Department: BIOLOGY

Title of Exam: Animal and plant biology Part 1

Time Allowed: 1 hour and 30 minutes

Allocation of Marks:
Total marks available for this paper: 50
The marks available for each question are indicated on the paper.

Instructions for Candidates:
Answer all questions in the spaces provided on the examination paper

For marker use only:

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Do not write on this booklet before the exam begins
Do not turn over this page until instructed to do so by an invigilator
1. a) What did Darwin mean by the “abominable mystery”? (2 marks)

b) Provide one explanation, backed up with evidence, that could help resolve the “abominable mystery”. (3 marks)

2. Describe a pollination strategy and explain how it promotes outbreeding. (4 marks)
3. Draw a simple diagram to explain the alternation of generations in plants. (4 marks)

4. Describe an example of persistence and multiplication in flowering plants and explain the advantages of the reproductive strategies used. (3 marks)
5. Describe a mechanism by which plants defend themselves against viruses.  

(4 marks)

6. Explain the physiological adaptations that lead some chilli plants in wild populations to produce pungent fruit while others do not.  

(5 marks)
7. a) Briefly explain the processes in C4 photosynthesis that result in suppression of photorespiration. 

(4 marks)

b) Give one reason why C4 plants are prevalent in warm, drier places. Explain your answer. 

(3 marks)
8. a) Plants do not photosynthesize below ground, as a rule, and the roots are therefore a net carbon sink. Give 2 examples of compounds, processes or structures below ground on which the plant “spends” carbon, and say what the benefit is to the plant. (4 marks)

b) A researcher works on 2 closely related varieties of french bean. Variety A has a consistently larger leaf area than Variety B, even where growing conditions are the same. Briefly describe an additional measurement the researcher could make to compare the two varieties, and explain how that would help her discover what causes the difference. (3 marks)
9. a) Describe how physical stimuli are converted into electrical signals during sensory transduction at a simple sensory receptor. (4 marks)

b) How is the strength of the stimulus encoded? (2 marks)

c) Explain how axon myelination increases the speed of action potential propagation. (4 marks)

d) What other advantage does axon myelination provide? (1 mark)

End of Exam