

## BIOLOGY BY2

| Question |      | Marking details  |  |  |                     | Marks Available |   |
|----------|------|--|--|--|---------------------|-----------------|---|
| 1.       | (a)  |  | Kingdom  | Phylum   | Class               | Genus           | 4 |
|          |      |  | Planta(e)/<br>plant(s);  |  |                     |                 |   |
|          |      |  |  | Annelid(s)/<br>annelida                              |                     |                 |   |
|          |      |  |  | Vertebrate/<br>vertebrata/<br>chordate/<br>chordata; |                     |                 |   |
|          |      |  |  |  | Insect/<br>insecta; |                 |   |
|          | (b)  | (i)  | A = Fungi;<br>B = Protocist(a)/ protocists/ protists; NOT protozoa |  |                     |                 | 2 |
|          | (ii) | A (reproduce by) spores/ hyphae/ mycelium/ chitin walls/<br>heterotrophic/ saprophytic/ eukaryotic;<br>Accept description of saprophytic<br>B membrane bound organelles present/ eukaryotic/ no<br>tissue differentiation/ (mainly) single celled organisms/<br>unicellular; |  |  |                     | 2               |   |
|          |      | <b>Question 1 total</b>  |  |  |                     | <b>[8]</b>      |   |

| Question                |     | Marking details  | Marks Available   |       |
|-------------------------|-----|--|---|-------|
| 2.                      | (a) | loss of water <u>vapour/ evaporation</u> of water;<br>from (surface of) leaf /through stomata; Accept lenticels  | 2   |       |
|                         | (b) | (i) TWO precautions and TWO reasons <ul style="list-style-type: none"> <li>• Shoot cut under water/inserted under water/flood inside of apparatus with water/ assemble under water;<br/>to prevent air entering/ bubbles;</li> <li>• Shoot with large number of leaves;<br/>to ensure measurable rate of transpiration;</li> <li>• Avoid wetting leaves/ ensure leaves are dry;<br/>blocks stomata/ reduces rate of transpiration;</li> <li>• Leave time for apparatus to settle down;<br/>allow plant to adapt to new conditions/ to equilibrate;</li> <li>• Seal joints with Vaseline/ ensure screw clip is closed;<br/>to prevent air entering apparatus/ prevent leakage;</li> <li>• Ensure bubble set at appropriate position/ right hand end;<br/>to enable a (suitable) reading to be taken;</li> </ul> Reference to not allowing air bubbles to enter = 1 mark<br>( if no precautions are given) | 4 max   |       |
|                         | (c) | (i)  | Sun(light);   | 1     |
|                         |     | (ii)   | Molecules of water moving together/ water pulled up;<br>Because of <u>cohesion</u> of <u>molecules</u> ;<br><u>adhesion</u> to (walls of) { <u>xylem</u> / hydrophilic lining/ vessel wall};<br>root pressure {forces/ pushes} water upwards;<br>IGNORE capillarity | 2 max |
|                         | (d) | (i)  | A= phloem;<br>B= xylem;   | 2     |
|                         |     | (ii)   | {Xylem/ vascular <u>tissue</u> } is at the centre/ xylem is star shaped/ central stele; NOT bundle<br>No vascular <u>bundles</u> / peripheral vascular <u>bundles</u> in stem;<br>Endodermis visible in root/ no pith;  | 2 max |
| <b>Question 2 total</b> |     |  | <b>[13]</b>   |       |

| Question                |  | Marking details   | Marks Available   |   |
|-------------------------|--|---|---|---|
| 3.                      | (a)  | <p>Any 4<br/>Intercostal muscles <u>contract and</u> ribs move <u>up and out</u>;</p> <p>Diaphragm (muscles) <u>contract and</u> diaphragm <u>flattens</u>;</p> <p>(Internal) volume of <u>thorax</u> increases;<br/>accept chest reject lungs</p> <p>Pressure in lungs/ thorax decreases;</p> <p>{Higher/ <u>difference</u> in} air <u>pressure</u> outside {forces/ pushes/ moves/ drawn} air into lungs;</p> | 4   |   |
|                         | (b)  | (i)   | <p>blood flows across (gills/ filaments/ lamellae/ gill plates) in opposite direction to water;<br/>water always has more oxygen than blood/ (oxygen) {diffusion/ concentration} gradient maintained;<br/>oxygen passes from water into blood;<br/>across entire {gill/ gas exchange} surface; NOT longer higher saturation of blood with oxygen/ more oxygen taken up;</p> | 4 |
|                         |  | (ii)  | <p>Parallel (flow);</p>   | 1 |
|                         |  | (iii)   | <p>Equilibrium is reached (part way across the gill plates/ lamellae)/{diffusion/ concentration} gradient not maintained;<br/>{Lower percentage saturation with/ <u>only</u> 50% saturation} oxygen/ less oxygen uptake/ less diffusion of oxygen; NOT slower</p>   | 2 |
| (c)                     | <p>gills dry out;<br/>prevents oxygen from dissolving on surface of gills;</p> <p>gills may {stick together/not open as easily/ collapse};<br/>decrease in surface area;</p> <p>(Explanation cannot be accepted alone)</p> | 2 max   |   |   |
| <b>Question 3 Total</b> |  |   | <b>[13]</b>   |   |

| Question |                         | Marking details   | Marks Available |
|----------|-------------------------|---|-----------------|
| 4.       | (a)                     | (i) C/ D;   | 1               |
|          |                         | (ii) K <u>and</u> F;  | 1               |
|          |                         | (iii) C;  | 1               |
|          |                         | (iv) E;   | 1               |
|          |                         | (v) F;  | 1               |
|          |                         | (vi) J;   | 1               |
|          | (b)                     | (i) Herbivorous/ herbivore;   | 1               |
|          |                         | (ii) { <u>large/ridged/WM shape</u> } { <u>molars/premolars</u> } for <u>grinding</u> ;<br><br>{ <u>diastema/space with no teeth/ gap between teeth</u> } to assist with { <u>chewing/ (tongue to) manipulate food/ cud</u> };<br><br>{ <u>well developed/ sharp/ long</u> } incisors for { <u>biting/ cutting/ slicing/ tearing</u> } (vegetation);<br><br>loose articulation/ jaw moves in a {horizontal/ circular} plane;<br><br>Very small/ no canines;<br><br>open roots to allow continuous growth of molars; | 3max            |
|          |                         | (iii) Four <u>chambered</u> stomach (NOT four stomachs) / rumen/ large caecum;<br>Contain cellulose digesting bacteria/ have cellulase producing bacteria; NOT cellulose eating bacteria<br>Long gut {to allow extra time for digestion of cellulose/ cellulose harder to digest};<br>Cud is regurgitated for further chewing;  | 2               |
|          | <b>Question 4 Total</b> |   | <b>[12]</b>     |

| Question |     | Marking details   | Marks Available |
|----------|-----|---|-----------------|
| 5.       | (a) | Parasites (are organisms that) live {on/ in} {another organism/ host} <u>and</u> obtain {nourishment/ nutrients} from it;<br>at the expense of /causing harm to the host;   | 2               |
|          | (b) | attaches to gut wall by {hooks <u>and</u> suckers/ scolex};<br><u>{large/ high/ increased} surface area to volume ratio</u> ;<br>{digested products/ nutrients} in host gut absorbed into tapeworm;<br>short diffusion pathway; | 3 max           |
|          |     | <b>Question 5 Total</b>   | <b>[5]</b>      |

| Question                |     |   | Marking details   | Marks Available |
|-------------------------|-----|---|---|-----------------|
| 6.                      | (a) | (i)   | sucrose is produced in (photosynthesising) leaf/ leaves are the source of sucrose;<br>sucrose travels in phloem;<br>phloem removed (by the ringing process);<br>sucrose cannot flow to roots/ is blocked; | 3 max           |
|                         |     | (ii)  | amino acids/hormones/ florigen;   | 1               |
|                         | (b) | sucrose used for {cell wall formation/ cell division/ mitosis/ respiration};<br>{Less/ no} sucrose used (by growing areas/sinks as they have been removed);<br>therefore more will pass down stem; NOT accumulation | 2 max   |                 |
|                         | (c) | sucrose not replaced from above (the ring);<br>so concentration decreases;<br>as movement towards root continues;<br>and sucrose used in respiration/storage/ converted to starch/ growth/ active transport;        | 3 max   |                 |
| <b>Question 6 Total</b> |     |   |   | <b>[9]</b>      |

| Question |     | Marking details   | Marks Available |
|----------|-----|---|-----------------|
| 7.       | (a) | <p>(i)</p> <p>Fish/ amphibians</p> <ul style="list-style-type: none"> <li>A. Fish/ amphibians show external fertilisation;</li> <li>B. Fertilised {egg/ zygote/ embryo} develops outside body of parent;</li> <li>C. Many eggs/ young produced;</li> <li>D. Ensures some survive;</li> </ul> <p>Reptiles/ birds mammals</p> <ul style="list-style-type: none"> <li>E. Reptiles / Bird / Mammals internal fertilisation;</li> <li>F. This allows gametes to be independent of water;</li> <li>G. Increased chance of fertilisation/ fewer gametes {needed/ wasted};</li> </ul> <p>Reptiles/ birds</p> <ul style="list-style-type: none"> <li>H. (Evolution of an) amniote egg;</li> <li>I. eggs surrounded by protective shell/ preventing dessication;</li> </ul> <p>mammals</p> <ul style="list-style-type: none"> <li>J. Birds incubate eggs outside mothers body;</li> <li>K. Mammals – development inside mothers body;</li> <li>L. Nutrients/ oxygen via placenta;</li> <li>M. Young born well developed;</li> <li>N. Birds/ mammals exhibit parental care;</li> <li>O. Relationship between parental care and number of offspring produced;</li> </ul> <p><b>Question 7 Total</b></p> | [10]            |

| Question | Marking details  | Marks Available |
|----------|--|-----------------|
| (b)      | <p>A. wall consists of three layers/ diagram of artery + vein labelled correctly;</p> <p>B. <u>smooth endothelial</u> (lining);</p> <p>C. to reduce friction;</p> <p>D. {outer layer/ tunica externa} of <u>collagen</u> ( can be on diagram)</p> <p>E. to resist/prevent overstretching;</p> <p>F. artery has a thick wall to resist pressure;</p> <p>G. contain a <u>thick</u> layer of <u>elastic</u> tissue;</p> <p>H. { for <u>elastic recoil/ small lumen</u>} to maintain pressure;</p> <p>I. Smooth muscles in {small arteries/ arterioles} {regulate blood flow/pressure/ ref to vasoconstriction};</p> <p>J. arteries closer to the heart have more elastic tissue;</p> <p>K. semilunar valves in aorta/ pulmonary artery;</p> <p>L. Veins have valves to {<u>prevent backflow of blood/ to maintain unidirectional flow</u>};</p> <p>M. Walls are thin(ner) because blood at lower pressure;</p> <p>N. (skeletal) muscle contraction returns blood to heart;</p> <p>O. Large lumen reduces resistance to flow/ friction;</p> <p><b>Question 7 Total</b></p> | <p>[10]</p>     |