

**Biology A**

General Certificate of Secondary Education

Unit **A222/01**: Modules B4, B5, B6 (Foundation Tier)

**Mark Scheme for June 2011**

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

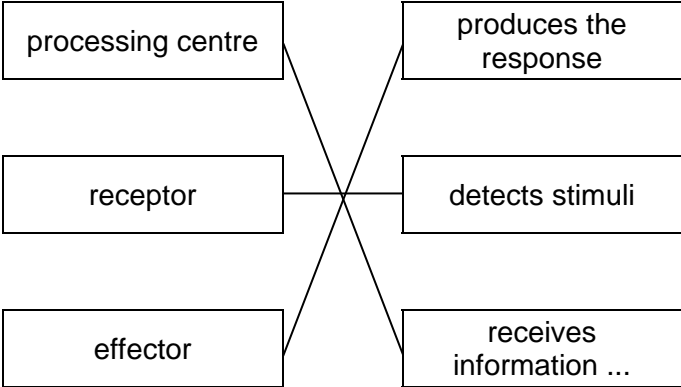
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| Question     |   | Answer  | Mark       | Guidance   |
|--------------|---|---|------------|--|
| 1            | a | maintenance (1)<br>constant (1)   | 2          | responses must be in the correct order                         |
|              | b | incubator (1)   | 1          | <b>accept</b> any clear indication of the correct response     |
|              | c | <p><b>key part of the body control system</b></p>  <p>The diagram shows two columns. The left column is titled 'key part of the body control system' and contains three boxes: 'processing centre', 'receptor', and 'effector'. The right column is titled 'function' and contains three boxes: 'produces the response', 'detects stimuli', and 'receives information ...'. Lines connect 'processing centre' to 'detects stimuli' and 'receives information ...'. Lines connect 'receptor' to 'produces the response' and 'receives information ...'. Lines connect 'effector' to 'produces the response' and 'detects stimuli'.</p> | 2          | 3 correct lines = 2 marks<br><br>1 or 2 correct lines = 1 mark |
| <b>Total</b> |   |   | <b>[5]</b> |  |

| Question     |   | Answer   | Mark       | Guidance  |
|--------------|---|--|------------|---|
| 2            | a | drinking;<br>eating;<br>respiration;   | 2          | 3 correct = 2 marks<br>2 correct = 1 mark<br>1 or 0 correct = 0 marks   |
|              | b | <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 60%;"> <p>excreting urea</p> <p>reabsorbing sugar</p> </div> <div style="width: 30%; text-align: center;"> <input type="checkbox"/><br/> <input checked="" type="checkbox"/><br/> <input type="checkbox"/><br/> <input type="checkbox"/><br/> <input checked="" type="checkbox"/> </div> </div>   | 1          | 2 correct = 1 mark<br><br><b>accept</b> any clear indication of the correct responses                             |
|              | c | <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 60%;"> <p>drinking fluids</p> <p>eating lots of salty food</p> <p>external temperature</p> </div> <div style="width: 30%; text-align: center;"> <input type="checkbox"/><br/> <input checked="" type="checkbox"/><br/> <input checked="" type="checkbox"/><br/> <input checked="" type="checkbox"/><br/> <input type="checkbox"/><br/> <input type="checkbox"/> </div> </div> | 2          | 3 correct = 2 marks<br>1 or 2 correct = 1 mark<br><br><b>accept</b> any clear indication of the correct responses |
| <b>Total</b> |   |  | <b>[5]</b> |   |

| Question     |   | Answer  | Mark       | Guidance   |
|--------------|---|---|------------|--|
| 3            | a | Nick (1)<br>Jill (1)  | 2          |  |
|              | b | <b>enzymes</b> and <b>molecules/substrates</b> collide/hit each other / owtte (1)<br><br>enzymes/molecules/substrates have a complimentary/matching/specific <b>shape</b> (1)<br><br>molecule/substrate <b>fits into</b> the enzyme/active site (1) | 3          | <b>accept</b> chemicals = molecules<br><br><b>accept</b> enzymes have a specific shape so that the substrate/molecule can fit into it = 2 marks<br><br><b>accept</b> 'go into' |
| <b>Total</b> |   |   | <b>[5]</b> |  |
| 4            | a | <div style="text-align: right; margin-right: 20px;"> <input type="checkbox"/><br/> <input type="checkbox"/><br/> <input checked="" type="checkbox"/> </div> ... copies of the same chromosomes. (1)   | 1          | <b>accept</b> any clear indication of the correct response   |
|              | b | 16 (1)  | 1          |  |
|              | c | gametes fuse/carry out fertilisation (forming the zygote) (1)<br>chromosome number must be half so that the original (parental) number is maintained (1)  | 2          | <b>accept</b> join/combine<br><b>ignore</b> meet   |
| <b>Total</b> |   |   | <b>[4]</b> |  |

| Question                           |                   | Answer   | Mark                               | Guidance                               |   |   |   |   |   |   |   |   |   |   |
|------------------------------------|-------------------|--|------------------------------------|--|---|---|---|---|---|---|---|---|---|---|
| 5                                  | a                 | nucleus (1)<br>cytoplasm (1)   | 2                                  | responses must be in the correct order |   |   |   |   |   |   |   |   |   |   |
|                                    | b                 | <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>number of different types of bases</th> <th>number of strands</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>2</td> <td>2</td> </tr> <tr> <td>3</td> <td>3</td> </tr> <tr> <td>4</td> <td>4</td> </tr> </tbody> </table> | number of different types of bases | number of strands                      | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 2 | <b>accept</b> any clear indication of the correct responses |
| number of different types of bases | number of strands |  |                                    |  |   |   |   |   |   |   |   |   |   |   |
| 1                                  | 1                 |  |                                    |  |   |   |   |   |   |   |   |   |   |   |
| 2                                  | 2                 |  |                                    |  |   |   |   |   |   |   |   |   |   |   |
| 3                                  | 3                 |  |                                    |  |   |   |   |   |   |   |   |   |   |   |
| 4                                  | 4                 |  |                                    |  |   |   |   |   |   |   |   |   |   |   |
| <b>Total</b>                       |                   |  | <b>[4]</b>                         |  |   |   |   |   |   |   |   |   |   |   |

| Question     |   | Answer  | Mark       | Guidance  |
|--------------|---|---|------------|---|
| 6            | a | meristem (1)  | 1          | <b>accept</b> phonetic spelling<br><b>ignore</b> stem cells |
|              | b | hormones (1)  | 1          |   |
|              | c | root(s) (1)   | 1          |   |
|              | d | <p style="text-align: center;"> <input type="checkbox"/><br/>                     phototropism <input checked="" type="checkbox"/> (1)<br/> <input type="checkbox"/><br/> <input type="checkbox"/> </p> | 1          | <b>accept</b> any clear indication of the correct response  |
|              | e | leaves can get <b>more</b> light / owtte (1)<br><b>increased</b> photosynthesis /<br>(plants/it/they/leaves/chloroplasts can) produce <b>more</b><br>food/glucose (1)<br>to grow (1)                    | 3          | <b>ignore</b> references to growing towards the light       |
| <b>Total</b> |   |   | <b>[7]</b> |   |

|              |          |   |            |                                 |           |          |              |          |          |          |   |  |
|--------------|----------|---|------------|---------------------------------|-----------|----------|--------------|----------|----------|----------|---|--|
| 7            | a        | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>axon</td> <td><b>B</b></td> </tr> <tr> <td>cytoplasm</td> <td><b>D</b></td> </tr> <tr> <td>fatty sheath</td> <td><b>C</b></td> </tr> <tr> <td>membrane</td> <td><b>A</b></td> </tr> </table> | axon       | <b>B</b>                        | cytoplasm | <b>D</b> | fatty sheath | <b>C</b> | membrane | <b>A</b> | 2 | 4 correct responses = 2 marks<br>3 or 2 correct responses = 1 mark |
| axon         | <b>B</b> |   |            |                                 |           |          |              |          |          |          |   |  |
| cytoplasm    | <b>D</b> |   |            |                                 |           |          |              |          |          |          |   |  |
| fatty sheath | <b>C</b> |   |            |                                 |           |          |              |          |          |          |   |  |
| membrane     | <b>A</b> |   |            |                                 |           |          |              |          |          |          |   |  |
|              | b        | i 20 (1)  | 1          |                                 |           |          |              |          |          |          |   |  |
|              |          | ii insulation (1)   | 1          |                                 |           |          |              |          |          |          |   |  |
|              | c        | synapse (1)   | 1          | <b>accept</b> phonetic spelling |           |          |              |          |          |          |   |  |
| <b>Total</b> |          |   | <b>[5]</b> |                                 |           |          |              |          |          |          |   |  |

| Question     |   | Answer  | Mark       | Guidance   |
|--------------|---|---|------------|--|
| 8            | a | memory;<br>language development;<br>intelligence;   | 2          | 3 correct responses = 2 marks<br>2 correct responses = 1 mark<br>1 or 0 correct responses = 0 marks<br>more than 3 responses deduct 1 mark for each extra response |
|              | b | <b>any two from:</b><br>use an MRI scan/CT scan/CAT scan;<br>study patients with brain damage;<br>use electricity to stimulate different parts of the brain;  | 2          | <b>ignore</b> brain scan   |
| <b>Total</b> |   |   | <b>[4]</b> |  |
| 9            |   | <b>new</b> (neuron) pathways form (in the brain) / owtte (1)<br>certain pathways (in the brain) are <b>more likely</b> to transmit impulses than others / used <b>more often</b> (1)<br><br>repetition <b>reinforces/strengthens</b> (new) pathways (1) | 3          | <b>accept</b> more pathways form/created/accessed/made<br><br><b>accept</b> a suitable example of a description of repetition if linked to reinforces/strengthens  |
| <b>Total</b> |   |   | <b>[3]</b> |  |



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