

# Mark Scheme (Results)

## November 2010

IGCSE

### IGCSE Biology (4325) Paper 2H

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| Question Number   | Answer  | Mark              |               |       |   |         |   |                |   |            |   |     |
|-------------------|---|-------------------|---------------|-------|---|---------|---|----------------|---|------------|---|-----|
| 1                 | <table border="1"> <thead> <tr> <th>Name of structure</th> <th>Order of size</th> </tr> </thead> <tbody> <tr> <td>brain</td> <td>3</td> </tr> <tr> <td>nucleus</td> <td>1</td> </tr> <tr> <td>nervous system</td> <td>4</td> </tr> <tr> <td>nerve cell</td> <td>2</td> </tr> </tbody> </table> <p>4 = 3, 2 = 2 and 1 = 1;;;</p> | Name of structure | Order of size | brain | 3 | nucleus | 1 | nervous system | 4 | nerve cell | 2 | (3) |
| Name of structure | Order of size   |                   |               |       |   |         |   |                |   |            |   |     |
| brain             | 3   |                   |               |       |   |         |   |                |   |            |   |     |
| nucleus           | 1   |                   |               |       |   |         |   |                |   |            |   |     |
| nervous system    | 4   |                   |               |       |   |         |   |                |   |            |   |     |
| nerve cell        | 2   |                   |               |       |   |         |   |                |   |            |   |     |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 2               | bacteria;<br>decomposition / decomposers / decay;<br>oxygen use;<br>respiration;<br>death of organisms / suffocate;<br>mineral ions / named mineral ion / nutrients; Ignore fertiliser<br>growth of algae /growth of plants / eq;<br>eutrophication; | (5)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 3(a)(i)         | iris labelled;<br>pupil labelled;<br>pupil larger in dim light; | (3)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 3(a)(ii)        | muscle; 1 name of muscle<br>contracts / shortens / eq; | (2)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 3(a)(iii)       | more light / eq;<br>allow sight / to see / get image / eq; | (2)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 3(b)            | ciliary muscle;<br>contracts / shortens / eq;<br><br>suspensory ligaments;<br>slacken / relax / eq;<br><br>lens;<br>fattens / eq; | (3)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 4(a)            | haemoglobin;<br>no nucleus;<br>large surface area;<br>biconcave /concave / doughnut / eq;<br>thin (membrane); | (2)  |

| Question Number | Answer                           | Mark |
|-----------------|----------------------------------|------|
| 4(b)(i)         | alternative form of a gene / eq; | (1)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 4(b)(ii)        | Nn and Nn;<br>N and n and N and n;<br>NN, Nn, Nn, nn; | (3)  |

| Question Number | Answer                             | Mark |
|-----------------|------------------------------------|------|
| 4(b)(iii)       | normal and sickled / eq; R carrier | (1)  |

| Question Number | Answer           | Mark |
|-----------------|------------------|------|
| 5(a)            | 2; 4;<br>46; 23; | (4)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 5(b)            | repair / healing / eq;<br>cloning;<br><u>asexual</u> reproduction; | (2)  |

| Question Number | Answer               | Mark |
|-----------------|----------------------|------|
| 5(c)            | gametes;<br>haploid; | (2)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 6(a)            | increases;<br>levels off / drops by a beat / decreases (at 60) / eq; | (2)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 6(b)            | respiration / energy;<br>muscles;<br>oxygen;<br>glucose;<br>adrenaline;<br>(removal of) lactic acid / carbon dioxide; | (4)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 7               | hyphae;<br>(cell) walls;<br>nucleus / mitochondria / ribosomes / eq;<br>yeast;<br>anaerobic;<br>glucose;<br>carbon dioxide; | (17) |

| Question Number | Answer                         | Mark |
|-----------------|--------------------------------|------|
| 8(a)            | fast growing;<br>lots of eggs; | (2)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 8(b)            | grows faster than Chinese; Allow less eggs than Chinese | (1)  |

| Question Number | Answer                                     | Mark |
|-----------------|--|------|
| 8(c)            | selective breeding / artificial selection; | (1)  |

| Question Number | Answer             | Mark |
|-----------------|--------------------|------|
| 9(a)(i)         | pancreas labelled; | (1)  |

| Question Number | Answer                    | Mark |
|-----------------|---------------------------|------|
| 9(a)(ii)        | small intestine labelled; | (1)  |

| Question Number | Answer   | Mark                    |                    |        |           |                                     |                |              |                            |         |          |           |                         |     |
|-----------------|--|-------------------------|--------------------|--------|-----------|-------------------------------------|----------------|--------------|----------------------------|---------|----------|-----------|-------------------------|-----|
| 9(b)            | <table border="1"> <thead> <tr> <th>Large molecule</th> <th>Smaller basic unit</th> <th>Enzyme</th> </tr> </thead> <tbody> <tr> <td>(protein)</td> <td>amino acid / peptide / polypeptide;</td> <td>protease / eq;</td> </tr> <tr> <td>lipid / fat;</td> <td>(fatty acids and glycerol)</td> <td>lipase;</td> </tr> <tr> <td>(starch)</td> <td>(maltose)</td> <td>amylase / carbohydrase;</td> </tr> </tbody> </table> | Large molecule          | Smaller basic unit | Enzyme | (protein) | amino acid / peptide / polypeptide; | protease / eq; | lipid / fat; | (fatty acids and glycerol) | lipase; | (starch) | (maltose) | amylase / carbohydrase; | (5) |
| Large molecule  | Smaller basic unit   | Enzyme                  |                    |        |           |                                     |                |              |                            |         |          |           |                         |     |
| (protein)       | amino acid / peptide / polypeptide;  | protease / eq;          |                    |        |           |                                     |                |              |                            |         |          |           |                         |     |
| lipid / fat;    | (fatty acids and glycerol)   | lipase;                 |                    |        |           |                                     |                |              |                            |         |          |           |                         |     |
| (starch)        | (maltose)  | amylase / carbohydrase; |                    |        |           |                                     |                |              |                            |         |          |           |                         |     |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 9(c)            | <p>large surface area;<br/> microvilli;<br/> thin (walls) / one cell thick;<br/> absorption / diffusion;<br/> capillaries / blood (vessel);<br/> flow of blood / carry /transport /eq;<br/> maintain concentration gradient / eq;<br/> lacteal / lymph (vessel);</p> | (5)  |

| Question Number | Answer | Mark |
|-----------------|--------|------|
| 10(a)(i)        | 3;     | (1)  |

| Question Number | Answer            | Mark |
|-----------------|-------------------|------|
| 10(a)(ii)       | (produce) pollen; | (1)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 10(a)(iii)      | idea that anthers and stigma not close to each other / eq; | (1)  |

| Question Number | Answer                           | Mark |
|-----------------|----------------------------------|------|
| 10(b)(i)        | genetically / DNA;<br>identical; | (2)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 10(b)(ii)       | culture;<br>explants;<br>sterile / aseptic;<br>bacteria / microorganisms / pathogens / viruses;<br>divide / multiply / reproduce; | (5)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 11(a)           | stirs / mixes / moves / spreads / stop (fungus) sinking / eq;<br>temperature / oxygen / air (bubbles) / nutrient / food / fungus / eq; | (2)  |

| Question Number | Answer                           | Mark |
|-----------------|----------------------------------|------|
| 11(b)           | oxygen;<br>respiration / energy; | (2)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 11(c)           | temperature recorder / thermometer / eq;<br>cooling water / cooling jacket; | (2)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 11(d)           | enzymes;<br>optimum / best / specific / narrow range / denatured / destroyed / eq; | (2)  |

| Question Number | Answer      | Mark |
|-----------------|-------------|------|
| 12(a)(i)        | blackbirds; | (1)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 12(a)(ii)       | shape;<br>order;<br>names (even if order wrong); | (3)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 12(b)(i)        | 0.075;;<br>allow one mark for 82 000 or 61.5 in working | (2)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 12(b)(ii)       | energy lost / wasted / used;<br>respiration / movement / heat / excretion / egestion / not digested /<br>eq;;<br>Ignore growth | (3)  |

| Question Number | Answer | Mark |
|-----------------|--------|------|
| 12(c)(i)        | 1999;  | (1)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 12(c)(ii)       | long chain few people / short chain more people;<br>more energy (loss); | (2)  |



| Question Number | Answer   | Mark |
|-----------------|--|------|
| 13(a)           | A Bowman's capsule / renal capsule;<br>B (convoluted/proximal) tubule;<br>C loop of Henle;<br>D collecting duct; | (4)  |

| Question Number | Answer | Mark |
|-----------------|--------|------|
| 13(b)(i)        | A;     | (1)  |

| Question Number | Answer | Mark |
|-----------------|--------|------|
| 13(b)(ii)       | B;     | (1)  |

| Question Number | Answer | Mark |
|-----------------|--------|------|
| 13(b)(iii)      | D;     | (1)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 13(c)(i)        | $28/56 \times 100 = 50\%$ ;;<br>allow 1 mark in working for 56 or 28 | (2)  |

| Question Number | Answer                            | Mark |
|-----------------|-----------------------------------|------|
| 13(c)(ii)       | poisonous / toxic / harmful / eq; | (1)  |

| Question Number | Answer                | Mark |
|-----------------|-----------------------|------|
| 13(c)(iii)      | respiration / energy; | (1)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 13(c)(iv)       | active transport/uptake / selective (reabsorption);<br>against concentration gradient / eq; | (2)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 14(a)           | 6 H <sub>2</sub> O;<br>C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> ; | (2)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 14(b)           | temperature;<br>light intensity;<br>CO <sub>2</sub> (concentration);<br>Ignore wind / water / eq;<br><br>Ignore humidity / rain | (2)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 14(c)           | day: (more) in / less out;<br>(more) light;<br>photosynthesis;<br>idea faster than respiration;<br><br>night: (more) out / less in / CO <sub>2</sub> produced;<br>(less) light;<br>less/no photosynthesis;<br>respiration; | (4)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 15(a)           | sweating;<br>loss of heat / evaporation / cools / eq;<br><br>vasodilation;<br>more blood (to surface) / widening (blood vessels) / eq;<br><br>hairs lie flat;<br>less insulation / less air trapped / less distance / eq; | (4)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 15(b)           | glucose / sugar;<br>water / osmoregulation;<br>salts / eq;<br><br>Ignore heart rate / pH | (2)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 15(c)           | high temperature lowered / too hot, cooled / eq; | (1)  |



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