UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2008 question paper

0610 BIOLOGY

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

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.

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.

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UNIVERSITY of CAMBRIDGE
International Examinations

1 **(a)** growth;
excretion (needs ref. to metabolic waste but not toxic waste);
nutrition (I – feeding);
movement (I – locomotion);
irritability/sensitivity (A – response to stimulus, I – sense/sensations/sensory);
reproduction (A – produce offspring);

accept any correct definitions
any four – 1 mark each [4]

(b) respiration is release of energy (from sugar);
A – correct equation with ref. to energy
R – produce/make energy

breathing is moving air/gases in and out of lungs/body/OWTTE;
I – ref. to specific gases [2]

[Total: 6]

2 1st space: <u>small;</u>
2nd space: <u>dull</u>;
3rd and 4th spaces: <u>light</u>; <u>dry</u>; (in either order)
5th and 6th spaces: <u>stamens</u>; <u>style</u>; (in either order)
must use words from the list
if more than one word in a space – mark first word and ignore the rest [6]

[Total: 6]

3 **(a)**

food material	digestive enzyme	end products of digestion
(*starch*)	amylase/ptyalin carbohydrase;	(*simple sugars*)
protein;	protease/pepsin/ trypsin;	(*amino acids*)
(*fat*)	(*lipase*)	fatty acids; glycerol;

I – refs to salivary/pancreatic

Beware refs to glycogen/glucose etc

[5]

(b) [amino acids]
broken down/deaminated;
formed into urea;
passed into/transported by blood/to be excreted/OWTTE;
I – refs to kidney functions

[glucose]
changed to glycogen;
stored (in liver/muscles);
R – stored as fat

Any four – 1 mark each [4]

[Total: 9]

4 (a) (i) carbon dioxide/CO_2;
water/H_2O;
R – sunlight/light [2]

(ii) oxygen/O_2; [1]

(b) (i) iodine/potassium iodide (solution); [1]
mark **(b)(i)** and **(b)(ii)** independently.

(ii)

area	colour
A	brown colour;
B	brown colour;
C	black colour;
D	brown colour;

for brown accept colours of diluted iodine solution e.g. red-brown, amber, orange and yellow
for black accept blue-black [4]

(iii) [area **B**] no photosynthesis/starch as no chlorophyll/chloroplasts;
[area **D**] no photosynthesis/starch as no light; [2]

[Total: 10]

5 (a) (i) **J** – vena cava;
K – right atrium/RA;
L – aorta;
M – left ventricle/LV; [4]

(ii) both vena cava and pulmonary artery shaded;
I – shading in RA and RV
R – if shading in left side of heart [1]

(iii) arrows showing inflow via pulmonary vein
+ from atrium to ventricle
+ outflow via aorta;
R – if any arrows shown in VC to PA circuit [1]

(b) to prevent backflow/ensure one way flow of blood/OWTTE;
I – refs to semilunar valves/action
I – ref to valve names for **X**
I – ref to sides of heart

from ventricle to atrium/between atrium and ventricle [2]

[Total: 8]

6 **(a)** **R** – oviduct/fallopian tube; (A – ovary duct)
S – vagina; [2]

(b) **(i)** label **F** linked to oviduct; [1]

(ii) label **I** linked to uterus; [1]

(i) limits – from start of oviduct funnel to where oviduct begins to widen into uterus
(ii) limits – from where oviduct starts to widen to the cervix
A – label line to wall or cavity
if no label line whole of letter to be within designated area

(c) **(i)** oestrogen; (A – phonetic spellings)
ovary; [2]

(ii) breasts/mammary glands;
R – refs to reproductive organs shown in Fig. 6.1
I – refs to behavioural features
widening of hips;
pubic/axillary hair/OWTTE;
rounding of outline/subcutaneous fat layer;
ref. to release of other sex hormones by pituitary gland;

any two – 1 mark each [2]

[Total: 8]

7 **(a)** **(i)** recessive (allele);
beware **(a)(i)** and **(a)(ii)** are the same clip [1]

(ii) child 8 shows NPS but neither parent (6 and 7) shows it;
must indicate both parents
I – refers to skipping a generation

thus allele for NPS present in parents/are carriers;
candidates may think NPS is an infection/disease and thus accept use of this terminology e.g. child 8 has disease but her parents do not

but latent/not expressed;

any two – 1 mark each [2]

(b) parents must be heterozygous;
child must inherit recessive from both parents;

could gain all marks with labelled diagram
accept any letters chosen as symbols but must follow normal convention, but beware use of X and Y that it is not a sex determination cross

next child 25%/1 in 4/1 to 3 chance;
beware extra statements that negate the 25% chance [3]

[Total: 6]

8 **(a)** (following sewage release) bacteria population rises;
downstream/later on it falls; [2]

please remember that **(a)** is a description and **(b)** is an explanation and not transfer points from the latter to the former

(b) (large number of) bacteria present in sewage;
bacteria feed on materials in the sewage;
bacteria reproduce/population increases/numbers go up;
I – bacteria grow
(downstream) sewage/organic remains all broken down/food runs out;
therefore bacteria die/decrease in numbers;
A – in context
I – refs to any dilution effect

any four – 1 mark each [4]

[Total: 6]

9 **(a)** **(i)** (killer) whale; [1]

(ii) (Adelie) penguin; [1]

(b) (algae) → krill → (Adelie) penguin;
→ Leopard seal → killer whale;

(algae) → krill → fish;
→ (Adelie) penguin → Leopard seal;

(algae) → krill → squid;
→ Ross seal → Leopard seal;

any one chain, first two links correct;
other 2 links correct; [2]

(c) (i) because less Ross seals/food for Leopard seal;
A – explanation based on Leopard seals eating more/only penguins and thus population only falling a little or not at all
population falls; [2]

(ii) **A** less Ross seal eating squid;
squid population rises;
squid eat more krill;
causes fall in krill population;
less food for fish;
fish population falls;

OR

B less Ross seals as food for Leopard seals;
Leopard seal population falls;
less Adelie penguins eaten;
Adelie penguin population rises;
more fish eaten by Adelie penguins;
fish population falls;

OR

C less Ross seals as food for Leopard seals;
Leopard seals eat more Adelie penguins;
so Leopard seal population stays the same;
Adelie penguin population falls;
so less fish eaten by Adelie penguins;
fish population rises;

OR

D less Ross seals as food for Leopard seals;
Leopard seals eat more Adelie penguins;
Adelie penguin population falls;
so less krill eaten by Adelie penguins;
so more food for fish;
fish population rises;

any four – 1 mark each [4]

prediction of rise or fall of fish population – 1 mark
can gain this without any further explanation
no prediction of rise or fall of fish population – MAX 2 for logical sequence in explanation
rest of explanation must be supporting evidence for their prediction to gain further marks
if there is a mix of 2 different explanations give mark consistent with the best single explanation

[Total: 10]

10 (a) keeping conditions/factors within body/cell/internal environment;
need definition
I – specific examples

constant/within narrow limits/steady; [2]

(b) size of pupil/iris altered/OWTTE;
ref to contraction/relaxation of iris muscles/OWTTE;
attempts to keep amount of light reaching retina constant/OWTTE;
I – light entering eye
constant context needed
I – protection of the eye [3]

[Total: 5]

11 (a) **X** – vena cava; (beware renal vein)
Y – ureter;
Z – urethra; [3]

(b) fall in oxygen because of respiration;
fall in glucose because of respiration;
urea/(sodium) salts/water filtered out;
urea not reabsorbed;
water (sodium) salts partially reabsorbed;
A – selectively/variable reabsorption/ not all reabsorbed

any three – 1 mark each [3]
no marks for repeating data in table

[Total: 6]