

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

5096 HUMAN AND SOCIAL BIOLOGY

5096/22

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	Paper
	GCE O LEVEL – October/November 2010	5096	22

1 (a) A ; [1]

(b) partially / selectively / semi + permeable ; [1]

(c) size ref. / small enough ;
to pass through gaps ;
by diffusion ;
water molecules ;
(by special case of diffusion) osmosis ;
ref. concentration gradient ;
random movement ; [max 6]

(d) glucose ;
salts / ions ;
urea ;
water ;
any from drugs / toxins / broken down hormones etc. ; [max 4]

(e) pressure ;
continuous flow ;
replacing molecules (continuously) ;
larger molecules passing ;
membrane more permeable ;
movement only in one direction ; [max 3]

(f) tubule ;
selective ;
(re)absorption ;
glucose / salts / amino acids ;
water ;
active transport ;
ref. to different parts of the tubule ; [max 5]

[Total: 20]

2 (a) diaphragm drawn immediately above stomach / liver ; [1]

(b) line to duodenum after entry of bile duct ; [1]

(c) lacteal / lymph ;
vein / vena cava ;
right atrium ; [3]

[Total: 5]

Page 3	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – October/November 2010	5096	22

3 (a) ball and socket ; [1]

(b) G – one tendon to radius ;
H – one tendon to scapula ; [2]

(c) M ;
it contracts to bend the joint ; [2]

[Total: 5]

4 (a) O – nucleus ;
P – (cell) membrane ; [2]

(b) strand of DNA ;
carrying genes ; [2]

(c) XX × XY
mother father ;
X X Y + gametes / named gametes ;

correct linking to show
XX XY ; [3]

[Total: 7]

5 (a) nitrogen ; [1]

(b) to make amino acids / proteins ;
for growth ; [2]

(c) bacteria (or named) ;
break down proteins ;
decay / decomposition / rotting / putrefaction ;
to amino acids ;
to ammonia / ammonium compounds ;
ref. nitrification ;
to nitrates ;
nitrogen fixation or described ;
ref. fertiliser / manure ; [max 4]

[Total: 7]

Page 4	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – October/November 2010	5096	22

6 (a) more, less, more, more, less ; [1]

(b) (i) sugars / sweets / fruit / vegetables / cereals ;

(ii) dairy / meat / eggs ; [2]

(c) (i) vitamin C ;

in vegetables / fruit ; [2]

(ii) fibre / roughage ;

in vegetables / fruit ;

to assist peristalsis AW ; [3]

[Total: 8]

7 (a) one cell compared to many / nerve is a bundle of neurones ; [1]

(b) motor ;

carries impulses to / connected to + effector / muscle **or** terminal cell body AW ; [2]

[Total: 3]

8 (a) (i) protein (coat) ;
surrounding (D/R)NA ;
non cellular / acellular ;
all pathogenic ;
sub microscopic AW ;

[max 2]

(ii) no nucleus ;

cell wall ;

saprotrophic / pathogenic / symbiotic ;

microscopic / size ref. ;

[max 2]

(iii) several nuclei ;

cell wall / chitin ;

all saprotrophic / parasitic / symbiotic ;

[max 2]

Page 5	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – October/November 2010	5096	22

- (b) eggs ;
laid in organic matter ;
larva / maggot ;
grows / moults ;
feeds ;
burrows into soil ;
pupa(tes) ;
adult / imago ;
feeds on faeces etc. ;
carry bacteria ;
to uncovered human food ;
vomits remains of last meal ;
named disease ;

[max 9]

[Total: 15]

- 9 (a) muscles involved ;
taking air into and out of ;
lungs ;
presenting O₂ to respiratory or gas exchange surface / alveoli ;
removing CO₂ ;
(respiration) release (R production) ;
of energy ;
from named substrate / glucose ;
in cells ;

[max 8]

- (b) (i) tilt patient's head ;
push down lower jaw ;
pinch patient's nose ;
blow / breathe into patient's mouth ;
repeat several times ;
- (ii) when person has stopped breathing ;
as determined by no chest movement / pulse ;
expired air contains 16 % O₂ ;
expansion / collapse of thorax stimulates heart ;

[max 7]

[Total: 15]

Page 6	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – October/November 2010	5096	22

10 Either

pill / oral ;
 reliable ;
 has to be remembered ;
 no protection against STIs ;
 cost ;
 condom / sheath / cap ;
 protection against STIs ;
 relatively cheap / easily obtainable ;
 has to be applied ;
 not entirely reliable / can split / desensitisation ;
 IUD / coil / loop ;
 reliable ;
 allows normal physiological rhythms ;
 has to be medically fitted / removed ;
 sterilisation ;
 tying oviducts ;
 vasectomy ;
 tying / cutting sperm ducts ;
 reliable ;
 requires surgical procedure ;
 permanent (in case of male) ;
 rhythm method ;
 addresses religious requirements ;
 ref. reliability ;
 cycle not regular ;
 (full marks can thus be scored for good accounts of 4 methods – there may also be acceptable points re. family planning)

[max 15]

[Total: 15]

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10 Or

chemical ;
 from industries ;
 named e.g. ;
 toxic ;
 kills plants ;
 thus no food for animals ;
 seeps into drinking water sources ;
 fertilisers ;
 washed from fields ;
 cause growth of water plants / eutrophication ;
 which die and are decayed ;
 by bacteria that use up O₂ ;
 no oxygen for water animals / fish ;
 insecticides / pesticides ;
 kill water insects ;
 build up in food chains ;
 can finish up in humans (from eating fish etc) ;
 sewage pollution ;
 ref. bacteria / flat worms ;
 bathing or drinking the water ;
 named disease ;
 oil ;
 damage to water birds ;
 blocks gills of fish (or some other piscine problem) ;

[max 15]

[Total: 15]