

**Model Answers: Easy**

1a

(a) The Venus flytrap (*Dionaea muscipula*) plant is a carnivorous plant because:

- It gets its supply of nitrogen / phosphorus compounds by trapping and digesting small animals (mainly insects and arachnids); [1 mark]

**[1 mark]**

Strictly speaking, the Venus flytrap should be called omnivorous because it does still make its own food (carbohydrates) by photosynthesis, as well as digesting animals for their mineral content. This enables the plant to grow on mineral-deficient soils. The 'carnivorous' label that is often attached to this species is a little glamourised because of the unusual, varied nature of its diet!

1b

(b) The events that lead to a Venus flytrap closing to entrap its prey are:

Any **three** from the following:

- Prey is attracted by nectar inside the flytrap; [1 mark]
- Prey touches the sensory hair inside the lobes; [1 mark]
- Calcium channels at the base of the hair are activated; [1 mark]
- Two touch stimuli are required (within 30 seconds) to generate action potentials across the flytrap; [1 mark]
- Action potentials cause elastic tension in the lobes to be released, causing them to close; [1 mark]

**[Total: 3 marks]**

1c

(c) (i) The principle group of proteins that allow cell elongation under the effects of auxins is:

- Expansins; [1 mark]

(c) (ii) Their principal mode of action is:

- To loosen the bonds between cellulose microfibrils in the cell wall (allowing expansion/elongation); [1 mark]

**[Total: 2 marks]**

1d

(d) The events that cause the cell to elongate are:

- Caused by potassium channels opening and allowing  $K^+$  into the cell / cytoplasm; [1 mark]
- Water follows by osmosis and (the increased pressure) stretches the cell / makes it longer; [1 mark]

**[Total: 2 marks]**

2a

(a) The two processes that are controlled by gibberellins in plants are:

- (Seed) germination; [1 mark]
- Stem elongation; [1 mark]

*Allow: cell division in the stem*

**[Total: 2 marks]**

2b

(b) Farmers have to keep harvested barley seeds cool and dry because:

