

**CAMBRIDGE**  
INTERNATIONAL EXAMINATIONS

**NOVEMBER 2002**

**INTERNATIONAL GCSE**

<b>MARK SCHEME</b>
<b>MAXIMUM MARK : 70</b>
<b>SYLLABUS/COMPONENT : 0610/2</b> <b>BIOLOGY</b> <b>(CORE)</b>



UNIVERSITY of CAMBRIDGE  
Local Examinations Syndicate

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Table 1.1

fish											name of fish	
	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b		
A												
B	✓		✓					✓				Hake;
C	✓		✓				✓					Bearded Rockling;
D		✓				✓						Greenland shark;
E	✓			✓							✓	John Dory;
F	✓			✓					✓			Sea Bream;

All ticks and name correct in a row for award of mark

[5]

[Total: 5]

- 2 (a) left ventricle; [1]
- (b) (i) untrained person at rest – 5.25;  
trained person at rest – 5.25; [2]
- (ii) reduces the heart rate;  
increases the stroke volume; [2]
- (iii) EITHER  
(untrained person) has a higher heart rate / smaller stroke volume / smaller cardiac output / ORA; [from comparison of both at maximum exercise]  
OR  
(untrained person) has smaller increase in heart rate / in stroke volume / in cardiac output / ORA; [from comparison of both between rest and max.exercise]  
illustrated with use of figures;  
(e.g. for cardiac output - untrained x4, trained x6 or untrained by 16.2, trained by 24.45: for stroke volume – increase by 50%) [2]
- (iv) heart does not have to contract so frequently / increases strength of muscle / reduces risk of heart disease / more efficient; [1]

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- (c) to increase / more;  
 (delivery of) oxygen / glucose;  
 to active muscles;  
 for respiration / obtain / release energy;  
 removal of carbon dioxide / heat;  
 reduce need for anaerobic respiration / no / little lactic acid produced / oxygen debt;

Any four – 1 mark each

[4]

[Total 12]

- 3 (a) treated sewage can be rich in nitrates / phosphates;  
 produced from the treatment process / breakdown of sewage / organic matter;  
 may contain detergents (phosphates) / waste from chemical industries (nitrates / phosphates);

Any two – 1 mark each

[2]

- (b) (nitrates / phosphates) cause algal growth / bloom / eutrophication;  
 reduces light to submerged plants / prevents photosynthesis;  
 algae / plants die;  
 bacterial food source / broken down by bacteria;  
 bacterial in sewage water / bacteria multiply;  
 use up oxygen / bacterial respiration;  
 death of other organisms (due to lack of oxygen / food) / migration from region;  
 animals tolerant of low oxygen survive / flourish;

Any five – 1 mark each

[5]

[Total: 7]

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- 4 (a) (i) M – 3800;  
N – 80; [2]
- (ii) decomposers / bacteria / fungi / saprophytes / omnivores / detritivores / scavengers; [1]
- (iii) sun / sun(light); R – light [1]
- (iv) respiration;  
excretion;  
egestion / leaf fall;  
heat loss / transpiration / sweating / radiation;  
Any two – 1 mark each [2]
- (b) respiration is much more rapid;  
because of higher metabolic rate;  
(energy needed) to move;  
have higher body temperature than environment / constant body temperature;  
heat loss to environment;  
Any two – 1 mark each [2]
- [Total: 8]
- 5 (a) (i) correct plotting;  
points joined and curve labelled; [2]
- (ii) 0 – 2 years old; [1]
- (iii) 8.5 – 16 years; Check against candidate's graph [1]
- (iv) 15 (years); [1]

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- (b) (start of) menstrual cycle menstruation / periods;  
(start of) ovulation;  
development of breasts / mammary glands;  
widening / growing of hips;  
growth of pubic hair / axillary hair;  
sex organs mature / enlarge;  
subcutaneous fat (qualified);  
Any three – 1 mark each

[3]

[Total 8]

- 6 (a) A – penis/ erectile tissue;  
B – sperm duct / tube / vas deferens;  
C – urethra;

[3]

- (b) (i) inflammation of urethra;  
greeny-yellow discharge from penis;  
burning sensation / pain when urinating;  
Any two – 1 mark each

[2]

- (ii) blockage of sperm duct / sterility / infertility;  
may lead to infection of prostate / difficulty in urinating;  
Any one – 1 mark

[1]

- (iii) use of antibiotics / penicillin;

[1]

- (iv) use of condoms;

[1]

Total [8]

- 7 (a) (i) a group of similar cells performing the same job; [1]
- (ii) support;  
transport of water / mineral salts; R – uptake, storage [2]
- (b) (i) ciliated epithelium; [1]
- (ii) push / move egg cell (down oviduct / towards uterus); I - carry [1]
- (iii) trachea / windpipe / bronchus / bronchiole; [1]
- (iv) nicotine; [1]

[Total: 7]

8 (a) (i)

	water volume (cm <sup>3</sup> )	
	cylinder A	cylinder B
original volume	70	70
final volume	55;	45;

(1 mark for each column of figures) [2]

- (ii) the number leaves / amount of surface area; [1]
- (iii) place a layer of oil on the water surface to stop evaporation / other suitable method e.g. use of split cork; [1]

(b) air speed / air movement / wind;

temperature;

humidity;

(sun) light / light intensity;

Any three – 1 mark each

[3]

[Total: 7]

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- 9 (a) (i) protease / named protease; [1]
- (ii) acidic conditions in the stomach but alkaline in small intestine; [1]
- (b) (i) stored in liver / muscle; [1]
- (ii) stored as glycogen; [1]
- (c) deamination / breakdown of amino acids (into ammonia / ammonium);  
urea formed / ammonia combined with carbon dioxide;  
occurs in liver;  
(urea) carried in blood (plasma / vessels / system);  
(urea) to kidneys;  
(urea) filtered from blood / removed in urine;
- Any four – 1 mark each [4]

[Total 8]