma;

anther and filament/stamen; **2**

(b) length of anther on Figure (e.g. 6 mm or 0.6 cm) and clear indication where measured;

equivalent dimension on drawing, expressed over above (**A** if not anther);

allowance for x 2 reproduction of Figure 4.1;

correctly calculated and correctly expressed magnification; **4**

up to 2 decimal places **R** rounding above 0.2

Total 9

Maximum for paper 40