

Mark Scheme (Results)

Summer 2007

GCE O

GCE O Biology (7040/01)

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.

BIOLOGY 7040/01 MARK SCHEME

Symbols used in mark points

- ; indicates separate mark points
/ indicates alternatives
eq means allow any correct equivalent

Paper 1

1. (a) (i) A ovary;
B petal;
C anther;
D stigma; (4)
- (ii) D; (1)
- (b) A becomes fruit;
B falls off / withers / dies / eq; (2)
- (c) large flowers / petals;
nectar / nectar guides;
scent produced;
coloured / attractive / conspicuous (petals) / eq;
stamens short / stunted / anthers within flower;
stigma short / stunted / within flower;
stigma sticky; max
pollen less / sticky / spiky; (3)
- (d) A / ovary / ovule;
C / pollen / anther; max
ova / egg (nucleus) / pollen (nucleus) / gametes; (2)

Total 12 marks

2. (a) (i) walking up and down stairs; (1)
- (ii) 460 (%);;
(1) for working 28-5 OR 23 (2)
- (b) faster / more movement / whole body / eq;
(more) muscle contraction; (2)
- (c) greater energy requirement;
more (cell) respiration; max
more mass / heavier; (2)

Total 7 marks

3.

Group	Feature	Example
Plants;	Multicellular. Carry out photosynthesis. Have cell walls.	Maize / eq;
Animals;	Multicellular. Can usually move. Have no cell walls.	Human / eq;
Fungi	ANY TWO FROM have cell walls / chitin; hyphae / mycelium; feed on dead decaying organisms / saprophytic / saprotrophic; do not carry out photosynthesis / lack chloroplasts / lack chlorophyll; extracellular digestion / eq; produce spores;	<i>Mucor</i>
Bacteria;	Microscopic, single celled. Lack nucleus. Some feed on dead organisms, others pathogenic.	<i>Pneumococcus</i>
Virus	Very small particles. Can only live inside other organisms.	Influenza / HIV / AIDS / bacteriophage / eq;

Total 8 marks

4. excretion;
carbon dioxide / water;
water / carbon dioxide;
urine;
ureter(s);
bladder;
urethra;

Total 7 marks

5. (a)

Name	Effect
(insulin)	(blood glucose level decreased)
adrenaline;	(heart rate increased)
oestrogen;	(uterus lining repaired)
(progesterone)	uterus lining maintained/kept / LH / FSH production inhibited / maintain pregnancy;
(ADH)	control water reabsorbed / water in blood / osomregulation / increase in permeability of collecting duct;
testosterone;	(stimulates the development of male secondary

(5)

(b) (i) glycogen; (1)

(ii) crenation / buckle / shrink / crumple / eq;
loss of water/eq;
from high concentration to low concentration; (3)

(c) (human) gene / DNA;
cut / eq;
restriction enzyme / endonuclease;
stick / joined / eq;
ligase; max
plasmid; (4)

Total 13 marks

6. (a) A upper epidermis;
B palisade (mesophyll);
C spongy (mesophyll);
D lower epidermis; (4)

(b) B / palisade (mesophyll);
near surface / upper epidermis / light;
contains most / lots of chloroplasts / chlorophyll; (3)

(c) (i) carbon dioxide in;
oxygen out; max
photosynthesis; (2)

(ii) open/close idea;
affects water loss; max
diffusion / evaporation; (2)

Total 11 marks

7. (a) more energy;
more fat/lipid;
more carbohydrate / eq;
fat deposit/storage;
weight gain;
ref to lack of exercise; max
(3)

- (b) cholesterol / fatty substance build up;
blocks (coronary) arteries;
less blood/oxygen/glucose;
heart attack / angina / failure / eq;
increase blood pressure; max
(2)

Total 5 marks

8. (a) (i) liver; (1)

- (ii) aorta; (1)

- (iii) hepatic portal vein; (1)

- (b) (i) renal artery; (1)

- (ii)

Component	Concentration of the component in the blood	
	Blood entering kidney	Blood leaving kidney
antibody	same	same
urea	more	less;
water	more	less;
red blood cells	same	same;
carbon dioxide	less	more;

(4)

Total 8 marks

9. (a) P - vena cava;
Q - aorta;
R - pulmonary artery;
S - pulmonary vein; (4)

- (b) Adult - lung / alveoli;
Fetus - placenta; (2)

- (c) between atria / vena cava to left atrium;
between Q and R / pulmonary artery and aorta; (2)

Total 8 marks

10. (a) (i) TT tt;
T t;
Tt; (3)

(ii) tall allele/T dominant / dwarf allele/t recessive;
not co-dominant / no incomplete dominance;
offspring Tt/heterozygous/one T present/tall and dwarf allele/T (always) expressed; max (2)

(b) Rr Rr;
gametes R r R r ;
RR Rr Rr rr ;
purple purple purple white;

If genotype of offspring gives one Rr, lose (1) (4)

Total 9 marks

11. (a)

Food component	Required for	Suitable source	Deficiency disease
Calcium	bones / teeth / blood clotting / muscle contraction;	dairy foods / fish / soya milk / rice milk;	Rickets
Vitamin C;	Development of bones cartilage and gums	fruit / vegetables;	Scurvy
Protein	growth / making cells / tissues / protoplasm / repair / muscles / enzymes / cell membrane / hormones / eq;	meat / eggs / nuts / beans / lentils / pulses / fish / dairy products;	Kwashiorkor;
Iron;	red blood cells / haemoglobin / myoglobin / oxygen transport;	red meat / liver / eggs / spinach / green vegetables;	Anaemia

(10)

(b) Biuret / sodium hydroxide and copper sulphate;
purple / violet / mauve / lilac; (2)

Total 12 marks

PAPER TOTAL 100 MARKS