# IGCSE DA Biology 4437 4H <br> 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 <br> Number | Correct Answer | Acceptable <br> Answers | Rej ect | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1}(\mathbf{a})$ | access / transport / travel / <br> communication/ trees for a purpose <br> / construction / manufacture / <br> logging / eq <br> trees for fuel/ <br> farming / mining; |  | 1 |  |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1}$ (b) | loss of habitat / food; <br> loss of numbers / death / extinction <br> / loss of genes / migration / loss of <br> species / eq; <br> less photosynthesis; <br> global warming / greenhouse effect / <br> ref to CO2 in air; <br> soil erosion idea / leaching; <br> flooding / eutrophication / <br> desertification / lack of minerals / <br> eq; <br> less transpiration; <br> less rainfall; | Max 4 |  |  |

(Total 5 marks)

| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{2 ( a ) ( \mathbf { i } )}$ | anther / stamen / pollen sac; |  |  | $1 \quad$ (1) |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{2 ~ ( a ) ( i i ) ~}$ | drawn to anther only (not to <br> filament); |  |  | $\mathbf{1} \quad$ (1) |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| 2 (a)(iii) | pollen; <br> from $\underline{\text { anther/ }}$ P to stigma; |  | 2 |  |


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


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


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

(Total 9 marks)

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

(Total 6 marks)

| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{4}$ | vena cava; <br> atrium / auricle; <br> lung; <br> valves; <br> aorta; <br> hepatic; <br> glucose / sugar; <br> glycogen; |  |  | 8 |

(Total 8 marks)


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

(Total 5 marks)

| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{6 ~ ( a ) ~}$ | $3.6 / 5.4 \times 100=66.7 ;$ Accept <br> $66.67 / 66.6666 \mathrm{etc}$ <br> one for 3.6 <br> 66 and two <br> thirds; |  | 2 |  |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{6}$ (b) | all / extra / increase / more <br> mineral ions / more named mineral <br> / correct amount / eq; <br> use or purpose; | nutrients |  | 2 |

(Total 4 marks)

| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{7}$ (a)(i) | Dd and Dd; <br> DD, Dd, Dd, and dd; (any order) |  |  | 2 |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{7 ( a ) ( i i )}$ | $3: 1 / 75: 25 / 75 \%$ to 25\%/3 <br> quarters to 1 quarter / eq; |  |  | 1 |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{7 ( a ) ( i i i )}$ | zero; <br> both parents must be DD / dd <br> parents are sterile / neither parent <br> has d/ recessive allele; <br> lgnore term gene |  | 2 |  |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{7 ~ ( b ) ~}$ | bigger surface area to volume ratio; <br> lack insulation/ fat; <br> lose (more) heat; <br> maintain body temperature; <br> respiration; |  |  | Max 2 |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{8 ( a )}$ | glucose / $\mathrm{C}_{6} \mathrm{H}_{12} \mathrm{O}_{6} ;$ <br> carbon dioxide/ $\mathrm{CO}_{2+}+$ <br> ethanol/alcohol/ $\mathrm{C}_{2} \mathrm{H}_{5} \mathrm{OH} ;$ <br> lgnore energy | chemical <br> symbols |  | 2 (2) |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{8 ( b ) ( i )}$ | gene / DNA / allele (for enzyme); <br> cut; <br> restriction / endonuclease; <br> plasmid / vector / gene gun / phage <br> /virus; <br> ligase; <br> gene / DNA / allele into yeast; |  | Max 4 |  |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{8 ~ ( b ) ( i i ) ~}$ | enzyme / amylase; <br> digests starch / less starch / starch <br> to sugar; |  | 2 |  |

(Total 8 marks)

| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{9}$ | bacteria / named bacteria; <br> ammonia/ ammonium (cpds) to <br> nitrite/ nitrate / nitrite to nitrate; <br> protein / amino acids / growth; |  |  |  |

(Total 3 marks)

| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 0}$ (a) | energy / insulation / cell <br> membranes / neurones / growth / <br> making new cells / eq; | keep warm <br> / eq |  | 1 |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 0 ~ ( b ) ~}$ | respiration / heat / excretion / <br> egestion / movement / uneaten / <br> indigestible;; |  |  | Max 2 |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 0 ( c )}$ | nitrates / mineral ion(s) / named <br> mineral ion(s) / eq; <br> growth of plants / algal bloom; <br> eutrophication; |  |  | Max 5 |
| light blocked / less photosynthesis; <br> death of organisms (plant/ fish); <br> bacteria / microorganisms / eq; <br> oxygen depletion / eq; <br> respiration; |  | (5) |  |  |



| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 1}$ (b) | higher / greater / increase / eq; |  |  | 1 |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 1 ( c ) ( i )}$ | more risk for men up to 28 / <br> similar risk up to 28 / eq; <br> more risk for women (than men) <br> above 28; <br> more risk for men and women <br> above 28; <br> more risk as BMI increases; | allow higher <br> BMI/ overweight <br> as eq to 28 |  | 2 |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 1 \text { (c)(ii) }}$ | coronary artery; <br> fat/ cholesterol blocks/ deposits; <br> (aerobic to) anaerobic; |  |  | Max 5 |
| (less) oxygen; <br> (less) glucose; <br> less respiration / less energy / ATP; <br> lactic acid; <br> builds up / toxic / inhibit enzymes / <br> eq; |  |  |  |  |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 2 ~ ( a ) ~}$ | location; (Bowman's capsule / <br> glomerulus) <br> pressure used; <br> no energy/ ATP required / no active <br> transport; <br> molecules out of blood / into <br> nephron / eq; <br> depends on molecule size / eq; <br> hormones not involved; | converse |  | Max 3 |


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


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 2 ~ ( b ) ( i i ) ~}$ | (less) water reabsorbed; <br> collecting duct; <br> ref permeability; <br> more loss of water / more water in <br> urine / more urine / dilute urine / <br> dehydration / blood concentration <br> increases; | ADH story <br> in <br> converse |  | 4 |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | ---: |
| $\mathbf{1 2 ~ ( c ) ( i ) ~}$ | less pressure / flow speed; <br> larger lumen / eq; <br> closer to surface / easier to see / <br> eq; <br> thinner wall / easier to penetrate; | Converse |  | Max 2 |


| Question <br> Number | Correct Answer | Acceptable <br> Answers | Reject | Mark |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 2}$ (c)(ii) | diffusion; <br> high conc. to low conc. / <br> conc.gradient; |  |  | 2 |

\(\left.$$
\begin{array}{|l|l|l|l|r|}\hline \begin{array}{l}\text { Question } \\
\text { Number }\end{array} & \text { Correct Answer } & \begin{array}{l}\text { Acceptable } \\
\text { Answers }\end{array} & \text { Reject } & \text { Mark } \\
\hline \mathbf{1 2 ~ ( c ) ( i i i ) ~} & \begin{array}{l}\text { urea; } \\
\text { carbon dioxide; } \\
\text { water; }\end{array}
$$ \& \begin{array}{l}toxins / <br>
hormones <br>
/ glucose <br>
lactic <br>

acid\end{array} \& Max 2\end{array}\right\}\)| (2) |
| ---: |

(Total 17 marks)
PAPER TOTAL 90 MARKS

