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# Mark Scheme (Results)

## June 2014

## Pearson Edexcel International GCSE Human Biology (4HB0/02)

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## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

| Question number | Answer | Comments | Marks |
|---|---|---|---|
| 1 (a) (i) | C humerus;<br>D rib/ribcage;<br>F clavicle; | Accept collar bone | **(3)** |
| (ii) | Two from<br><br>D<br>E<br>G;; | Allow:<br>Ribs<br>Skull<br>Vertebrae | **(2)** |
| (b) (i) | • tendon joins muscle to bone;<br>• cartilage stops bones from rubbing together/reduces friction/shock absorber/cushions impact;<br>• synovial fluid aids movement (at joint)/lubricant; | Credit reduces friction if not already awarded for cartilage | **(3)** |
| (ii) | • movement is in one plane;<br>• movement is up and down/back and forward/180$^{o}$; | | **(2)** |

**(Total for Question = 10marks)**

| Question number | Answer | Comments | Marks |
|---|---|---|---|
| 2 (a) (i) | label to trachea below voice box; | | **(1)** |
| (ii) | Three from<br><br>• rings of cartilage;<br>• keeps trachea open/means it doesn't collapse (under pressure changes)/helps to keep its shape;<br>• lining secretes mucus;<br>• traps bacteria/dust/dirt;<br>• presence of cilia;<br>• to remove mucus; | Must be linked to cilia | **(3)** |
| (b) (i) | • (muscles of) diaphragm contract;<br>• diaphragm flattens/from dome-shaped to flattened; | Ignore moves down | **(2)** |
| (ii) | Two from<br><br>• volume of thorax increases;<br>• pressure (inside lungs) decreases;<br>• air moves into lungs down a pressure gradient/difference in pressure forces air into lungs; | | **(2)** |
| (c) | • ask a person to blow into limewater/bicarbonate indicator;<br>• turns limewater cloudy/bicarbonate indicator red to yellow;<br>• pump/pass (atmospheric) air into limewater and it should stay clear/into bicarbonate indicator should stay red; | | **(3)** |

**(Total for Question = 11marks)**

| Question number | Answer | Comment | Marks |
|---|---|---|---|
| 3(a) (i) | Three from<br><br>• breakdown/digest/decompose;<br>• harmful/organic material (in sewage);<br>• to harmless (inorganic) compounds;<br>• reduces risk of disease; | <br><br>Allow rots | **(3)** |
| (ii) | fertiliser; | | **(1)** |
| (b) | Four from :<br><br>• increase risk of disease/example of disease e.g. typhoid/cholera;<br><br>• sewage contains organic material/nitrates;<br>• causes excessive algal growth/algal bloom;<br>• (broken down by) bacteria/microorganisms/ decomposers;<br>• which carry out (aerobic) respiration;<br>• use up oxygen/oxygen depletion;<br>• fish/aquatic animals die; | <br><br><br><br><br><br><br><br>Ignore suffocate | **(4)** |

**(Total for Question = 8marks)**

| Question number | Answer | Comments | Marks |
|---|---|---|---|
| 4 (a) | • cornea;<br>• refracts/bends light/focuses light on retina;<br>• iris;<br>• controls the amount of light entering the eye; | Accept accommodation | **(4)** |
| (b) | cerebrum/cerebral hemispheres; | | **(1)** |
| (c) | • vision would become blurred/ not see as clearly;<br>• because rays of light would not focus on the retina/light receptors/would focus behind the retina/light receptors; | | **(2)** |
| (d) | C conduct experiment with two eyes and also with just one eye;<br>O use same person/people of similar age/eye conditions;<br>R idea of repetitions/use many people;<br>M sensible way of determining the effectiveness of stereoscopic vision e.g. catching a ball;<br>S control e.g. lighting in room; | | **(5)** |

**(Total for Question = 12marks)**

| Question number | Answer | Comment | Marks |
|---|---|---|---|
| 5 (a) (i) | motor; | | **(1)** |
| (ii) | away from receptor; | | **(1)** |
| (iii) | synapse/synaptic cleft; | | **(1)** |
| (b) (i) | • speed of impulse increases as the diameter increases;<br>• increase gets smaller the larger the diameter/increase not proportional/consistent; | Accept appropriate use of data | **(2)** |
| (ii) | • unreliable;<br>• no evidence of repeats; | Accept unable to identify anomalous results; | **(2)** |
| (c) | • myelinated nerves are insulated;<br>• impulse jumps from one node of Ranvier to the next/prevents loss of impulse; | | **(2)** |

**(Total for Question = 9marks)**

| Question number | Answer | Comments | Marks |
|---|---|---|---|
| 6 (a) | Two from:<br><br>• kidneys involved in excretion/blood not filtered;<br>• (if not treated) waste products build up/waste not removed;<br>• poisonous/toxic;<br>• urea main waste product; | | **(2)** |
| (b) | Four from:<br><br>Transplant:<br><br>• long term solution;<br>• quality of life is better;<br>• survival rate is better;<br>• able to work;<br>• not having to spend so much time undergoing dialysis/fewer hospital visits;<br><br>Dialysis:<br><br>• as there is a shortage of organs;<br>• difficulty in finding a matching donor;<br>• less/no side effects;<br>• transplant involves an operation which has risks;<br>• risk of rejection of transplanted kidney; | Marks can be obtained from one area or both.<br><br>Reference to infection for either transplant or dialysis allowed once. | **(4)** |
| (c) | Four from:<br><br>• AB is the universal recipient;<br>• does not have the a antibody or the b antibody/no antibodies;<br>• with no relevant antibody there will be no agglutination/reaction;<br><br>• AB contains A antigen and B antigen;<br>• will react with the a antibody in blood group B/b antibody in blood group A/a and b antibodies in blood group O; | | **(4)** |

**(Total for Question = 10marks)**

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