

Mark Scheme (Results) Summer 2007

GCE

GCE O Level Biology (7042/01)

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.

1. (a) A - waterproof / prevents entry of bacteria;
 B - forming new cells / produces melanin / absorbs uv;
 C - thermal / heat insulation; (3)
- (b) X - contraction of muscle;
 hair pulled upright;
 traps more air;
 greater insulation;
Any two - 1 mark each
- Y - contraction of muscles in arteriole / vasoconstriction;
 diverts blood into shunt vessel / less blood to surface
 vessels / capillaries;
 less heat lost (via capillaries / radiation);
Any two - 1 mark each
- Z - no / less sweat formed;
 reduced evaporation / ref. to latent heat;
 less heat loss;
Any two - 1 mark each (6)

Total 9 marks

2. (a) (i) Oestrogen is produced here - B;
 Shed each month during menstruation - D;
 Sperm deposited here - F;
 Sometimes becomes blocked as a result of gonorrhoea - A;
 Muscles that expel baby during birth - C; (5)
- (ii) label line to shaded area of endometrium;
NOT in oviduct or cervix (1)
- (b) (i) prevents FSH;
 no ovulation;
 maintains uterine lining;
 prevents miscarriage; max
Any two - 1 mark each (2)
- (ii) first 3 months - ovary / B;
 latter 6 months - placenta; (2)
- (c) onset of menstruation / Day 1 / Day 28;
 around ovulation / Day 14; (2)

Total 12 marks

3. (a) (i) A - 25 breaths per minute; (1)
- (ii) 6 minutes; (1)
- (iii) B; (1)
- slower breathing rate;
rises less on exercise;
more rapid recovery;
Any two - 1 mark each (2)
- (b) oxygen debt built up / anaerobic respiration;
lactic acid formed;
cannot be stored for long / cause cramps / toxic / eq;
requires oxygen to break it down;
therefore higher than normal oxygen demand; (max)
Any three - 1 mark each (3)

Total 8 marks

4. (a) (i) blue / blue-black (1)
- (ii) turns to pale yellow/brown / blue colour fades/disappears; (1)
- (iii) keep all at the same temperature;
use same volume / amounts of starch;
use same volume / amounts of amylase / enzyme;
use same volume / amounts of iodine solution;
Any two - 1 mark each (max)
(2)
- (b) (i) 40 °C; (+/- 1 °C) (1)
- (ii) less activity / will not work as fully;
active site / shape of molecule changed;
denatured; (max)
Any two - 1 mark each (2)
- (iii) shape inversion of printed graph in (b); (1)
- (c) Amino acids are converted to urea - **Liver**;
Energy is released from glucose in a cell - **Mitochondrion**;
Antibodies are made from amino acids - **White blood cell**;
Fats are broken down into fatty acids and glycerol - **Duodenum**; (4)
- (d) by joining together;
amino acids;
by peptide bonds;
ref. to (long) chains / coiling;
correct ref to RNA;
role of ribosomes; (max)
Any three - 1 mark each (3)

Total 12 marks

- 5. balanced;
 mineral salts / mineral ions;
 starch;
 energy;
 digested;
 peristalsis;
 (deficiency) disease;
 D;

Total 8 marks

- 6. (a) (i) All correctly plotted; (3)
 up to 1 errors in plotting - max (2)
 up to 2 errors in plotting - max (1)
- (ii) 30 minutes; (1)
- (iii) secretion of insulin / eq; (1)
- (iv) (liver converts) glucose to glycogen; max
 stored in liver; (2)
 blood glucose falls;
- (b) (i) 60 - 75 minutes; (1)
- (ii) B reaches a higher level / B reaches 210 (mg per 100 cm³)
 while A only reaches 140 (mg per 100 cm³) / reaches lower
 level; (1)
- (iii) respiration;
 by cells;
 glucose broken down;
 excretion;
 via kidney / nephron;
 not all glucose reabsorbed; max
 Any four - 1 mark each (4)

Total 13 marks

7. (a) (i) A - pulmonary artery; (3)
B - aorta;
C - left ventricle;
- (ii) A has more carbon dioxide than B;
A has less oxygen than B;
A has more glucose than B; max
Any two - 1 mark each (2)
- (b) (i) cardiac muscle involuntary / myogenic, while skeletal
muscle voluntary;
c.m. not attached to bones while s.m. is;
c.m. does not tire / fatigue while s.m. does;
c.m. undergoes rhythmic contraction while s.m. does not;
c.m. is uninucleate while s.m. is multinucleate;
c.m. branching, s.m. unbranched; max
Any two - 1 mark each (2)
- (ii) able to create greater pressure / eq;
has to force blood further / eq; (2)
- (c) (i) antibodies / lymphocytes;
made in lymphatics / lymph glands;
- fat / fatty acid / glycerol levels;
absorbed in villi into lymphatics;
- vitamins A / D;
absorbed in villi into lymphatics;
- Any two substances with adequate reasons - 2 marks each (4)
- (ii) higher fat levels (in blood vessels) near heart / might
increase risk of heart attack / blockage of vessels (near
heart); (1)

Total 14 marks

8. (a) (i) Oceania; (1)
- (ii) high HIV infection - associated with lower life expectancy;
Africa 6.1 HIV / low life expectancy 52;
Europe / Oceania lower HIV and high life expectancy 73 / 75; (3)
- (iii) Africa; (1)
- Any two points from:**
ref. to child life expectancy / safe water supply / infant mortality / poverty; (1)
- (b) (i) no (no mark)
- compare Y / Z with X;
X has highest infant mortality, low income, lowest safe water;
but low HIV; (2)
- (ii) can afford good medical care;
can afford drugs;
can afford good diet;
good education;
Any one - 1 mark (1)
- (iii) use of condoms;
reduce number of sexual partners;
care with blood transfusions / checking blood;
do not share needles; max
Any two - 1 mark each (2)

Total 11 marks

9. (a) (i) A - digestion / action of protease;
B - absorption / diffusion;
C - protein synthesis / assimilation / eq; (3)
- (ii) pancreas; (1)
- (iii) villi; (1)
- (iv) ribosomes; (1)
- (b) fibrinogen / prothrombin / thrombokinase;
lipase;
haemoglobin;
insulin / glucagon; (4)

Total 10 marks

PAPER TOTAL 100 MARKS