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SECTION A

Answer any THREE questions in this section.

If you answer Question 1, put a cross in this box .

1. The condition known as diabetes is identified by the presence of glucose in the urine.

(a) (i) Describe how you would test a sample of urine for the presence of glucose.

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(ii) Suggest why a person with diabetes may have glucose in their urine.

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(b) Describe and explain **two** ways in which water is used in the body other than in the formation of urine.

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If you answer Question 2, put a cross in this box .

2. A potato consists largely of water and approximately 20% starch.

(a) (i) Describe how you would test for the presence of starch in a potato.

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(iii) Describe how cells of the body use the products of starch digestion.

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(b) Suggest and explain why a person who only eats potatoes for their diet would soon become unwell.

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(Total 20 marks)

Q2

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(b) All cells contain enzymes.

(i) Describe the structure of an enzyme.

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(ii) Explain why temperatures higher than 70 °C may lead to a change in the functions of an enzyme.

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If you answer Question 4, put a cross in this box ☒ .

4. Chromosomes are found in the nucleus of a cell and are involved in the inheritance of a person's characteristics.

(a) (i) Describe the structure of a chromosome.

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(ii) Explain how a person's chromosomes determine their characteristics.

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(b) A man who is normal for blood clotting and a woman who is a carrier for the haemophilia allele have a male child.

(i) What is the chance that this male child will have haemophilia? In your answer, draw a genetic diagram and use the symbol X^H to represent the allele for normal blood clotting and the symbol X^h to represent the allele for haemophilia.

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(ii) Suggest why it is unlikely that females have the condition of haemophilia.

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(c) The blood group of a human is determined by the presence of two of the alleles I^A , I^B or I^o , inherited from their parents.

Explain how two parents who are both blood group B can produce a child who is blood group O.

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If you answer Question 5, put a cross in this box .

5. Urea is a waste product. It is produced in the liver and excreted by the kidneys.

(a) (i) Explain why urea is made.

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(ii) Describe the route taken by the urea in passing from the liver to the kidneys. Do not include details of its passage through the heart.

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SECTION B

Answer any TWO questions in this section.

If you answer Question 6, put a cross in this box .

6. (a) Describe how each of the following helps protect the body against disease.

(i) Phagocytosis

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(ii) Antibodies

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(iii) Blood clotting

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(b) Describe how a person can gain artificial immunity to a disease.

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If you answer Question 7, put a cross in this box .

7. Pollution of ponds and rivers by sewage can be harmful to both humans and fish.

(a) Explain how raw sewage in a river can be harmful to human health.

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If you answer Question 9, put a cross in this box ☒ .

9. Pit latrines are used in some places for the disposal of faeces and urine. The pit latrines are situated in small villages or near isolated houses. It is important that the soil is permeable and they are at least 30 metres from wells.
- (a) Describe the structure of a pit latrine. Draw a large labelled diagram to illustrate your answer.

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(b) (i) Explain why it is best to build pit latrines in permeable soil.

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(ii) Explain why it is best to build pit latrines at least 30 metres from wells.

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(c) Suggest why disinfectant should not be poured into a pit latrine.

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(d) Suggest why pit latrines may be unsuitable for use in large towns.

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Q9

(Total 20 marks)

TOTAL FOR SECTION B: 40 MARKS

TOTAL FOR PAPER: 100 MARKS

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