

**MARK SCHEME for the October/November 2009 question paper
for the guidance of teachers**

5096 HUMAN AND SOCIAL BIOLOGY

5096/02

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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- 1 (a) (i) B, C, D; mark first three
- (ii) A, E, F; mark first three [6]
- (b) G = right atrium/auricle;
H = left atrium;
I = left ventricle; [3]
- (c) A/coronary artery; [1]
- (d) thick walls;
muscular (tissue);
elastic (tissue); [3]
- (e) 120 = systolic pressure/when ventricle contracts/maximum pressure;
80 = diastolic pressure/when ventricle relaxes/minimum pressure; [2]
- (f) (i) kidneys; gut; [2]
- (ii) 4 times; [1]
- (g) muscles squeeze veins/raises blood pressure;
valves direct flow to heart/prevent backflow; [2]
- [Total: 20]**
- 2 (a) absent; present;
absent; present; [4]
- (b) boil; with equal volume; of Benedict's solution; red/brown/green/orange; precipitate (shows sugar) [max. 4]
- [Total: 8]**
- 3 (a) 1. more sweat produced;
2. vasodilation/more blood in capillary loop/loop wider; [2]
- (b) sweat evaporates; takes latent heat; from skin/blood; (max. 2)
more blood closer to surface; more heat lost by radiation; conduction; convection. (max. 2) [4]
- [Total: 6]**

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4 (a) four label-lines and labels correct; [4]

(b) living bone can grow; can heal/repair; [2]

[Total: 6]

5 J to ovary;
K to oviduct or funnel;
L to urethra;
M to uterus;
N to ovary; [5]

[Total: 5]

6 lymphocytes; antibodies; serum; passive; short. [5]

[Total: 5]

7 (a) (i) edge (of retina);
(ii) fovea; [2]

(b) blind spot; [1]

(c) (i) iris;
(ii) ciliary muscle/body; [2]

[Total: 5]

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Section B

- 8 (a)** reagent; solvent; transport medium; constituent of cytoplasm/body fluids; lubrication (e.g. peristalsis) [4]
- (b)**
- (i) blood arrives in arteriole/under pressure;
 - (ii) filtered;
 - (iii) at glomerulus;
 - (iv) into Bowman's capsule;
 - (v) most/80+%;
 - (vi) water reabsorbed at PCT;
 - (vii) by osmosis;
 - (viii) some at loop of Henle;
 - (ix) also at DCT/ collecting duct;
 - (x) in all 99% reabsorbed;
 - (xi) rest into ureter; [7]
- (c)**
- (i) water shortage/high blood conc. read at hypothalamus/brain;
 - (ii) pituitary gland;
 - (iii) releases (more) ADH;
 - (iv) ADH passes to kidney in blood;
 - (v) makes DCT/collecting duct more permeable;
 - (vi) so more water reabsorbed;
 - (vii) from urine/into blood; [4]

[Total: 15]

Page 5	Mark Scheme: Teachers' version	Syllabus	Paper
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- 9
- (i) overcrowding can encourage spread of disease;
 - (ii) suitable example such as TB/ringworm/influenza;
 - (iii) latrine close to shallow well;
 - (iv) danger of disease spreading to water;
 - (v) after rain/in flooding;
 - (vi) suitable bacterial example;
 - (vii) suitable fluke/worm disease;
 - (viii) shallow well easily infected /water not filtered;
 - (ix) animals below house can harbour diseases;
 - (x) e.g. tapeworm;
 - (xi) wet ground can hatch larvae of fluke/worm/Bilharzia (Schistosomiasis);
 - (xii) wet ground spread Tinea;
 - (xiii) long grass harbours mosquito adults;
 - (xiv) spread malaria/other named diseases (when they bite);
 - (xv) stagnant water breeding ground for mosquitoes;
 - (xvi) also for snails;
 - (xvii) snails carry Bilharzia (Schistosomiasis) larvae/reproduce larvae;
 - (xviii) infect people entering water;
 - (xix) manure heap attracts flies;
 - (xx) flies spread cholera/typhoid;
 - (xxi) onto food in house;
 - (xxii) attracts rats;
 - (xxiii) rats spread disease;
 - (xxiv) e.g. Weil's;

[Total: 15]

Page 6	Mark Scheme: Teachers' version	Syllabus	Paper
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10 Either

(a) Liver; Brain; A heart/stomach [2]

- (b) (i) alcohol slows passage of impulses;
(ii) and synaptic transmission;
(iii) so reactions slowed;
(iv) especially decision making;
(v) e.g. braking time increased;
(vi) coordination affected;
(vii) vision affected/double vision;
(viii) become overconfident/judgement affected;
(ix) become aggressive;
(x) may be sleepy; [7]

(c) alcohol affects brain; so person feels he must have it; may need increasing amounts to get same effect. [2]

- (d) (i) subject attempts to catch ruler as soon as it is dropped;
(ii) read off length of ruler that projects below hand/above hand;
(iii) idea of repeats and averaging results;
(iv) get subject to drink alcohol;
(v) wait for effect to take place;
(vi) repeat experiment;
(vii) compare lengths obtained before/after intake of alcohol; [4]

[Total: 15]

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10 Or

(a) Cancer of lung; of mouth/tongue/throat/heart disease/chronic bronchitis/emphysema/addiction;
mark first two [2]

(b) (i) Smoke contains nicotine;
(ii) nicotine constricts vessels/arterioles R capillaries;
(iii) in placenta;
(iv) so less passage of nutrients/oxygen;
(v) carbon monoxide;
(vi) destroys/poisons Hb/ AW.;
(vii) so maternal blood carries less oxygen;
(viii) less oxygen to foetus;
(ix) less respiration;
(x) less energy;
(xi) for growth; [7]

(c) largest volume of air; that can be exchanged (by lungs); or largest volume you can take in;
after deepest exhalation. [2]

(d) (i) Compare two groups of people – i.e. numbers involved;
(ii) of comparable size/age/weight – some attempt to make test fair;
(iii) get each to exhale as deeply as possible;
(iv) into tube;
(iv) after inhaling fully;
(v) air pushes water out of jar;
(vi) read off volume of air in jar for each;
(vii) compare results between groups/compare averages; [4]

[Total: 15]