

IGCSE DA Biology 4437 4H Mark Scheme (Results) Summer 2008

IGCSE

IGCSE DA Biology 4437 4H



4437-4H MARK SCHEME

Key

indicates separate mark points indicates alternatives

eq

allow for correct equivalent word underlined means no alternatives allowed

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|--|-----------------------|--------|-------|
| 1 (a) | access / transport / travel / communication/ trees for a purpose / construction / manufacture / logging / eq trees for fuel/ farming / mining; | | | 1 (1) |

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|---|-----------------------|--------|-------|
| 1 (b) | loss of habitat / food; loss of numbers / death / extinction / loss of genes / migration / loss of species / eq; | | | Max 4 |
| | less photosynthesis; global warming / greenhouse effect / ref to CO ₂ in air; | | | |
| | soil erosion idea / <u>leaching;</u> flooding / eutrophication / desertification / lack of minerals / | | | |
| | eq; | | | (4) |
| | less transpiration; less rainfall; | | | |

(Total 5 marks)

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|-------------------------------|-----------------------|--------|-------|
| 2 (a)(i) | anther / stamen / pollen sac; | 7.1.10.17.0.1 | | 1 (1) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|-----------|---|------------|--------|-------|
| Number | | Answers | | |
| 2 (a)(ii) | drawn to anther only (not to filament); | | | 1 (1) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|------------|--|------------|--------|------|
| Number | | Answers | | |
| 2 (a)(iii) | pollen; from <u>anther/P</u> to <u>stigma</u> ; | | | 2 |
| | | | | (2) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|------------------|------------|--------------|------|
| Number | | Answers | | |
| 2 (b) | light / gravity; | sun / | phototropism | 1 |
| | | sunlight; | / geotropism | (1) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|---------------------------------|------------|--------|------|
| Number | | Answers | | |
| 2 (c)(i) | carbon dioxide + water; (or | chemical | | 2 |
| | opposite) | symbols;; | | |
| | glucose + oxygen; (or opposite) | | | (2) |
| | Ignore light / chlorophyll | | | |

| Question | Correct Answer | Acceptable | Reject | Mark |
|-----------|---|------------|---------------------------|-----------|
| Number | | Answers | | |
| 2 (c)(ii) | thin; large surface area; stomata; air spaces / spongy (mesophyll); | | pores / guard cells | Max 2 (2) |

(Total 9 marks)

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|---|-----------------------|--------|-------|
| 3 | mouth / saliva; mechanical digestion / chewing / mastication / eq; amylase; ONCE Ignore carbohydrase (starch to) maltose; | | | Max 6 |
| | pancreas / pancreatic juice / eq; small intestine / duodenum / ileum; starch/maltose to glucose; maltase; | | | (6) |

(Total 6 marks)

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|---|-----------------------|--------|------|
| 4 | vena cava; atrium / auricle; lung; valves; aorta; hepatic; glucose / sugar; glycogen; | | | 8 |

(Total 8 marks)

| Question Number | Correct Answer | | Acceptable Answers | Reject | Mark |
|--------------------|---|---------------|-----------------------|--------|-------|
| 5 (a) | Step | Order of step | all 4 = 3;;; | | Max 3 |
| | repeat crosses for several generations | 4 | 2 correct = 2;; | | |
| | cross parent plants to produce more offspring | 2 | 1 correct = 1; | | |
| | identify parent plants with desired characteristics | 1 | | | |
| | select offspring with desired characteristics | 3 | | | (3) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|--|------------|--------|-------|
| Number | | Answers | | |
| 5 (b) | large numbers; quickly produced; identical / all have desired characteristic / cloned / eq; | | | Max 2 |
| | · | | | (2) |

(Total 5 marks)

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|--|-----------------------|--------|-------|
| 6 (a) | 3.6 / 5.4 x 100 = 66.7;; Accept 66.67 / 66.6666etc one for 3.6 | 66 and two thirds; | | 2 (2) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|---|------------|--------|-------|
| Number | | Answers | | |
| 6 (b) | all / extra / increase / more mineral ions / more named mineral / correct amount / eq; use or purpose; | nutrients | | 2 (2) |

(Total 4 marks)

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|---------------------------------|------------|--------|------|
| Number | | Answers | | |
| 7 (a)(i) | Dd and Dd; | | | 2 |
| | DD, Dd, Dd, and dd; (any order) | | | |
| | | | | (2) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|-----------|------------------------------|------------|--------|------|
| Number | | Answers | | |
| 7 (a)(ii) | 3:1 / 75:25 / 75% to 25% / 3 | | | 1 |
| | quarters to 1 quarter / eq; | | | (1) |
| | | | | |

| Question | Correct Answer | Acceptable | Reject | Mark |
|------------|--|------------|--------|-------|
| Number | | Answers | | |
| 7 (a)(iii) | zero; both parents must be DD / dd parents are sterile / neither parent has d/recessive allele; Ignore term gene | | | 2 (2) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|---|------------|--------|-------|
| Number | | Answers | | |
| 7 (b) | bigger surface area to volume ratio; lack insulation/fat; lose (more) heat; maintain body temperature; | | | Max 2 |
| | respiration; | | | (2) |

(Total 7 marks)

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|---|-----------------------|--------|------|
| | | | | |
| 8 (a) | glucose / C ₆ H ₁₂ O ₆ ; | chemical | | 2 |
| | carbon dioxide/CO ₂₊ | symbols | | (2) |
| | ethanol/alcohol/ C ₂ H ₅ OH; | | | |
| | Ignore energy | | | |

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|---|------------|--------|-----------|
| Number | | Answers | | |
| 8 (b)(i) | gene / DNA / allele (for enzyme); cut; restriction / endonuclease; plasmid / vector / gene gun / phage / virus; ligase; gene / DNA / allele into yeast; | | | Max 4 (4) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|-----------|---------------------------------------|------------|--------|------|
| Number | | Answers | | |
| 8 (b)(ii) | enzyme / amylase; | | | 2 |
| | digests starch / less starch / starch | | | (2) |
| | to sugar; | | | (2) |

(Total 8 marks)

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|---------------------------------------|------------|--------|------|
| Number | | Answers | | |
| 9 | bacteria / named bacteria; | | | |
| | ammonia/ammonium (cpds) to | | | |
| | nitrite/nitrate / nitrite to nitrate; | | | |
| | protein / amino acids / growth; | | | (3) |

(Total 3 marks)

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|---------------------------------|------------|--------|------|
| Number | | Answers | | |
| 10 (a) | energy / insulation / cell | keep warm | | 1 |
| | membranes / neurones / growth / | / eq | | (1) |
| | making new cells /eq; | | | |

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|----------------------------------|------------|--------|-------|
| Number | | Answers | | |
| 10 (b) | respiration / heat / excretion / | | | Max 2 |
| | egestion / movement / uneaten / | | | |
| | indigestible;; | | | (2) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|----------|--------------------------------------|------------|--------|-------|
| Number | | Answers | | |
| 10 (c) | nitrates / mineral ion(s) / named | | | Max 5 |
| | mineral ion(s) / eq; | | | |
| | growth of plants / algal bloom; | | | |
| | eutrophication; | | | |
| | light blocked / less photosynthesis; | | | |
| | death of organisms (plant/fish); | | | |
| | bacteria / microorganisms / eq; | | | |
| | oxygen depletion /eq; | | | (5) |
| | respiration; | | | |

(Total 8 marks)

| Question Number | Correct Answ | ver | | Acceptable Answers | Reject | Mark |
|--------------------|--------------|--------|-------------|-----------------------|--------|------|
| 11 (a) | | | | TE for | | |
| | Person | BMI | Description | wrong BMI | | |
| | | value | of weight | but | | |
| | Α | (24.2) | (normal | correct | | |
| | | | weight) | description | | |
| | В | 29.6 | overweight | = 1 | | |
| | С | 39.6; | obese; | | | |
| | | • | <u>'</u> | | | (2) |

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|-----------------------------------|-----------------------|--------|----------|
| 11 (b) | higher / greater / increase / eq; | | | 1 (1) |

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|--------------------------------|-----------------------|--------|------|
| | | | | |
| 11 (c)(i) | more risk for men up to 28 / | allow higher | | 2 |
| | similar risk up to 28 / eq; | BMI/overweight | | |
| | more risk for women (than men) | as eq to 28 | | (2) |
| | above 28; | | | |
| | more risk for men and women | | | |
| | above 28; | | | |
| | more risk as BMI increases; | | | |
| | | | | |

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|---|-----------------------|--------|-------|
| 11 (c)(ii) | <pre>coronary artery; fat/cholesterol blocks/deposits; (aerobic to) anaerobic; (less) oxygen; (less) glucose; less respiration / less energy / ATP; lactic acid; builds up / toxic / inhibit enzymes / eq;</pre> | | | Max 5 |
| | | | | (5) |

(Total 10 marks)

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|---|-----------------------|--------|-------|
| 12 (a) | location; (Bowman's capsule / glomerulus) | converse | | Max 3 |
| | pressure used; | | | |
| | no energy/ATP required / no active transport; | | | |
| | molecules out of blood / into nephron / eq; | | | (3) |
| | depends on molecule size / eq; | | | |
| | hormones not involved; | | | |

| Question Number | Correct Ans | wer | | Acceptable Answers | Reject | Mark |
|--------------------|---------------------------------------|---|---|-----------------------|--------|------|
| 12 (b)(i) | Event | Volume of urine (large or small) | Concentration of urine (dilute or concentrated) | | | |
| | after doing lots of exercise | small; | (concentrated) | | | |
| | after eating lots of protein | (small) | concentrated; | | | |
| | after drinking lots of water | large | dilute; | | | |
| | after eating salty crisps | small | concentrated; | | | (4) |

| Question Number | Correct Answer | Acceptable Answers | Reject | Mark |
|--------------------|---|-----------------------------|--------|-------|
| 12 (b)(ii) | (less) water reabsorbed; collecting duct; ref permeability; more loss of water / more water in urine / more urine / dilute urine / dehydration / blood concentration increases; | ADH story in converse | | 4 (4) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|-----------|--|------------|--------|-----------|
| Number | | Answers | | |
| 12 (c)(i) | less pressure / flow speed; larger lumen / eq; closer to surface / easier to see / eq; thinner wall / easier to penetrate; | converse | | Max 2 (2) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|------------|---------------------------|------------|--------|------|
| Number | | Answers | | |
| 12 (c)(ii) | diffusion; | | | 2 |
| | high conc. to low conc. / | | | |
| | conc.gradient; | | | |
| | | | | (2) |

| Question | Correct Answer | Acceptable | Reject | Mark |
|-------------|------------------------------------|------------|---|-----------|
| Number | | Answers | | |
| 12 (c)(iii) | urea; carbon dioxide; water; | | toxins / hormones / glucose / lactic acid | Max 2 (2) |

(Total 17 marks)

PAPER TOTAL 90 MARKS