

GCE



Edexcel GCE

Biology / Biology (Human) (6103/03)

Summer 2005

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Mark Scheme (Results)

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Biology / Biology (Human) (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) A Combustion / combusting / burning  
B Respiration / respire / respiring  
C Respiration / respire / respiring  
D Photosynthesis / photosynthesise / photosynthesising

["breathing" negates B or C once]

[1 mark for each correct pair]

2 marks

- (b) 1. {Takes up / locks up / stores} {carbon / carbon dioxide} (for a long time) / eq ;  
2. Named example e.g. {peat / coal / limestone / trees / fossil fuel / chalk / shells} ;

2 marks

- (c) (i) 1. Increase in {temperature of earth's surface / mean global temperature / eq} ;  
2. Carbon dioxide is a greenhouse gas / due to an increase in greenhouse gases ;  
3. (Which) {trap / reflect back} {heat / long wave / infra red} (in the atmosphere) ;  
4. Reference to an {increased / enhanced} greenhouse effect ;  
5. Reference to valid {effect / consequence} e.g. melting ice caps, flooding, climate change ;

2 marks

- (ii) Methane / CH<sub>4</sub> ;  
Nitrous oxide / N<sub>2</sub>O ;  
CFCs (or related gases such as HFC and HCFC) ;  
{Water / H<sub>2</sub>O} vapour ;  
Ozone / O<sub>3</sub> ;

2 marks

Total 8 marks

## Question 2

Maximum mark

(a) {Primary / 1° / first} consumer / herbivore / 2 / second / level 2 ;  
1 mark

(b)  $\{38\ 000 + 48\ 000 / 86\ 000\} \div 92\ 000 \times 100$  ; [accept alternative method]  
 $\{93 / 93.48 / 93.478 / 93.5 / 94\}$  (%) ;  
2 marks

(c) 1. Reference to energy loss {at each stage of / between stages of / along} the {food chain / levels} ;  
2. Only {a small proportion / 6%} of {original plant material / energy} available to pass on to humans from cattle / eq ;  
3. Reference to time scale / eq ;  
4. Only one stage in food chain if {maize / crop} grown (for human consumption) / human would be primary consumer ;  
3 marks

(d) 1. {Incisors / canines} {chop / cut / eq} ;  
2. {Hard pad / eq} acts as {chopping surface / eq} ;  
3. Molars {grind / crush} ;  
4. Lower jaw has a {side to side action / circular / eq} / reference to loose articulation ;  
3 marks

(e) 1. Reference to {micro-organisms / bacteria / protozoa / yeast} in rumen ;  
2. (Microorganism) produce {cellulase / eq} ;  
3. Breaks down {cellulose / cellulobiose} to {sugars / monosaccharides / other suitable products} ;  
4. Reference to {mutualism / symbiosis} ;  
5. Reference to {regurgitation / chewing cud} allows {several digestion / increases surface area / better breakdown / further chewing / eq} ;  
3 marks

Total 12 marks

## Question 3

Maximum mark

- (a)
1. Papua New Guinea no change ;
  2. Brunei and Thailand both decrease ;
  3. Any relevant comparison between decrease in Thailand and Brunei e.g. decrease greater for Brunei than Thailand ;
  4. Any two comparative manipulated figures e.g. 28% for Brunei and 12% for Thailand between '73 and '88 ;

3 marks

- (b)
1. Agriculture / named example ;
  2. Industry / named example ;
  3. Urbanisation / named example ;
  4. Fuel / named example ;
  5. Acid rain ;
  6. Natural disaster / named example ;

2 marks

- (c)
1. (Removal of trees) causes loss of protective cover for soil / exposed to {sun / rain / water / wind} ;
  2. Tree roots {hold soil together / stabilise soil} / reference to humus binding soil ;
  3. {Rain / water} {runs off the surface, carrying soil / washes soil away} ;
  4. Wind blows away soil ;

3 marks

- (d)
1. Less water evaporates from trees into atmosphere / reference to less transpiration ;
  2. Less water in soil / more water runs off into {streams / rivers / eq} ;
  3. Causes flooding ;
  4. Less water vapour in atmosphere so less rain ;
  5. Leads to {drought / low water table} ;
  6. Reference to disruption of global {climate / rainfall patterns} ;

3 marks

## Question 3 continued

Maximum mark

- (e)
1. Idea of damage to forest as trees are removed / eq ;
  2. Removing trees leaves gaps in canopy ;
  3. More {light / rain} reaches forest floor ;
  4. Other species of plants may grow in the spaces / tree seedlings may grow in the light ;
  5. Loss of {habitat / nesting site / roosting site} for the animals that live in the timber trees ;
  6. Food chain affected / loss of food supply ;
  7. New habitats created / changes may favour other {plants / animals / organisms / species} / change in biodiversity ;
- 3 marks**
- (f) (i)
1. All species show an {immediate / eq} fall in numbers (after logging) ;
  2. Gibbons {recover after two years / do not return to original number} ;
  3. After two years number of Maroon Langur {much higher than before logging / then {almost disappear / very low} after 4 years} ;
  4. After 4 years number of White-fronted Langurs {almost double / eq} (compared with those before logging) ;
- 2 marks**
- (ii)
1. The idea that the decrease is due to disturbance caused by {logging / machinery / people} ;
  2. {Gibbons / Maroon Langur} need closed forest / need trees closer together / don't like more open forest / prefer taller trees ;
  3. Need trees for {movement through the canopy / food supply / escape predators} ;
  4. White-fronted Langur {prefers more open forest / out compete others / better adapted} so numbers increase ;
- 2 marks**

**Total 18 marks**