UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2007 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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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International Examinations

General notes

Symbols used in mark scheme and guidance notes

/ separates alternatives for a marking point

; separates points for the award of a mark

MP in guidance refers to numbered mark point

ORA or reverse argument/reasoning

OWTTE or words to that effect

R reject

I ignore/irrelevant

1 nutrition;
excretion;
respiration;
movement; [4]

[Total: 4]

Guidance

Accept these words only.
Accept spelling errors.

2 **(a)** **(i)** first 2 years/first 2 year period/0–2 years old; [1]

(ii) accurate plotting of 4 points;
accurate plotting of other 3 points;
points joined appropriately;
"male" curve identified;
Any three – 1 mark each [3]

(iii) 9;
17; [2]

(b) **(i)** females/girls/women; [1]

(ii) breaking/deepening of voice;
growth/development of pubic hair;
growth development of axillary hair/facial/thoracic hair;
broadening/widening of shoulder girdle;
more/greater muscle development;
production of semen/sperm;
more "aggressive" behaviour/OWTTE;
Any three – 1 mark each [3]

(iii) testosterone; [1]

(iv) puberty [1]

[Total: 12]

Guidance

(a) **(iii)** in both cases refer to candidate's graph.

(b) **(ii)** R – refs to changes in females.

(b) **(vi)** R – adolescence.

3 **(a)** **(i)** 1 transfer of oxygen from mother's blood to fetal blood;
2 carbon dioxide from fetus to mother;
3 urea from fetus to mother;
4 acts as barrier to bacteria/toxins drugs;
5 production of progesterone;
Any two – 1 mark each [2]

(ii) increase surface area/area in contact;
increases diffusion; [2]

(b) **X** placed close to surface of villi; [1]

(c) 1 (allows) large difference in pressure between two (blood) systems;
2 bloods could be of different blood groups;
3 reduces risk of transfer of pathogens/correct named example;
4 reduces risk of transfer of toxic materials/drugs;
5 allows bloods to have different compositions/red blood cells;
Any three – 1 mark each [3]

[Total: 8]

Guidance

(a) **(i)** MP4 I – ref to viruses.

(c) MP 3 and 4 R – stops transfer.

4 **(a)** immediately after discharge oxygen concentration falls;
after low level it gradually rises (downstream);
rise is slower than fall/ORA;
Any two – 1 mark each [2]

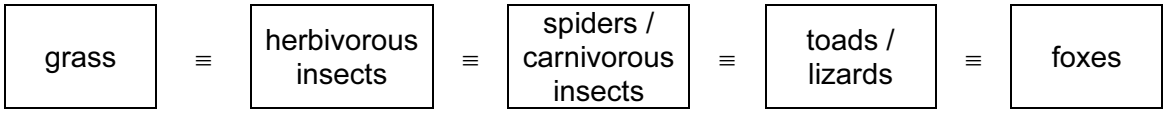
(b) 1 bacteria present in sewage/river;
2 sewage contains lots of organic material;
3 acts as food for/broken down by bacteria;
4 that rapidly reproduce/grow in numbers;
5 (bacteria) use oxygen for respiration;
6 river becomes anaerobic;
7 oxygen enters from atmosphere;
8 plants add oxygen from photosynthesis;
Any four – 1 mark each [4]

[Total: 6]

Guidance

(b) MAX 3 marks from MP 1 – 6

5 (a) (i)



[1]

(ii) consumer
Any two animals in web;
carnivore
Any two from – carnivorous insect, spider, fox, toad, lizard, stoat, kestrel;
herbivore
Any two – from herbivorous insect, vole, rabbit;
Each correct column – 1 mark [3]

(b) * 1 stoat population could rise;
2 as kestrels eat less voles;
3 more food/voles for stoats;
* 4 (if more stoats then) population of rabbits fall;
5 as stoats eat more of them;
6 more voles would eat more grass;
7 less food for rabbits (population falls);
Any four – 1 mark each [4]

(c) (i) 1 foxes/kestrel/top carnivore; [1]
2 plants absorb radioactive minerals/ions/chemicals;
3 taken in by herbivores within plants/on plants;
4 passed to carnivore;
5 at each stage predator eats lots of prey individuals;
6 (bio)accumulation occurs;
Any two – 1 mark each [2]

(ii) bones and teeth/where there are high levels of calcium; [1]

[Total: 12]

Guidance

(b) 1 mark for each of two predictions (*).
1 mark for each of two suitable explanatory points.

6 **(a)** **A** – epidermis/epidermal cell; **B** – cuticle; [2]

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

(ii) a stoma correctly labelled; [1]

(iii)

	movement of gas or vapour			reason for movement of gas or vapour
	into leaf	out of leaf	none	
carbon dioxide	T			for use in photosynthesis/OWTTE;
oxygen		T		product of photosynthesis/OWTTE;
water vapour		T		transpiration/OWTTE;

Each correct row – 1 mark each [3]

(iii) slow down/stop leaving leaf; [1]

(c) xylem position identified by label;
correctly named; [2]

[Total 10]

Guidance

(b) **(ii)** Accept label line to guard cell or pore.

(b) **(iii)** MP 1 and 2 if reason is that diffusion occurs in both directions at the same time then give credit for T in both in and out columns.
Ψ = blank.

7 **(a)** 1 yeast;
2 ferments;
3 sugars/glucose;
4 anaerobically/in absence of oxygen;
5 forms alcohol/ethanol;
Any three – 1 mark each [3]

(b) 1 slows nerve impulses;
2 impairs judgment;
3 reduces inhibitions/is a depressant;
4 is addictive;
5 damages/kills brain cells;
6 causes cirrhosis of liver/damages/kills liver cells;
7 can cause stomach ulcers;
8 may increase risk of certain cancers;
Any three – 1 mark each [3]

[Total: 6]

Guidance

(a) If equation, word or symbol, given credit for MP 3 and 5 only.
No credit for ref. to carbon dioxide.

(b) MP8 R – wrongly named cancer.

8 (a) (i) **A** – aorta; **B** – pulmonary vein [2]

(ii) bicuspid valve;
prevent backflow of blood (into left atrium); [2]

(b) (i) 7 dm^3/doubles in volume/100%; [1]

(ii) 1 exercise needs extra energy;
2 increases respiration in muscle (cells);
3 increased delivery of oxygen;
4 increased delivery of glucose;
5 increased removal of carbon dioxide;
6 increased removal of heat;
7 reduces risk of depending on anaerobic respiration;
8 removes any lactic acid that is produced;
Any four – 1 mark each [4]

(c) (i) heart muscle (beyond blockage) loses supply of oxygen/glucose;
(in this region) muscle cells die;
correct ref. to heart attack/effect on heart beat;
Any two – 1 mark each [2]

(ii) reduce intake of (animal/saturated) fats/cholesterol;
stop/reduce smoking/carbon monoxide intake;
reduce stress;
take exercise;
Any two – 1 mark each [2]

[Total: 13]

Guidance

(b) (ii) MP3, 4, 5, 6 ref to “increased” only needed once

9 **(a)** **(i)** F; [1]

(ii) D; [1]

(iii) E; [1]

(iv) G; [1]

(b) provides optimum pH for stomach enzymes/protease;
kills bacteria swallowed with food;
coagulates milk protein;
Any two – 1 mark each [2]

(c) 1 liver stores excess sugar/glucose;
2 as glycogen;
3 destroys excess amino acids;
4 changes them to urea;
5 produces bile;
6 emulsifies fats/description;
Any three – 1 mark each [3]

[Total: 9]

Guidance

(a)(i)–(iv) more than 1 letter then no mark