

GCE



Edexcel GCE

Biology (Human) (6112/01)

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Mark Scheme (Results)

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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*

Maximum mark

*(Common with 6102, Unit 2B)

Statement	First division of meiosis	Second division of meiosis
Pairing of homologous chromosomes occurs	✓	✗
Each chromosome consists of a pair of chromatids during prophase	✓	✓
Crossing over occurs and chiasmata are formed	✓	✗
Independent assortment of chromosomes occurs	✓	✗

[Any two correct responses = 1 mark]

[Blanks are incorrect]

[✗ is incorrect]

Total 4 marks

Question 2*

Maximum mark

*(Common with 6102, Unit 2B)

- (a)
1. Mechanically breaks down large food mass / reference to mechanical digestion / reference to increasing surface area ;
 2. Mixes food with saliva ;
 3. Reference to {tasting / lubrication / (facility of) swallowing} ;

3 marks

- (b)
1. (Bread contains) starch ;
 2. Saliva contains amylase /reference to salivary amylase ;
 3. Starch hydrolysed to {maltose / (soluble) sugars / disaccharides} (which taste sweet) ;

3 marks

Total 6 marks

Question 3*

Maximum mark

*(Common with 6102, Unit 2B)

- (a) (i)
1. Idea that percentage saturation increases as pO_2 increases ;
 2. Reference to greatest change between 1 and 3 / 5 kPa ;
 3. Levels out at high pO_2 / eq;
 4. Credit manipulated quantitative comment ;

2 marks

- (ii)
1. Mouse has much smaller (body) volume/ greater surface area : volume ratio ;
 2. Increased heat loss ;
 3. Increased {metabolic rate / metabolism} ;
 4. Haemoglobin has a lower affinity (for oxygen) ;
 5. Therefore {oxygen released more readily / more oxygen released} to tissues ;

[Mark scheme refers to mouse; could accept converse points for human]

2 marks

- (b)
1. Contraction of external intercostal muscles ;
 2. Relaxation of internal intercostal muscles ;
 3. Contraction of diaphragm ;
 4. Diaphragm {flattens / moves down} / ribs move up ;
 5. Increased volume of thorax / eq ;
 6. Decreased pressure in lungs (so air enters) ;

4 marks

Total 8 marks

Question 4*

Maximum mark

*(Common with 6102, Unit 2B)

- (a)
- A Primordial follicle / primary follicle ;
 - B Secondary oocyte ;
 - C Corpus luteum / yellow body ;

3 marks

- (b) (i)
1. Slow increase up to 10 weeks ;
 2. Faster increase to 29 - 32 weeks / reaches peak at 29 - 32 weeks ;
 3. Then decreases ;

2 marks

- (ii) Maintenance of endometrium / inhibits {FSH / LH / oxytocin / ovulation / uterine contractions / prolactin} / preparation for lactation / increased vascularisation of uterus ;

1 mark

Total 6 marks

Question 5**Maximum mark**

- (a)(i) A Epidermis / epithelium ;
 B Adipose tissue / fat / hypodermis ;
 C Sweat gland ;

3 marks

- (ii) 1. Secretion of sweat ;
 2. Increases as temperature increases / converse ;
 3. Evaporation of water (in sweat) ;
 4. Has cooling effect / reduces body temperature ;
 5. Reference to latent heat ;

3 marks

- (b) (i) As percentage body fat increases, core temperature increases ;
 Credit a quantitative reference / reference to variability ;

2 marks

- (ii) 1. Reference to insulation effect of fat ;
 2. As fat is a poor conductor ;
 3. More fat means {less heat loss / more insulation } / converse ;
 4. By conduction / radiation ;
 5. More fat, more substrate (for respiration) ;
 6. (Therefore) more heat generated ;

3 marks**Total 11 marks**

Question 6**Maximum mark**

(a) (i) Absorbs carbon dioxide ;

1 mark

(ii) 1. Reference to calibrating chart ;

2. Switch on chart recorder ;

3. Nose clip / eq on person ;

4. Person breathes in and out / eq through mouthpiece ;

5. Reference to {resting / quiet breathing / adjustment (of person)} ;

6. Measure / calculate volume on chart / eq ;

3 marks

(b) Vital capacity = $4.25 \text{ (dm}^3\text{)}$;

1 marks**Total 5 marks**

Question 7**Maximum mark**

- (a) (Rhythmic) expansion / eq ;
Of an artery ;

2 marks

- (b) (i) 13-11 ;
= 2 kPa ;

2 marks

- (ii) 1. Heart rate increases ;
2. Stroke volume increases ;
3. Increased force of contraction ;
4. Cardiac output increases ;
5. Reference to increased {oxygen / glucose} demand (by muscles) ;

2 marks

- (iii) 1. Systolic pressure increases, diastolic pressure decreases ;
2. Increase in systolic pressure is greater than the decrease in diastolic pressure ;
3. No change in diastolic pressure at light level of exercise, (but systolic pressure increases) ;
4. Credit a manipulated, quantitative comparison ;

3 marks**Total 9 marks**

Question 8***Maximum mark**

*(Common with 6102, Unit 2B)

- (a) A Seminal vesicle ;
 B Prostate (gland) ;

2 mark

(b) *Accept references to :*

1. Providing lubrication ;
2. Providing nutrients / named example ;
3. Contain hormones /ref to prostaglandins ;
4. Provide fluid for sperm transport ;
5. Provide antioxidants / vitamin C (to prevent sperm deformation / remove free radicals) ;
6. Providing an alkaline medium ;

2 marks

- (c) 1. Erection / eq of penis ;
 2. By increased blood pressure / eq ;
 3. Penis inserted into vagina ;
 4. Muscle contractions cause ejaculation ;
 5. Through urethra ;

4 marks

Question 8 continued

Maximum mark

- (d) (i)
1. Higher temperature (of testes) qualified ;
 2. Reference to environmental oestrogens / pesticides ;
 3. (Environmental) radiation ;
 4. Stress ;
 5. Smoking ;
 6. (Use of) drugs ;
 7. Alcohol ;

2 marks

(ii) *Consequence* :

Decreased fertility / decreased birth rate / decreased population size / increase in IVF / eq ;

1 mark

Total 11 marks