

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
GCE Ordinary Level

**MARK SCHEME for the October/November 2010 question paper
for the guidance of teachers**

5096 HUMAN AND SOCIAL BIOLOGY

5096/21

Paper 2 (Theory), maximum raw mark 100

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, which would have considered the acceptability of alternative answers.

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Page 2	Mark Scheme: Teachers' version	Syllabus
	GCE O LEVEL – October/November 2010	5096

- 1 (a) (i) Plasmodium ;
- (ii) protoctists / protists / protozoa ;
- (b) (i) capillary ; [1]
red (blood cell) ; [1]
- (ii) asexual / vegetative / (multiple) fission ; [1]
- (iii) any two from: excessive sweating or fever, shivering, headache, aching limbs, possible symptom related to red blood cell destruction ;; [2]
- (c) Stage A: any two from –
insecticide ; + kills larvae / pupae ;
oil ; + prevents breathing of larvae / pupae ;
fish ; + eat larvae / pupae ;
drainage / covering tanks etc. ; + no breeding grounds ;
- Stage B: any two from –
insect repellent ; + deters adults AW ;
cover arms and legs ; + prevent biting ;
nets / screens ; + adults active at night / stop them entering buildings ;
insecticides / coils ; + kills adults ;
- Stage C: drug / named drug / vaccination ; + kills parasite / stimulates active immunity (for vaccination) ; [max 10]
- (d) (water-borne) + bacteria ;
killed by heat / boiling ;
larvae / pupae do not carry parasite ;
parasite does not enter via digestive system ; [max 3]
- [Total: 20]

- 2 key / explanation of symbols ;
parents ; Aa × Aa ;
- A a A a
+ correct tie-up ;
- AA Aa (Aa) aa
|
identified as sufferer ; [max 4]
- [Total: 4]

Page 3	Mark Scheme: Teachers' version	Syllabus
	GCE O LEVEL – October/November 2010	5096

- 3 (a) bacterium ;
- (b) (e.g.) tuberculosis + streptomycin ;
(A ciprofloxacin for gonorrhoea / any linked disease + antibiotic)
- (c) (i) no longer effective / bacteria resistant AW ;
- (ii) different antibiotic ; [2]
- [Total: 4]
- 4 (a) protracted / prolonged use ;
cannot do without / craving AW ; [2]
- (b) emotional problems AW ;
liver disease / cirrhosis ; [2]
- (c) slower reaction times ;
faulty judgement / risk-taking ;
reduced concentration ;
aggressive behaviour ; [max 2]
- [Total: 6]
- 5 (a) protein ; [1]
- (b) vitamin C – ref. needed for tissue / skin production ;
vitamin D – promotes uptake of calcium ;
calcium – manufacture of bones / teeth ;
any correct reference to the fetus / baby ; [4]
- (c) bones harden / develop further after birth AW / top-up own Ca ; [1]
- [Total: 6]
- 6 (a) homeostasis / negative feedback ; [1]
- (b) E – insulin ;
F – glycogen ;
G – glucagon / adrenaline ; [3]
- (c) pancreas / islets of Langerhans ; [1]
- [Total: 5]

Page 4	Mark Scheme: Teachers' version	Syllabus
	GCE O LEVEL – October/November 2010	5096

7 (a) $\frac{3500}{\text{cm}^3}$;

(b) internal intercostals + contract ;
external intercostals + relax ;
diaphragm + relax ;
abdominal muscles + contract ;

[max 3]

(c) within 1500 and 5000 ;
'waves' closer together ;
greater amplitude than at rest ;

[max 2]

(d) (mark independently from (c))
more oxygen ;
for muscles ;
energy release / oxygen debt ;
from respiration ;
ref. CO₂ expulsion ;

[max 3]

[Total: 10]

8 (a) cartilage flexible + bone rigid ;
more protein / collagen in cartilage ;
fewer salts / less Ca₃(PO₄)₂ ;
more slippery / AW ;
gelatinous / softer ;

[max 4]

(b) any two named types of joint ;
ref ligaments ;
holding bone to bone at joint ;
maintenance of low friction ;
muscles attached ;
flexors ;
extensors ;
ref. origins ;
insertions ;
tendons ;
transmit force of muscles to the bones ;
when they contract ;
bones act as levers ;
in contact with the substrate / ground ;

[max 11]

[Total: 15]

Page 5	Mark Scheme: Teachers' version	Syllabus
	GCE O LEVEL – October/November 2010	5096

- 9 (a) filtration ;
of / from blood ;
homeostasis ;
excretion ;
of urea ;
salts ;
poisons / toxins ;
broken-down hormones ;
adjusts / keeps constant concentration of plasma / blood maintenance of water
level of plasma / blood ;

[max 7]

- (b) (i) more protein (or reverse argument) ;
more deamination in liver / or described (ora) ;
more urea (ora) ;
more salts in diet more have to be removed (ora) ;
more water consumed more has to be removed (ora) ;
to maintain blood concentration ;

[max 4]

- (ii) affects amount of sweating ;
affecting amount of water lost ;
during temperature regulation ;
affects amount of water released in urine ;
ref. loss of salts in sweat ;
adjustment of salts in urine ;
to maintain blood concentration ;

[max 4]

[Total: 15]

Page 6	Mark Scheme: Teachers' version	Syllabus
	GCE O LEVEL – October/November 2010	5096

10 Either

- (a) washing hands ;
 ref. faecal contamination ;
 ref intestinal infection or one named ;
 faeces ;
 bacteria / viruses ;
 transmitted to mouth ;
 ref. food handling ;
 faeces attract flies ;
 collect bacteria on legs ;
 visit uncovered food ;
 vomit remains of last meal on next one ;
 urine + may contain eggs of blood fluke ;
 ref. unpleasant odour ;

[max 9]

- (b) (i) destruction of all living microorganisms or named ;
 in / on an object ;
 to avoid contamination / disease transfer ;
- (ii) chlorine / ethylene oxide / ozone / H_2O_2 ;
 e.g. public swimming pools / drinking water ;
 can be used on plastics that are not heat resistant ;
 e.g. on medical equipment ;

[max 6]

[Total: 15]**10 Or**

- (a) attracts flies ;
 collect bacteria on legs ;
 visit uncovered food ;
 vomit remains of last meal on next one ;
 suitable conditions for breeding ; (max 4)
 attracts vermin ;
 vectors of disease ;
- (b) screen removes larger object / paper etc. ;
 sedimentation removes grit / sand ;
 remaining solids form sludge ;
 worked on by bacteria / protoctists / fungi ;
 break down organic materials ;
 to mineral salts ;
 activated sludge / trickling filter method ;
 large surface area provided by bubbles / clinker beds ;
 aeration / oxidation ;
 finally the settling tanks ;
 water returned to water courses ;
 remaining sludge dumped at sea ;
 ref. biogas / manure by-products ;

[max 5]

[max 10]

[Total: 15]