

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

### **5096 HUMAN AND SOCIAL BIOLOGY**

**5096/02**

Paper 2 (Theory), maximum raw mark 100

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**Section A**

- 1 (a) labels to correct parts of root cell;;;
- (b) (i) no nucleus/no named organelles/smaller;
- (ii) has cell wall/cytoplasm/membrane, etc.; [2]
- (c) bone cell/osteoblast/osteocyte;  
cone; **R** rod/iris  
rbc/erythrocyte;  
sperm/egg or ovum/gamete/sex cell; [4]
- (d) **A** = muscle/triceps;  
**B** = bone/humerus;  
**C** = ligament/joint capsule;  
**D** = cartilage;  
**E** = tendon/biceps tendon; **R** muscle/biceps [5]
- (e) (i) **C**; *letters only here*
- (ii) **A**;
- (iii) **E**;
- (iv) **D**; [4]
- (f) (i) respiration/energy release;
- (ii) **A**; [2]
- [Total: 20]**
- 2 (a) 3 points plotted;;; line to join them; [4]
- (b) 36–40 weeks/last 4 weeks/anywhere within, e.g. 38; [1]
- (c) 4.0 to 5.0 1 mark for graph extension; 1 mark for numerical answer; [2]
- [Total: 7]**
- 3 (a) water entered; by osmosis; water more dilute than cytoplasm/cytoplasm more concentrated than water/correct ref to water potential; cells burst; [Max. 3]
- (b) water lost; by osmosis/exosmosis; cells shrunken; [Max. 2]
- [Total: 5]**

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- 4 (a) uptake (by plants); denitrification;
- (b) (i) lower/reduce it;
- (ii) flooding lowers oxygen levels/gives anaerobic conditions; water fills air spaces in soil; less oxygen dissolved in water than present in air; so less nitrification; less decay; more denitrification; dilution; [Max. 3]
- [Total: 6]

- 5 (a) M to cornified layer/A hair;  
N to a receptor;  
O to malphigian layer/hair follicle;  
P to sweat gland;  
Q to arteriole; [5]
- (b) (i) to sensory neurone; *not receptor endings*
- (ii) to the motor; *not end plates.* [2]
- [Total: 7]

- 6 (a) fish has less fat/A has more calcium; [1]
- (b) (i) potatoes;
- (ii) eggs; [2]
- (c) rice has more energy; more protein; *ignore refs to carbohydrates/fats* [2]
- [Total: 5]

- 7 (a) plasma cells; memory cells; [2]
- (b) mitosis; [1]
- (c) memory cells; [1]
- (d) to make antibodies; R contains antibodies [1]
- [Total: 5]

[Section A = 55]

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Section B

8 (a) cholera

bacterium/Vibrio;  
 via drinking; water;  
 contaminated by faeces;  
 via food;  
 infected by flies/dirty hands;  
  
 lives in gut/intestine;  
  
 profuse, watery diarrhoea/  
 'rice waterstools';  
 dehydration;  
 fever/feels hot/sweats;  
 cramps; **R vomiting**

schistosomiasis

flatworm/fluke/worm;  
 by drinking; or swimming/paddling;  
 in water;  
 contaminated by faeces/urine;  
 larvae; bores through skin/buccal lining;  
  
 in blood vessels of gut/bladder;  
  
 blood in faeces/urine;  
 ulceration of gut/bladder;  
 liver damage;  
 anaemia;

[Max. 10]

(b) UV light kills some bacteria (in reservoir);

particles sediment;  
 bacteria filtered at **S**; *this and next 5 items must be tied to S as a filter*  
 through sand;  
 covered with mucilage layer;  
 full of protozoa/insect larvae;  
 which eat bacteria;  
 chemicals may be added to flocculate/precipitate the bacteria (for faster filtration);  
chlorine added to water;  
 stored in closed tanks;  
 chlorine destroys/kills all bacteria/viruses **A** germs;

[Max. 5]

9 (a) **F** = hepatic vein;

**G** = hepatic artery;

**H** = hepatic portal vein/portal vein;

[3]

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- (b) liver makes bile;  
bile alkaline;  
helps to neutralise acidity from stomach/chyme/raise pH;  
makes pH suitable for named enzymes here;  
emulsifies fats; **R** *breaks down fats*  
which speeds lipase action;  
stimulates peristalsis;

[Max. 3]

- (c) insulin;  
when glucose levels high;  
makes liver cells take up glucose (from blood);  
some respired;  
some converted to glycogen;  
stored in liver (cells);  
some to fat;  
so blood glucose falls;  
glucagon;  
when glucose levels low;  
stimulates conversion of glycogen to glucose (in cells);  
glucose released to blood;  
adrenaline;  
stimulates conversion of glycogen to glucose;  
quickly/in emergency;  
so blood levels rise;

[Max. 9]

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10 Either

(a) antiseptics are man-made chemicals; **R** *chemicals solus* cannot be taken internally/used on body surface; or on utensils/working surfaces; kills/stops growth of microbes; antibiotics made by microbes; can be taken internally; anti-microbial (bacteria/fungi); kill bacteria/fungi or stop growth of them; [Max. 4]

(b) to build high concentration of chemical in body; for long enough; to kill all microbes/bacteria/germs (so none remain); low concentration may allow survival of some; which may multiply; some may become resistant/change to stronger form; by mutation/genetic change implied; [Max. 4]

(c) resistance has occurred/bacteria have evolved; due to mutation; since early ones used widely (on animals)/indiscriminately; in animal foods; [Max. 2]

(d) prepare dish of nutrient agar/or broth; add bacterial solution; add paper disc soaked in new substance; incubate; at suitable temperature; for day or two; examine for signs of bacterial suppression at disc; [Max. 5]

also credit: 2 plates/flasks of broth; bacteria to both; suspected antibiotic to one; compare one with another;

10 or

(a) egestion is removal of faeces/undigested material; from gut/anus; material that has passed straight through gut/not entered blood, cells; excretion is removal of metabolic wastes/chemicals made inside cells; from the blood; e.g. urea/carbon dioxide; [Max. 4]

(b) faeces and/or urine; may contain pathogens; such as bacteria; or eggs of parasites; source of infection of others/may spread disease; either by direct contamination (of food/water); **R** *environment here* or via vectors/flies, etc; [Max. 4]

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(c) sugar + oxygen =;  
carbon dioxide + water + energy; **A symbols**

(d) blow into lime water;  
at rest;  
how? – via tube;  
take exercise;  
blow into lime water again;  
same volume;  
for same period;  
compare two solutions;  
degree of milkiness;  
suggestion how to measure amount of milkiness;  
or to same end point/milkiness;  
compare time taken to reach this;

[Max. 5]