

GCE



Edexcel GCE

Biology (Human) (6112/01)

Summer 2006

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Mark Scheme (Results)

Edexcel GCE
Biology (Human) (6112/01)

General Principles

Symbols used in the mark scheme

Symbol	Meaning of symbol
; semi colon	Indicates the end of a marking point.
eq	Indicates that credit should be given for other correct alternatives to a word or statement, as discussed in the Standardisation meeting. It is used because it is not always possible to list every alternative answer that a candidate may write that is worthy of credit.
/ oblique	Words or phrases separated by an oblique are alternatives to each other.
{ } curly brackets	Indicate the beginning and end of a list of alternatives (separated by obliques) where necessary to avoid confusion.
() round brackets	Words inside round brackets are to aid understanding of the marking point but are not required to award the point.
[] square brackets	Words inside square brackets are instructions or guidance for examiners.

Crossed out work

If a candidate has crossed out an answer and written new text, the crossed out work can be ignored. If the candidate has crossed out work but written no new text, the crossed out work for that question or part question should be marked, as far as it is possible to do so.

Spelling and clarity

In general, an error made in an early part of a question is penalised when it occurs but not subsequently. The candidate is penalised once only and can gain credit in later parts of the question by correct reasoning from the earlier incorrect answer.

No marks are awarded specifically for quality of language in the written papers, except for the essays in the synoptic paper. Use of English is however taken into account as follows:

- the spelling of technical terms must be sufficiently correct for the answer to be unambiguous
e.g. for amylase, 'ammalase' is acceptable whereas 'amylose' is not
e.g. for glycogen, 'glicojen' is acceptable whereas 'glucagen' is not
e.g. for ileum, 'illeum' is acceptable whereas 'ilium' is not
e.g. for mitosis, 'mytosis' is acceptable whereas 'meitosis' is not
- candidates must make their meaning clear to the examiner to gain the mark.
- a correct statement that is contradicted by an incorrect statement in the same part of an answer gains no mark - irrelevant material should be ignored.

Unit 2H (6112)

Question 1*

* common with 6102

Maximum mark

External ;

Contract ;

Increase / eq ;

Decreases / eq ;

Total 4 marks

Question 2*

* common with 6102

Maximum mark

(a) Cell A Neutrophil / polymorph /granulocyte ;

Cell B Lymphocyte / agranulocyte;

2 marks

(b) Produces antibodies ;

In presence of antigens / attach to antigens/ Correct reference to function of antibody (e.g. clumping of bacteria)/ reference to the formation of memory cells;

2 marks

(c) 1 Contain haemoglobin which {combines/eq} with carbon dioxide ;

2 To form carbaminohaemoglobin/eq ;

3 Presence of carbonic anhydrase ;

4 Formation of {carbonic acid / correct equation} ;

5 Formation of {hydrogencarbonate / correct equation} ;

3 marks**Total 7 marks**

Question 3*

* common with 6102

Maximum mark

- (a) Reference to {blood pressure / hydrostatic pressure} ;
Forces out {water (and solutes)/plasma minus the protein} ;
Of capillaries ;
Reference to {basement membrane / pores} ;
- 3 marks**
- (b) (i) Protein (molecules) are large / eq ;
Cannot pass through {cell membranes / capillary (walls) / eq} ;
- 2 marks**
- (ii) 1. Sodium ions are small ;
2. Membrane is permeable to sodium ions / sodium ions can {diffuse / pass through}
{cell membrane / capillary (walls) / pores} / eq ;
3. No net diffusion / movement ;
- 2 marks**
- Total 7 marks**

Question 4*

* common with 6102

Maximum mark

- (a) (i) Microvillus/ microvilli ; 1 mark
- (ii) Reference to membrane-bound enzymes/eq ;
Named example of enzyme (sucrase, lactase, maltase);
Reference to correct substrates and products / enzymes that convert disaccharides to monosaccharides / eq ; 2 marks
- (b) 1. Membrane of {epithelial cell / microvillus} ;
2. Has carrier proteins ;
3. Reference to sodium co-transport ;
4. Reference to active transport ;
5. Reference to facilitated diffusion ;
6. Diffusion (of glucose) into {blood / capillary} from epithelial cell ;
7. Reference to blood flow maintains {diffusion / concentration} gradient ; 4 marks
- (c) Bread contains starch ;
White bread digested more quickly than wholemeal / eq ;
Jam contains {sugars / glucose} ;
Which are absorbed directly/eq ; 3 marks
- Total 10 marks**

Question 5

Maximum mark

(a) {Sequence / series / eq} of events each time heart beats ;

Atrial systole ;

Followed by ventricular systole ;

Then diastole ;

3 marks

(b) (i) R wave correctly indicated ;

1 mark

(ii) Allows atria to contract (fully) ;

Before ventricles contract ;

Correct reference to {atrial emptying / ventricular filling} ;

3 marks

Total 7 marks

Question 6

Maximum mark

(a) Air pressure decreases (as altitude increases) ;

Quantitative comment ;

2 marks

(b) $(87 - 5 =) 82$ (%) ;

1 mark

(c) Reference to low pO_2 at high altitudes ;

Above 3000 m haemoglobin is less saturated with O_2 (when breathing air) ;

Difference (in saturation) between breathing air and breathing oxygen increases as altitude increases /breathing O_2 increases % saturation ;

Reference to oxygen needed to maintain consciousness ;

Prevent altitude sickness/ named symptom of altitude sickness / eq;

4 marks

Total 7 marks

Question 7

Maximum mark

- (a) 4 ; 1 mark
- (b) B A D C E ;
[correct sequence = 2 marks, one error = 1 mark] 2 marks
- (c) Halves chromosome number / diploid to haploid / $2n$ to n ;
Diploid restored at fertilisation ;
Reference to genetic variation ;
Four {sperm / gametes} produced ;
From each spermatogonium / eq ; 4 marks
- (d) Very few sperm reach the ovum / eq ;
Reference to some sperm not motile / eq ;
Therefore large number needed / eq ;
Reference collective activity / eq ; 2 marks
- Total 9 marks**

Question 8*

* common with 6102

Maximum mark

- (a) Corpus luteum / yellow body ; 1 mark
- (b) {Maintenance / eq} of {endometrium / uterus lining} ;
Inhibits secretion of {FSH / LH} ;
Inhibits secretion of {FSH / LH} releasing hormone ;
Inhibits ovulation ;
Inhibits prolactin secretion ;
Inhibits contraction of uterus ; 2 marks
- (c) Line drawn from peak of curve towards RHS ;
Continuing at the same level as peak / rising (towards RHS) ; 2 marks
- (d) 1 Stimulates contraction of {uterine muscle / uterus} ;
2 Pushing {fetus / baby} out ;
3 Ref to delivery of placenta ;
4 Stimulates contraction of cells in breast ;
5 Propels milk into ducts / eq ; 4 marks
- Total 9 marks**