

Edexcel International
London Examinations
GCE

O level Biology (7040)
Mark Scheme for Specimen Papers
Paper 2

Symbols used in the Mark Scheme

- ; indicates separate mark points
- / indicates alternatives
- eq allow for correct equivalent
- word underlined means no alternatives allowed

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SECTION A

1. (a) resistant bacteria not killed (by antibiotics);
disease spreads / multiplies (unchecked); (2)
- (b) acid prevents enzyme action / denatures enzymes;
change in acidity / acid kills bacteria; (max 1)
- (c) human; greenbottle; (2)
- (d) greenbottle larvae feed only on dead flesh;
will not damage healthy flesh; (2)
- (e) (i) proteases / eq / lipase;
peptides / amino acids / fatty acids and glycerol; (2)
(ii) digestion is external / enzymes secreted out of
organism / eq; saprotrophic / feed on dead /
decaying tissue; (max 1)
- (f) random / spontaneous / sudden / rare;
change in genetic constitution / DNA / chromosomes;
passed on to next generation / inherited; (max 2)
(Total 12 marks)
2. (a) remove water / solution (that would affect mass); (1)
- (b) (mass change) -0.1 g;
0.92%;
sign (-); (3)
- (c) by osmosis;
from dilute solution to more concentrated solution /
equivalent description of gradient;
selectively permeable membrane;
(water) (10% NaCl)
water enters / water leaves;
mass increases / mass falls;
turgid / flaccid; (5)
- (d) allow for differences in original mass; (1)
- (e) measure size / volume / length / liquid volume;
workable method;
two solutions stated; (3)
(Total 13 marks)

3. (a) (i) scale (over 50% of either axis);
axes labelled including units;
line (not curved);
points ($\times 2$);; (5)
- (ii) increasing the concentration of enzyme reduces the time
to react; eq;
largest effect between 0.1 and 0.25 / quicker at the
start / less effect as concentration increases; (2)
- (b) (i) fair test / optimum temperature / works best at this
temperature; (1)
- (ii) water bath or description; (1)
- (c) 20 °C
reaction will be slower / take longer;
molecules have less energy for collisions; (2)
- 80 °C
reaction will be slower / no reaction / no digestion /
take longer;
high temperature denatures enzyme molecule, etc; (2)
- (Total 13 marks)**

4. (a) (i) potometer; (1)
- (ii) transpiration / evaporation; (1)
- (b) ensure watertight / airtight / no leaks;
cut stem under water / fill with water;
cut at an angle; (max 2)
- (c) (i) 2.5×5 ;
12.5 cm; (2)
- (ii) (wind) removes water / water vapour / saturated air;
restores / increases diffusion / concentration gradient;
therefore increases diffusion rate / transpiration /
evaporation; (3)
- (Total 9 marks)**

5. C use different coloured bulbs / different coloured filters;
 O use water plant / elodea;
 R repeat each colour / filter at least two times;
 M 1 count number of bubbles given off / collect volume of gas;
 M 2 in a stated time 1 minute to 1 hour;
 S use same plant each time;
 keep temperature constant;
 keep carbon dioxide conc. constant;
 control light intensity; **(max 6)**
(Total 6 marks)
6. (a) magnesium required for chlorophyll production;
 lack of photosynthesis;
 less carbohydrate for growth; **(max 2)**
- (b) no / poor growth in distilled water / E / normal growth in A;
 any difference between complete and deficient due to effect
 of missing mineral; **(1)**
- (c) allow light to reach plants;
 enable photosynthesis to take place; **(2)**
- (d) method of finding the area (eg use graph paper and draw around
 a sample of leaves);
 multiply up / use all leaves; **(2)**
(Total 7 marks)

TOTAL FOR SECTION A: 60 MARKS

SECTION B

7. (a) stomata open;
carbon dioxide enters;
photosynthesis;
oxygen exits;
water exits; **(4 max)**
- (b) more transpiration;
more photosynthesis and more carbon dioxide enters;
more photosynthesis and more oxygen exits;
more respiration and more oxygen enters;
more respiration and more carbon dioxide exits; **(4 max)**
(Total 8 marks)
8. (a) sexual reproduction (normally) requires two parents;
sexual reproduction produces more offspring;
sexual reproduction involves gamete formation;
sexual reproduction involves fertilisation;
sexual reproduction produces genetic variation; **(4 max)**
- (b) mitosis produces 2 cells / meiosis 4 cells;
mitosis produces no genetic variation / meiosis produces genetic variation;
mitosis in asexual reproduction / meiosis in sexual reproduction;
mitosis occurs in growth;
mitosis occurs in somatic cells / meiosis in gonads;
mitosis maintains chromosome number / meiosis halves chromosome number; **(4 max)**
(Total 8 marks)
9. (a) determined entirely by genotype;
example eg Blood group eq;
determined entirely by environment
example eg Scar eq;
determined by both genotype and environment;
example eg height / mass;
dominance / codominance **(5 max)**
- (b) energy lost at each stage;
used by each organism;
used in respiration;
heat loss;
faeces / urine; **(3 max)**
(Total 8 marks)

TOTAL FOR SECTION B: 16 MARKS

SECTION C

- 10.** in mouth food chewed / crushed / to increase surface area;
in stomach;
pepsin / pepsinogen / protease / protein digesting enzyme;
digests;
protein to peptides / polypeptides to peptides;
in small intestine / duodenum / ileum;
trypsin;
proteins to peptides;
peptidases;
peptides to amino acids;
lipase;
lipids to fatty acids and glycerol;
bile;
fats to fat droplets / emulsification;
amino acids into capillary;
fatty acids / glycerol into lacteal;
in villi;
reference to villi increases surface area;

(max 12)
(Total 12 marks)

- 11.** carbon dioxide diffuses;
down concentration gradient;
from blood;
dissolves;
in moisture lining alveoli;
intercostals muscles;
ribs move down and in;
diaphragm;
relaxes;
returns to arch / dome shape;
increases volume in chest cavity;
reduces pressure in chest cavity;
air leaves lungs down a pressure gradient;
lungs deflate;
air leaves via bronchioles / bronchi;
trachea / windpipe;

(max 12)
(Total 12 marks)

12. transparent upper surface / epidermis;
allows light to penetrate;
palisade cells near upper surface;
contain chloroplasts;
to absorb light;
spongy mesophyll cells;
contain air spaces;
to allow gases to diffuse;
contains stomata;
to absorb / take in carbon dioxide / gas exchange;
leaves contain xylem vessels;
to bring water to the leaf;
leaves contain phloem vessels;
to distribute sugars / sucrose / amino acids through plant;
large surface area to absorb max light / gases;
thin to allow gases / light to penetrate;

(max 12)

(Total 12 marks)

TOTAL FOR SECTION C: 24 MARKS

TOTAL FOR PAPER: 100 MARKS

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