

| Question Number | Answer   |                             |
|-----------------|--|-----------------------------|
| 5 (b)(ii)       | <p>Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme.</p> <p>The indicative content below is not prescriptive and candidates are not required to include all the material indicated as relevant. Additional content included in the response must be scientific and relevant.</p> <ul style="list-style-type: none"> <li>• classification definitions historically based on similarities and differences in phenotype</li> <li>• some examples of phenotypes used for previous classification, e.g. beak shape, bird size, diet, habitat</li> <li>• previous classification had <i>Ceyx madagascariensis</i> as more closely related to other <i>Ceyx</i> kingfishers</li> <br/> <li>• more recent classification based on molecular evidence / molecular phylogeny</li> <li>• similarities and differences in mRNA / DNA / amino acid sequences identified</li> <li>• explanation of how they are compared</li> <br/> <li>• fewer differences means they are more closely related / have more recent common ancestor</li> <li>• reference to closer together on evolutionary tree</li> <li>• proposed classification had <i>Ceyx madagascariensis</i> as more closely related to <i>Alcedo</i> (<i>leucogaster</i> and / or <i>cristata</i>)</li> <br/> <li>• scientist proposing a reclassification</li> <li>• published in scientific journal</li> <li>• reference to peer review (of molecular evidence)</li> <br/> <li>• repetition of experiments by other scientists (to see if same data are collected)</li> <li>• extend the analysis e.g. look for similarities / differences in more genes</li> <li>• analysis of data to see if same conclusions can be reached / more research</li> <li>• statistical analysis</li> </ul> | <b>(6)</b><br><b>Expert</b> |

|         |     |   | Additional guidance  |
|---------|-----|---|--|
| Level 0 | 0   | No awardable content  |  |
| Level 1 | 1-2 | <p>An explanation may be attempted but with limited interpretation or analysis of the scientific information and with a focus on mainly just one piece of scientific information.</p> <p>The explanation will contain basic information, with some attempt made to link knowledge and understanding to the given context.</p>       | <p>1 mark - information from one section</p> <p>2 marks - information from two sections</p>  |
| Level 2 | 3-4 | <p>An explanation will be given, with occasional evidence of analysis, interpretation and/or evaluation of both pieces of scientific information.</p> <p>The explanation shows some linkages and lines of scientific reasoning, with some structure.</p>  | <p>3 marks - information from three sections</p> <p>4 marks - information from four sections</p>   |
| Level 3 | 5-6 | <p>An explanation is made that is supported throughout by sustained application of relevant evidence of analysis, interpretation and/or evaluation of both pieces of scientific information.</p> <p>The explanation shows a well-developed and sustained line of scientific reasoning, which is clear and logically structured.</p> | <p>5 marks - information from five sections</p> <p>6 marks - Information from all six sections applied to the given context showing a good understanding of the review process leading to an accepted reclassification by the scientific community</p> |