

GCE



Edexcel GCE

Biology / Biology (Human) (6103/03)

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Mark Scheme (Results)

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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 3 paper 3 (6103/03)

Question 1

Maximum mark

(a) Heterotrophism / heterotrophic / holozoic ;

[ignore carnivore]

1 mark

(b) Meat / flesh / animal / protein / eq ;

1 mark

(c) *Eye socket*

1. Forward facing /eq ;

2. {Reference to / description of} stereoscopic vision /eq ;

3. Able to judge / eq {speed / distance / direction} (of prey) ;

Canine teeth

4. Long and pointed ;

5. Positioned at widest part of open mouth / reference to points opposing each other / eq;

6. Reference to {piercing / gripping / holding / stabbing / eq} ;

Premolar & molar teeth

7. Sharp {surfaces / ridges };

8. {Reference to / description of} {carnassial / teeth { scissor-like / eq} action ;

9. Reference to {cutting / slicing / crushing / eq} ;

[No internal maxima - any 6 marks for points related to correct structures]

6 marks

Total 8 marks

Question 2

Maximum mark

- (a) 1. (Mass of) organic {material / compounds} / mass of organisms;
2. [Ignore dry / fresh]
- 1 mark
- (b) 1. $60\,000 \times 0.3 \div 100$;
2. 180 kg ha^{-1} / kg per hectare ;
3. [allow number in table , allow other correct methods]
- 2 marks
- (c) 1. Nitrification / ref to nitrifying bacteria ;
2. {Ammonium / ammonia} to nitrite ;
3. By Nitrosomonas ;
4. Nitrite to nitrate ;
5. By Nitrobacter ;
- [Allow appropriate correct / chemical symbols]
[Max 3 any ref to Nitrogen fixation]
- 4 marks
- (d) (i) 1. Rate {higher / eq} at $15\text{ }^{\circ}\text{C}$;
2. Up to day 2 they are the same ;
3. Up to day 8 {both more-or-less the same / both increase very slowly / eq} ;
4. From day 8, $15\text{ }^{\circ}\text{C}$ increases rapidly, $10\text{ }^{\circ}\text{C}$ continues {slow/ steady / eq increase ;
5. Credit comparative manipulation of figures e.g. 250 kg ha^{-1} difference / approx 7 x greater / 7.25 x greater;
- 3 marks

Question 2 continued

Maximum mark

- (ii) 1. Nitrates released after about 8 days ;
2. When {food reserves / eq} in seed exhausted / when {plant / seedling } starts growing ;
3. Released too rapidly at 25 °C and could be washed away / eq ;
4. {Not released fast enough / not enough released} at 10 °C ;

2 marks

Total 12 marks

Question 3

Maximum mark

- (a)
1. {Rate of /eq }production of (new) {biomass / organic material ;
 2. That is available to next trophic level / eq ;
 3. $NPP = GPP - R$ / eq ;

2 marks

- (b) (i)
1. Light is reflected (away from the leaf) ;
 2. Some light passes straight through leaf / light does not fall on {chloroplast /chlorophyll} ;
 3. Plant cannot use all wavelengths of light / eq;
 4. Photosynthesis is not efficient /eq ;

2 marks

- (ii)
1. (Secondary consumers) respire / loss as heat ;
 2. (Secondary consumers lose energy when they) move around ;
 3. Not all of them are eaten / some die (before being eaten) ;
 4. Ref. to {inedible / undigestable} parts / eq ;
 5. Ref. to decomposition of (secondary consumer) / eq ;

3 marks

- (c) Does not include energy from {producers / other food chains } / this shows energy from only one food chain / they obtain energy from all trophic levels ;

1 mark

Question 3 continued**Maximum mark**

- (d) (i) 1. Total biomass for primary more than total biomass for secondary / use of figures ;
2. Primary has more leaf litter than secondary / eq;
3. {Leaves / branches} the same for primary and secondary ;
4. Primary has more root (biomass) than secondary / eq ;

3 marks

- (ii) 1. After 25 years the total biomass has not returned to the original value ;
2. The leaf litter is lower so there will be less{nutrient / recycling} ;
3. Fewer roots could lead to less water retention / eq ;
4. Fewer roots will lead to more soil erosion /eq ;

3 marks

- (e) 1. Ref. to change in habitats ;
2. allows more light in ;
3. Exposure to wind / loss of shelter from wind ;
4. Exposure to {light / wind } changes plant populations /eq ;
5. May lead to soil {erosion / eq} ;
6. {Plants / eq } cannot get established / eq ;
7. Correct ref to movements of animals /e.g. migration ;
8. Change in types of plants causes change in the types of animals / change in food {chains / webs} ;

4 marks**Total 18 marks**