UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2005 question paper

0610 BIOLOGY

0610/02 **Paper 2 (Core Theory), maximum mark 80**

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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The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

CIE is publishing the mark schemes for the October/November 2005 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

1

description of animal	group
	crustacean;
	mollusc;
	bird;
	mammal;
	insect;

[5]

Total [5]

2 **(a)** temperature / hot / cold;

touch / texture;

pressure;
Any two – 1 mark each **[2]**

(b) **(i)** **X** labelling retina; **[1]**

(ii) **Z** labelling the iris; **[1]**

(c) sensory neurone in correct box;

relay neurone in correct box;

motor neurone in correct box; **[3]**

If all neurones correctly named but errors in placement – allow 1 mark

(d) rays of light bent / refracted by cornea;

ciliary body / muscle contracts;

and releases / lessens pull on suspensory ligaments;

lens becomes more curved / convex;

bends rays of light more (to bring about focus);

Any four – 1 mark each **[4]**

Total [11]

3 (a) (i) excretion is removal of waste materials formed by the body / metabolism; **[1]**

(ii) egestion is removal of undigested / undigestible materials **[1]**

(b) (i) liver; **[1]**

(ii) (excess) amino acids / ammonia / ammonium compounds; **[1]**

(c) **Q** – renal artery;

R – vena cava;

S – ureter;

T – urethra; **[4]**

(d)

component of blood	present in urine
glucose	x
red blood cells	x
salts	✓
urea	
water	✓
white blood cells	

salts and water correctly indicated;

glucose and red blood cells correctly indicated; **[2]**

Total [10]

4 (a)

tube	contents and conditions	is photosynthesis happening	is respiration happening
A	pond weed in dark	no	yes;
B	pond weed in bright light	yes	yes;
C	freshwater shrimp in dark	no	yes;
D	fresh water shrimp in bright light	no	yes;

One mark for each correct row **[4]**

(b) (i)

tube	contents and conditions	colour of hydrogencarbonate indicator after several hours
A	pond weed in dark	yellow / golden
B	pond weed in bright light	purple
C	freshwater shrimp in dark	yellow / golden
D	fresh water shrimp in bright light	yellow / golden

tubes **A**, **C** and **D** all correct;

tube B correct; **[2]**

(ii) <u>yellow colour</u> -
tubes A / C / D respiration occurring;

carbon dioxide released / increased / pH falls;

similar for two other / named tubes;
<u>purple colour</u> –
tube B both respiration and photosynthesis occurring;

more photosynthesis than respiration;

carbon dioxide absorbed / reduced and pH rises;
Any four – 1 mark each **[4]**

Total [10]

5 (a) (i) light; **[1]**

(ii) photosynthesis; **[1]**

(b) overall a rise in carbon dioxide concentration in atmosphere;

there is a yearly rise and fall / varies with the seasons; **[2]**

(c) (i) more carbon dioxide in air;

more heat rays trapped;

leads to an increased air temperature; **[3]**

(ii) utilise more renewable energy sources / named example;

reduce use of fossil fuels;

reduce deforestation / increase plant growth;

Any two – 1 mark each **[2]**

Total [9]

6 (a) (i) (cross) pollination; **[1]**

(ii) bee feeds at flower A / flower with mature anther / stamen;

bee picks up pollen (on body / hairs);

moves to flower B / flower with mature stigma / carpel;

pollen deposited (on stigma);

bee transfers pollen – 1 mark max

Any three – 1 mark each **[3]**

(b) (i) fertilization; **[1]**

(ii) ovary / carpel; **[1]**

(c) similar as are same species / have same genes;

gametes formed by meiosis;

similar but not genetically identical / OWTTE;

ref. to cross pollination / pollination being random;

fertilization random / OWTTE;

genotypes of offspring very likely / will be different;

effects of environment can affect plants;

any other valid point;

Any four – 1 mark each **[4]**

Total [10]

7 **(a)** **(i)** 11.1 dm^3 per minute; **[1]**

(ii) 2 dm^3 per minute; **[1]**

(iii) 3.4 / 3.3 dm^3 per minute; **[1]**

(b) **(i)** left ventricle; **[1]**

(ii) prevent the backflow of blood; **[1]**

Total [5]

8 **(a)** **(i)** increased surface area; **[1]**

(ii) xylem; **[1]**

(b) magnesium – making chlorophyll;

nitrates – making amino acids / protein; **[2]**

(c) **(i)** to replace ions removed by crops;

to improve crop yield;

Any one – 1 mark **[1]**

(ii) eutrophication can occur;

excessive growth of algae;

light to lower layers of water body reduced;

submerged / floating water plants die;

decomposer bacteria increase rapidly;

use up oxygen;

anaerobic conditions occur / aquatic animals die;

Any five – 1 mark each **[5]**

Total [10]

9 (a) (i) letter D clearly labeling vagina near to cervix; **[1]**

(ii) letter F clearly labeling oviduct; **[1]**

(iii) letter O clearly labeling ovary; **[1]**

(iv) letter P clearly labeling point within uterus; **[1]**

(v) letter S clearly labeling oviduct; **[1]**

(b) (i) may be of different / incompatible blood groups / risk of damage to red blood cells of fetus;

to prevent transfer of pathogens / toxins / drugs;

maternal blood pressure much higher than that of fetus / could damage fetal vessels;

Any two – 1 mark each **[2]**

(ii) transfer of oxygen from mother to fetus;

transfer of minerals / vitamins from mother to fetus; (undigested nutrients)

transfer of carbon dioxide from fetus to mother;

transfer of urea / OWTTE from fetus to mother;

transfer of antibodies from mother to fetus;

production of progesterone;

prevents transfer of pathogens / OWTTE;

Any three – 1 mark each **[3]**

Total [10]