

## **MARK SCHEME for the May/June 2008 question paper**

### **0610 BIOLOGY**

**0610/02**

Paper 2 (Core Theory), maximum raw mark 80

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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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- 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 1<sup>st</sup> space: small;  
2<sup>nd</sup> space: dull;  
3<sup>rd</sup> and 4<sup>th</sup> spaces: light; dry; (in either order)  
5<sup>th</sup> and 6<sup>th</sup> spaces: stamens; style; (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
( <i>starch</i> )	amylase/ptyalin carbohydrase;	( <i>simple sugars</i> )
protein;	protease/pepsin/ trypsin;	( <i>amino acids</i> )
( <i>fat</i> )	( <i>lipase</i> )	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]

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- 4 (a) (i) carbon dioxide/CO<sub>2</sub>;  
water/H<sub>2</sub>O;  
R – sunlight/light [2]
- (ii) oxygen/O<sub>2</sub>; [1]
- (b) (i) iodine/potassium iodide (solution);  
mark (b)(i) and (b)(ii) independently. [1]

(ii)

area	colour
<b>A</b>	brown colour;
<b>B</b>	brown colour;
<b>C</b>	black colour;
<b>D</b>	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]**

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

(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) [2]  
ovary;

(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); [1]  
beware (a)(i) and (a)(ii) are the same clip

(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]**

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- 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]

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(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]**

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- 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]**