UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

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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UNIVERSITY of CAMBRIDGE
International Examinations

Section A

1 **(a)** labels to correct parts of root cell;;; [3]

(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]

4 **(a)** uptake (by plants); denitrification; [2]

(b) **(i)** lower/reduce it; [1]

(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]

Section B

8 (a)

<u>cholera</u>	<u>schistososomiasis</u>
bacterium/Vibrio;	flatworm/fluke/worm;
via drinking; water; contaminated by faeces; via food; infected by flies/dirty hands;	by drinking; or swimming/paddling; in water; contaminated by faeces/urine; larvae; bores through skin/buccal lining;
lives in gut/intestine;	in <u>blood vessels of gut/bladder</u>;
profuse, watery diarrhoea/ 'rice waterstools'; dehydration; fever/feels hot/sweats; cramps; **R** *vomiting*	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);
<u>chlorine added</u> to water;
stored in closed tanks;
chlorine <u>destroys/kills</u> all bacteria/viruses **A** germs; [Max. 5]

9 (a) **F** = <u>hepatic vein</u>;
G = <u>hepatic artery</u>;
H = <u>hepatic portal vein/portal vein</u>; [3]

(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]

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]

(c) sugar + oxygen =;
carbon dioxide + water + energy; **A** *symbols* [2]

(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 <u>measure</u> amount of milkiness;
or to same end point/milkiness;
compare time taken to reach this; [Max. 5]