Answer ONE question from this section. 002393/F 2003

1. (a) (i) Describe TWO similarities and TWO differences between the processes of diffusion and osmosis.

(ii) Describe ONE way, in EACH case, in which diffusion is involved in photosynthesis AND mammalian respiration.

(b) (i) Suggest TWO ways in which cigarette-smoking affects the efficiency of the diffusion process in human respiration.

(ii) Cigarette smoking has been banned in many public places. Do you think this is necessary? Give THREE reasons for your answer.

(iii) Some plants can survive in areas where air pollution is high. Suggest ONE characteristic which leaves of such plants might show. Explain how the characteristic you suggested could be helpful.

Total 20 marks

2. (a) (i) Breast milk is described as a complete food for babies. What should it contain if this statement is to be true?

(ii) Babies fed on powdered milks tend to gain weight more rapidly than breast fed babies. Suggest TWO reasons why this may be so.

(b) (i) Explain the process by which the composition of blood is returned to normal after drinking excessive quantities of water.

(ii) A woman’s urine contained a lot of sugar, although she rarely ate sweet foods.
Explain FULLY, the changes she should make to her diet AND why?  

(9 marks)

(c) Several advertisements seen on TV advise people that if they use certain products, they “can eat whatever they want” without putting on weight.

(i) Suggest how these products work.

(ii) Discuss ONE possible disadvantage of using such products.  

(4 marks)

Total 20 marks

SECTION B. Answer ONE question from this section.

3. (a) Use PAIRS of diagrams to show TWO important differences between mitosis and meiosis.  

(6 marks)

(b) (i) State the meaning of the term ‘phenotype’.

(ii) When two white-flowered plants were crossed they produced offspring as follows:

25 white-flowered plants  
9 purple-flowered plants

From these results, is it possible that EITHER of the parents is pure-breeding (homozygous) for flower colour? Fully explain your answer using appropriate symbols.  

(8 marks)
(c) In developed countries like the United States, genetic engineering methods are being used to fight plant diseases and improve agricultural products.

(i) Use your knowledge of Biology to explain TWO reasons why there is a growing emphasis on manipulating genes.

(ii) Suggest TWO possible disadvantages for regions like the Caribbean, if this trend continues.

(6 marks)

Total 20 marks

4. (a) (i) With the aid of a diagram, show the internal structure of a seed of a dicotyledon.

(ii) Describe THREE changes that take place WITHIN the seed during germination.

(6 marks)

(b) You transplanted several vegetable seedlings from seed boxes to a plot of land beside a small stream. Your seedlings grew well but you were advised to add fertiliser to the soil before the plants flowered.

(i) Suggest TWO benefits you would expect from applying fertiliser to the soil as advised?

(ii) Suggest THREE factors that you would consider in deciding whether to use a natural or artificial fertiliser.

(8 marks)

(c) You were advised to spray the plants with insecticide every four weeks. Explain THREE advantages and THREE disadvantages of such a practice.

(6 marks)

Total 20 marks
SECTION C. Answer ONE question from this section.

5. (a) (i) State FOUR observable characteristics that can be used to classify plants in a grassy field.

(ii) Give TWO reasons why you think it is important to classify organisms. (6 marks)

(b) In a natural habitat, such as a grassy field or a pond, there is usually a great variety of plants and animals.

(i) Give examples of TWO different types of feeding relationships that are common to many habitats.

(ii) Explain why different types of organisms are important to maintain life in a habitat. (6 marks)

(c) Explain the term ‘response’ and discuss why the ability to respond is important for the survival of organisms in a natural habitat. In your discussion, refer to ONE example of response in animals and ONE example in plants. (8 marks)

Total 20 marks

6. (a) Briefly explain the difference between a deficiency disease and a physiological disease. Give ONE example of EACH in your explanation. (4 marks)

(b) Two boys were admitted to hospital with the same symptoms; both were anaemic and tired easily. After receiving injections with high concentrations of iron, one boy improved. Investigations revealed that other family members of the boy who did NOT recover, had similar problems and an uncle had died as a young child, after suffering in the same way.

(i) Explain why iron injections were given AND why the first boy improved when he received them . (10 marks)

(ii) What type of disorder may have caused the symptoms of the boy who did NOT improve and how would you explain clearly to his parents why they were not ill?

(c) It has been argued that diseases like diabetes and hypertension, which are sometimes called “lifestyle” diseases, are an unnecessary burden to the society.

(i) Do you agree with this statement? Explain your answer fully.

(ii) Describe TWO steps that people might take to reduce the incidence of such diseases. (6 marks)
Total 20 marks