

Mark Scheme (Results)

January 2007

GCE

GCE Biology (8040/9040)

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 marks

(a) kJ / J / joule / kilojoule /eq ;

IGNORE references to mass unless incorrect

1 mark

(b)

Organism	Trophic Level	Mode of nutrition
	Producer	Autotrophic
		Heterotrophic
	Primary consumer /decomposers	

One mark for each correct pair ;;

2 marks

(c) (i) 1 ref. to (*Tribolium*) {are active / move around / generate heat / eq} ;

2 correct ref. to respiration (in *Tribolium*) ;

3 ref. to (*Tribolium*) {waste products / excreta / eq} ;

4 not all {*Tribolium* / parts} get eaten ;

5 only energy {stored in tissues / eq} available ;

3 marks

(ii) 1 (wheat seeds) are dead or dormant / eq ;

2 therefore {little / no} loss of energy ;

3 {no / little} {respiration / waste products / eq} ;

2 marks

Total 8 marks

Question 2

Maximum Marks

- (a) (i) 1 mass {decreases / eq} ;
2 ref. to {levelling off / gradient less steep} after 4-6 days / converse;
3 suitable manipulation of figures ;
2 marks
- (ii) 1 saprobionts {feed / eq} on {dead / non-living / eq} (organic) material ;
2 leaves are freshly picked so are still alive / eq ;
3 time needed for saprobionts to {penetrate leaf tissue / secrete enzymes / increase in number / eq} ;
2 marks
- (iii) evaporation / loss of water / ref. to metabolic loss / eq ;
1 mark
- b) 1 freshly picked leaf has {no damage / is complete} and leaf left on compost {damaged / eq} ;
2 (saprobionts) secrete enzymes / named eg ;
3 {organic material / eq} {digested / hydrolysed / broken down / decomposed / eq}
4 ref. to specific example (e.g. proteins to amino acids) ;
5 into soluble products /eq ;
6 that are {absorbed / taken in /eq} {into saprobionts/soak into compost};
4 marks
- c) 1 ref. to {anaerobic / low oxygen} conditions ;
2 aerobic respiration not possible / only anaerobic respiration possible ;
3 ref. to {denitrifying organisms / named e.g. / denitrification / eq} ;
4 {nitrogen compounds / eq} into nitrogen ;
2 marks

Total 11 marks

Question 3

Maximum marks

(a) mass of organic material /eq ; 1 mark

(b) poplars have faster growth rate / native species are slower growing; 1 mark

(c) (i) Yeghegnute ;
growths rates for all hybrids lower than in other areas ; 2 marks

(ii) any **two** from:
ref. to different {soil / {climate / eq} / altitude / aspect / daylength / pests /diseases / pollutants} ;; 2 marks

(d) 1 (idea of) {trees / forests} protect soil from {weather conditions / rain / wind / sun / heat / eq} ;
2 ref. to roots binding soil/eq ;
3 (rain can) wash soil away ;
4 (wind can) blow soil away ;
5 {sun / heat / wind} can dry out the soil ; 3 marks

(e) (i) $1 / 0.161$;
 $= 6.21 \text{ GJ}$; 2 marks

(ii) 1 more electricity generated from gasification / gasification is more efficient ;
2 (approx) twice as much / eq;
3 less {waste heat / ash} from gasification ; **NOT** just figures from chart, except if some manipulation
MUST be relevant to candidate's answer to (e)(i) 3 marks

[max = 2 if no calculation attempted]

Question 3 continued

Maximum Marks

- (f) 1 ref. to change in habitats ;
2 ref. to change in biodiversity ;
3 ref. to change in nesting / shelter / roosting sites ;
4 ref. to change in {food sources / food chains} ;
5 different {predators / pests / diseases} ;
6 ref. to change in {climatic / environmental} conditions ;

3 marks

- g) mixed with petrol / eq ; **NOT** diesel
{80:20 / 8:2 / 90:10 / 9:1 / eq} petrol : ethanol ;

2 marks

(Total 19 marks)