

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE O Level

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MARK SCHEME for the November 2005 question paper

5090 BIOLOGY

5090/02

Paper 2 maximum raw mark 80

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Page 1	Mark Scheme	Syllabus
	GCE O Level – November 2005	5090

Section A

- 1 (a) bacterium/named bacterium ; [1]
- (b) specific pH read from graph ;
- ref. to acid/low pH ;
- sours/curdles the milk ;
- flavours the cheese ; **[max. 3]**
- (c) stomach ;
- stomach is acidic/ref. HCl ;
- enzyme has optimum low pH AW ;
- young mammals consume only milk ;
- curdling increases surface area ; **[max. 2]**
- (d) (i) the use of vegetable oil/unsaturated fat ;
- (A v.v. for animal fat)
- (ii) Any two from: obesity or described, named circulatory ;
- disorder, dairy allergies ;: **[3]**
- [9]**
- 2 (a) A - alveolus/air sac ;
- B - **capillary** ;
- C – RBC/erythrocyte ; **[3]**
- (b) one mark each for statements 2 and 3, remove a mark for each ;
- incorrect ;: **[2]**
- (c) dissolves ;
- diffuses ;
- combines with haemoglobin/forms oxyhaemoglobin ;
- ref. any structure/substance which O₂ passes through ; **[max. 3]**
- (d) more oxygen in air breathed out ;
- Fe needed for haemoglobin ;
- less haemoglobin formed ;
- less oxygen absorbed by (red) blood (cells) ; **[max. 3]**
- [11]**

Page 2	Mark Scheme	Syllabus
	GCE O Level – November 2005	5090

- 3 (a) (i) chlorophyll ; ;
- (ii) magnesium ; ; [1]
- (b) (i) carbon dioxide/carbon(IV)oxide ; ;
- photosynthesis ; ; [2]
- (ii) supplied with oxygen ; ;
- for respiration ; ;
- waste product/carbon dioxide removed AW ; ;
- camouflage ; ;
- food/part of food chain AW ; ;
- importance in reproduction/eggs attached to leaves AW ; ;
- shade ; ; [max. 4]
- (c) animal/fish + no CCW/vacuole/chloroplasts ; ; [1]
- [9]
- 4 (a) pollution ; ; [1]
- (b) (i) carbon dioxide/carbon monoxide/sulphur dioxide/various
oxides of nitrogen (R symbols) ; ; [1]
- (ii) global warming AW/carboxyhaemoglobin AW/acid rain
(effect must be related to named gas) ; ; [1]
- (c) (i) Any two from: drainage from land, ion/salt/nutrients or
named, sewage, dung, warmer water ; ; [2]
- (ii) bacteria in sewage/cow dung ; ;
- decomposition AW ; ;
- oxygen used up ; ;
- bacteria + respiration ; ;
- animals/plants + unable to respire ; ; [max. 4]
- [9]
- 5 (a) (i) M - (inferior) **vena cava** ; ;
- N - (systemic) **aorta** ; ;
- O - pulmonary **vein** ; ; [3]

Page 3	Mark Scheme	Syllabus
	GCE O Level – November 2005	5090

- (ii) muscle ;
 - coronary + artery** ; [2]
 - (b) (i) semilunar valves correctly shown + label ;
 - (ii) & (iii) tricuspid correctly shown ;
 - bicuspid correctly shown ;
 - both correctly labelled ; [4]
 - (c) 1, 4, 2, 3. (3 if all correct, 2 if correct sequence, but starting in wrong place, 1 for any two in sequence) ;;; [3]
 - atrium contracts then ventricle contracts, forcing tcv closed and as pressure builds up, slv open
- [12]

The **maximum** mark for Section A is **50**

Section B

- 6 ref. in either (a) or (b) to reflex action ;
- neurones/impulses ;
- (a) **ciliary** ;
- muscles + relax** ;
- (suspensory) ligaments ;
- tighten AW ;
- pull on lens AW ;
- lens flatter AW ;
- to focus on distant object/longer focal length ; [max. 6*]
- (b) brighter light ;
- circular iris muscles contract** ;
- radial muscles relax** ;
- pupil becomes smaller ; [max. 4*]
- (* to include either of the first two marking points) [Total = 10]

Page 4	Mark Scheme	Syllabus
	GCE O Level – November 2005	5090

- 7 (a) oviduct/Fallopian tube ;
- zygote ;
- cell division/mitosis ;
- ball of cells/blastula/blastocyst ;
- uterus ;
- spongy lining/endometrium ;
- implantation ; [max. 4]

- (b) (i) Each need must be qualified with the importance to pregnancy (max. 1 for list of three unqualified nutrients)
- iron + blood production ;
- calcium/phosphate + bone ;
- protein for embryonic growth ;
- vitamins for healthy development ; [max. 3]

- (ii) contains correct proportions of dietary requirements ;
- antibodies ;
- correct temperature ;
- inexpensive/readily available ;
- sterile ; [max. 3]

[Total = 10]

8 E (A any point marked * to score once only – up to max. for each section.)

- (a) water + inside cells* ;
- osmosis* ;
- pressure/turgor* ;
- cells push against one another* ;
- strengthening/lignin ;
- in xylem ;
- effect of roots ; [max. 4]

Page 5	Mark Scheme	Syllabus
	GCE O Level – November 2005	5090

- (b) (i) stem droops/sags AW ;
 - (plus any points marked * from above)
 - (ii) insufficient water in plant ;
 - water lost by plant faster than it is absorbed ;
 - lack of water in soil ;
 - low humidity ;
 - wind ;
 - high temp ; [max. 6]
- [Total = 10]**

8 O

- (a) (i) no roots to bind soil AW ;
- no protection for soil from wind/rain ;
- soil washed away ; [3]
- (ii) less transpiration ;
- fewer clouds ;
- less rainfall ;
- ref. to temperature (higher temperatures without trees) ; [max. 3]
- (iii) loss of livelihood AW ;
- loss of food ;
- loss of fuel ;
- loss of remedies ;
- homelessness/relocation ; [max. 3]

[N.B. MAX. 8 for (a)]

- (b) nutrients are in the seed ;
 - nutrients from the soil are not required ;
 - Any TWO from: needs water, oxygen, suitable temperature ; [max. 2]
- [Total = 10]**