UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

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.

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1 (a)

	green	white
A	13	5
B	21	6
Total	34	11

6 correct 2 marks
5 correct (with 1 ecf) 1 mark
all numbers ×2 and correct 1 mark [2]

(b) (34:11 = approx) 3:1 ;
result of crossing heterozygous (parents) ;
(inheritance due to) single pair of alleles / two alleles / single gene / monohybrid inheritance ;
green dominant or recessive white ;
discontinuous inheritance or variation ; [max 4]

(c) grow more seeds / repeat ;
even distribution / not random / reduce competition idea ;
constant / exactly the same condition(s) (for growth / germination) ; [max 2]

(d) green or chlorophyll + photosynthesis ;
carbohydrate (starch, sugar, glucose) production;
reference to use of carbohydrate for growth ;

if only a ref. to seedlings in **A** because less competition / AW max 1 [3]

[Total: 11]

2 (a) **C** capillary / shunt ;
D sweat gland ; R duct
E hair follicle / root / papilla / bulb ; [3]

(b) more / less blood near surface or to the skin or through **C** ; R if movement of vessels
heat lost / conserved ; R loss / conservation of energy
(vaso)dilation / (vaso)constriction ; R if of capillaries
at least one means of heat loss i.e. conduction, convection, radiation ; [max 3]

If **C** has been incorrectly identified in **(a)** allow max 1 mark for a correct answer in relation to the part identified as long as it is a skin 'structure' e.g. temperature receptor

[Total: 6]

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3 (a)

F		**G**
carpel / ovary / ovules / style / stigma / pistil / gynaecium present	+	any of these absent ;
any of these absent	+	stamens / anthers / filaments / androecium present ;
swollen area present	+	swollen area absent ;
short(er) stalk	+	long(er) stalk ;

OVP – must be comparative ; [max 2]

(b) (i) magnification stated as ×540 / ×550 / ×560 / ×570 / ×580 with or without working ;;;
if × or times absent ;;

if this answer not given then look at any working for
27 – 29 mm ;
$\frac{28}{0.05}$ or $\frac{56}{0.1}$ (adjusted appropriately for 27 – 290) ;

allow max. 1 for correct result of any calculation with × or times [3]

(ii) cross pollination / male and female flowers / transfer to female flower;
by (named) insect / animal ;
spines / spikes / sticky / rough surface of pollen grain ;
reproductive structures enclosed within flower / not exposed / AW ; [max 3]

(c) drawing complete section drawn at least 6 cm diameter with clear, clean lines and double line indicating outer layer ;
proportion of seed area to fruit wall correct ;
at least 5 seeds drawn in correct position ; 3

labels seed ;
fruit wall / pericarp / epicarp / mesocarp / endocarp ;
vascular bundle ; max 2 [5]

(d) equal masses / volumes of both fruits ;
fruits at same stage of ripeness ;
prepared by crushing / extracting juice / AW ;
add Benedicts and heat ;
colour change described in terms of (blue) green yellow orange red ;
comparison of speed / depth of colour change ; [max 5]

(e) (i) axes correctly orientated and fully labelled (or key provided) ;
suitable scale on *y*-axis ;
correct plotting ;
bars ruled and of same width ; [4]

(ii) 3.175 / 3.18 / 3.2 ; [1]

[Total: 23]

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