

Mark Scheme (Results)

Summer 2007

GCE

GCE Biology (6103/03)

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.

Question 1

Maximum mark

(a) parasitic / parasite ;

1 mark

- (b)
1. hooks / scolex ;
 2. {to attach to / to prevent the animal being carried along} {intestine / duodenum / ileum} OR {resist muscular movements/resist peristalsis/eq};
 3. suckers / scolex ;
 4. {to attach to / to prevent the animal being carried along} {intestine / duodenum / ileum} OR { resist muscular movements/resist peristalsis/eq};
 5. {segment(s) / proglottid(s) / thin / flat / ribbon-like / large surface area / eq ;
 6. provides a large surface area / allow for absorption of food / ref to better diffusion / prevent blockage;
 7. cuticle / tegument / coat / chitin / mucus ;
 8. idea of resistance to {enzymes / digestion / eq} ;

6 marks

- (c)
1. *Rhizopus* {secretes enzymes on to food source / digests food}, while tapeworm does not ;
 2. *Rhizopus* grows over the surface of its food, while tapeworms are {endoparasites /description of endoparasitism / eq} ;
 3. *Rhizopus* {feeds on dead material / eq}, while tapeworms do not ;
 4. both have large surface area (to absorb food);

2 marks

Total 9 marks

Question 2

Maximum mark

(a) any two from:

1. overgrazing / excessive grazing / too much grazing ;
2. drought / low rainfall / lack of rain / poor irrigation ;
3. climate change / global warming ;

2 marks

- (b)
1. loss of {vegetation / eq} due to {overgrazing / climate change / drought / eq} ;
 2. {trampling / eq} compacts soil / removes plants ;
 3. soil exposed to {wind / water / heat} (from sun);
 4. soil blown away / carried away by water ;
 5. {water evaporates / evaporation} {from surface of soil} leading to {salinisation /brings salts up / deposits salts on surface / eq} ;
 6. poor irrigation leads to {change in water content of soil / eq} ;
 7. idea of loss of roots loosens soils / eq ;

4 marks

Question 2 continued

Maximum mark

(c) Any two from the following pairs of answers:

1. put in barrier e.g. planting wind breaks / hedges / trees / shelter belt / stones / walls / fence ;
2. to reduce wind speed / provide shelter to crops ;
3. use {plants that are drought resistant / native species / eq} ;
4. idea that plants can survive ;
5. plant fuel crop / eq ;
6. so no need to fell trees / ref to sustainability ;
7. rain water harvesting / irrigation ;
8. to supply water to livestock / plants / crops / agriculture / eq ;
9. control grazing by e.g. density / frequency / number / species ;
10. to prevent loss of vegetation cover / eq ;
11. laying {straw mats / stones / gravel / eq} over ground / add water-retaining material ;
12. to stabilise soil / prevent wind erosion / reduce water loss / retain moisture ;

4 marks

Total 10 marks

Question 3

Maximum mark

- (a) rain that is {more acidic / lower pH} than usual / rain with a pH less than 5.6 ;
1 mark
- (b) 1. use of {fossil fuels / named example} {in a power station / to make electricity / eq} ;
2. vehicle {exhaust / eq} / ref to vehicle using {petrol / eq} ;
2 marks
- (c) 1. higher rainfall (on the hills) / more rain / eq ;
2. conifer trees grow on more acidic soils ;
3. {acidic / podsollic} soils more easily damaged by acid rain ;
4. soils tend to be {thinner / less depth / eq} on hills ;
5. more fog / more cloud / more mist ;
6. conifers {evergreen / retain leaves} ;
7. {leaves / needles} have larger surface area to volume ratio ;
8. conifer roots {shallow / near surface} ;
3 marks
- (d) 1. {needles / leaves / spines} { turn yellow / turn brown / fall off / lose colour / die} ;
2. die-back of branches ;
3. {stunted / slow / less} growth ;
4. {stunted / fewer / shorter} roots ;
5. {damage to / fewer} root hairs / mycorrhiza ;
6. {fewer / lack / eq} lichens ;
3 marks

Question 3 continued

Maximum mark

- (e) 1. pH {ranged between 4.3 and 4.8 / averaged 4.5} before liming / January to April ;
2. {steep / large / sudden / rapid / eq} increase {after liming/May to June} ;
3. {decreases slightly / eq} for rest of year ;
4. credit manipulation of figures ;
- 2 marks
- (f) 1. fall (in aluminium concentration) ;
2. {levels off / fluctuates} after June ;
3. calculation of fall / {0.20 / 0.16 / 0.12} mgdm^{-3}
OR stated range of fluctuation / 0.13 to 0.07 mgdm^{-3} ;
4. {increase in the pH of the soil / eq} causes {less aluminium to be released / aluminium to be held by soil} ;
5. so not washed into the lake (in water) ;
- 4 marks
- (g) 1. (aluminium) causes mucus production in gills ;
2. reduces {oxygen uptake / gas exchange} (in gills) ;
3. this causes suffocation of fish ;
4. reduces the growth rate of the fish ;
5. (aluminium in body of fish / eggs) causes metabolic disorders / enzyme inhibitors / named metabolic process ;
- 2 marks
- (h) 1. increase in the number of {primary consumers / herbivores} ;
2. decrease in the number of producers ;
3. increase in {other predators / secondary consumers / tertiary consumers / other carnivores} ;
- 2 marks

Total 19 marks