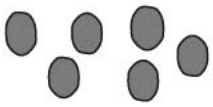
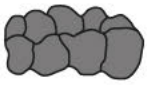
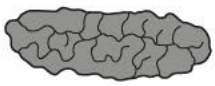
1 The Bristol scale is used to classify human faeces. It is used to help diagnose patients who have problems with their alimentary canal.

Type 1		separate hard lumps, like nuts
Type 2		sausage-shaped but lumpy
Type 3		like a sausage but with cracks on the surface
Type 4		like a sausage, smooth and soft
Type 5		soft blobs with clear-cut edges
Type 6		fluffy pieces with ragged edges
Type 7		watery, no solid pieces

(a) Suggest why a patient might produce **Type 1** faeces.

(1)

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(b) Suggest why a patient might produce **Type 7** faeces.

(1)

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(c) Describe how food is moved through the gut.

(3)

(d) Name the part of the gut where faeces are

(i) stored

(1)

(ii) expelled

(1)

(e) Explain how egestion differs from excretion.

(3)

(Total for Question = 10 marks)

2 The human kidney removes urea from the blood.

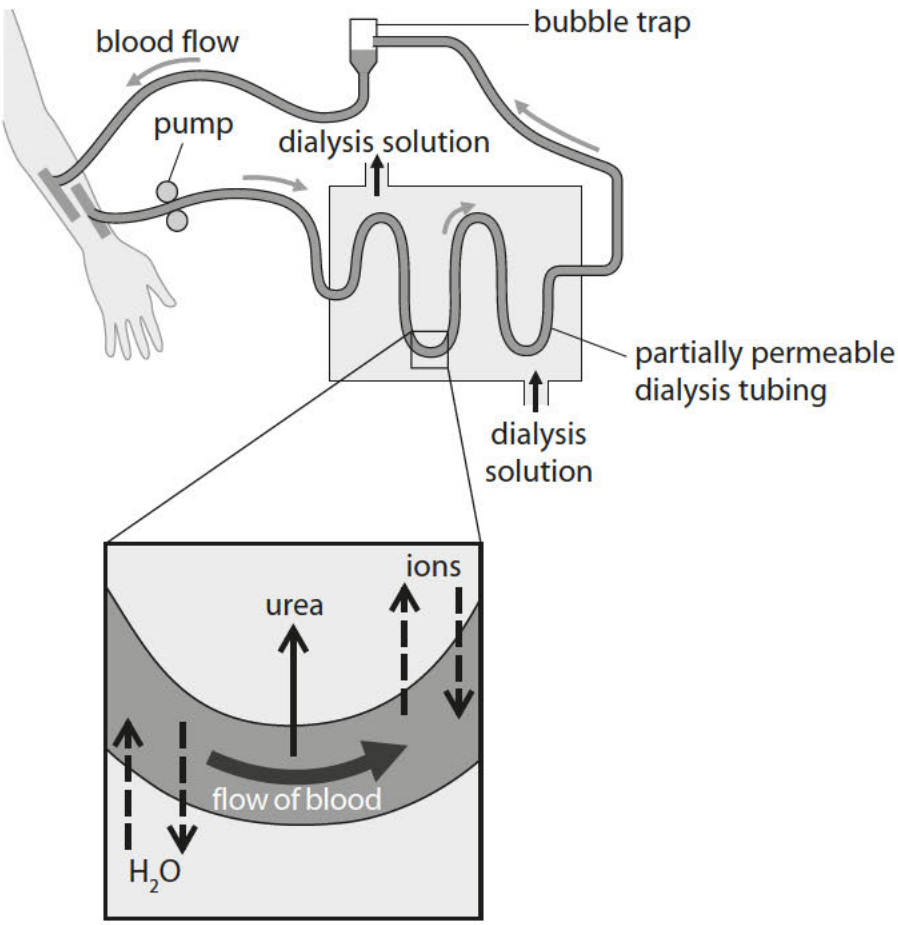
(a) Name **two** other substances the kidney removes from the blood.

(2)

1 .....

2 .....

(b) The diagram shows a simple kidney machine that uses dialysis to remove urea from the blood.



Dialysis allows small molecules to be removed from the blood. This is done by passing the dialysis solution over the tube containing the blood. The small molecules move from a region of high concentration to a region of low concentration.

(i) Give one way in which dialysis is similar to diffusion.

(1)

(ii) Give one way in which dialysis is similar to osmosis.

(1)

(iii) Describe how the kidney machine removes urea from the blood.

(2)

(iv) Another function of the kidney machine is to maintain normal blood glucose concentration.

Suggest how the concentration of glucose in the dialysis solution helps to maintain a normal glucose concentration in the blood.

(2)

(v) Describe **two** processes that take place in the kidney but not in the kidney machine.

(4)

1 .....

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.....

.....

2 .....

.....

.....

.....

(c) Kidney failure can be treated by transplanting a healthy donor kidney into the patient.

(i) The procedure involves connecting two blood vessels and a tube to the transplanted kidney.

Name the two blood vessels and the tube.

(2)

blood vessel .....

blood vessel .....

tube .....

(ii) Suggest why the transplanted kidney is placed in the lower abdomen instead of in the kidney's usual location.

(2)

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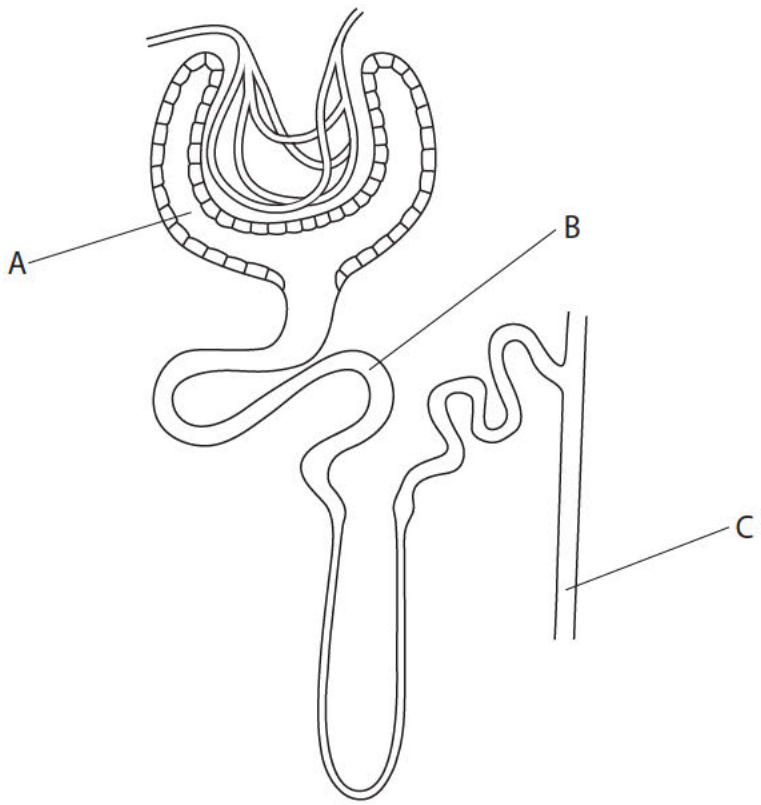
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(Total for Question = 16 marks)

3 (a) The diagram shows a kidney nephron with parts labelled A, B and C.



The table lists events that take place in the nephron.

Complete the table by giving the letter of the part where each event takes place.

(2)

Event	Letter
ultrafiltration	
glucose reabsorption	

(b) The photograph shows a flower called a dandelion.



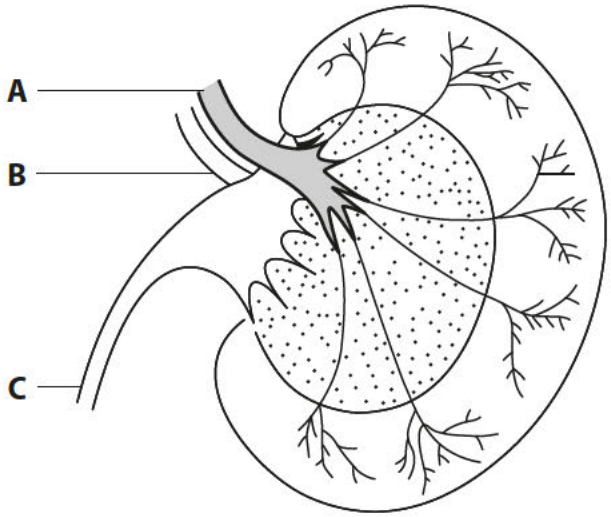
If a person picks this flower and then licks their fingers, they will want to urinate. This is because the plant produces a chemical called a diuretic that affects the regulation of the water content of the blood.

Suggest how this diuretic causes more urine to be produced.

(5)

(Total for Question = 7 marks)

4 The diagram shows the human kidney with tubes labelled A, B and C.



(a) Which letter shows the tube that would contain urine?

(1)

.....

(b) The table shows the concentration of plasma proteins and glucose in the blood entering the kidney and in the urine.

Name of substance	Concentration of substance in mg per 100 ml	
	blood entering the kidney	urine
plasma proteins	740	0
glucose	90	0

(i) Explain why there are no plasma proteins in the urine.

(2)

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.....

(ii) Explain why there is no glucose in the urine.

(2)

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(iii) Water is found in the urine.

Name two other substances you would also find in the urine.

(2)

1 .....

2 .....

(c) Some people do have glucose in their urine. These people have diabetes.

Suggest why a person with diabetes has glucose in their urine.

(2)

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(d) On a hot day there is less water in urine.

Explain how the kidney is able to reduce the water content of urine produced on a hot day.

(3)

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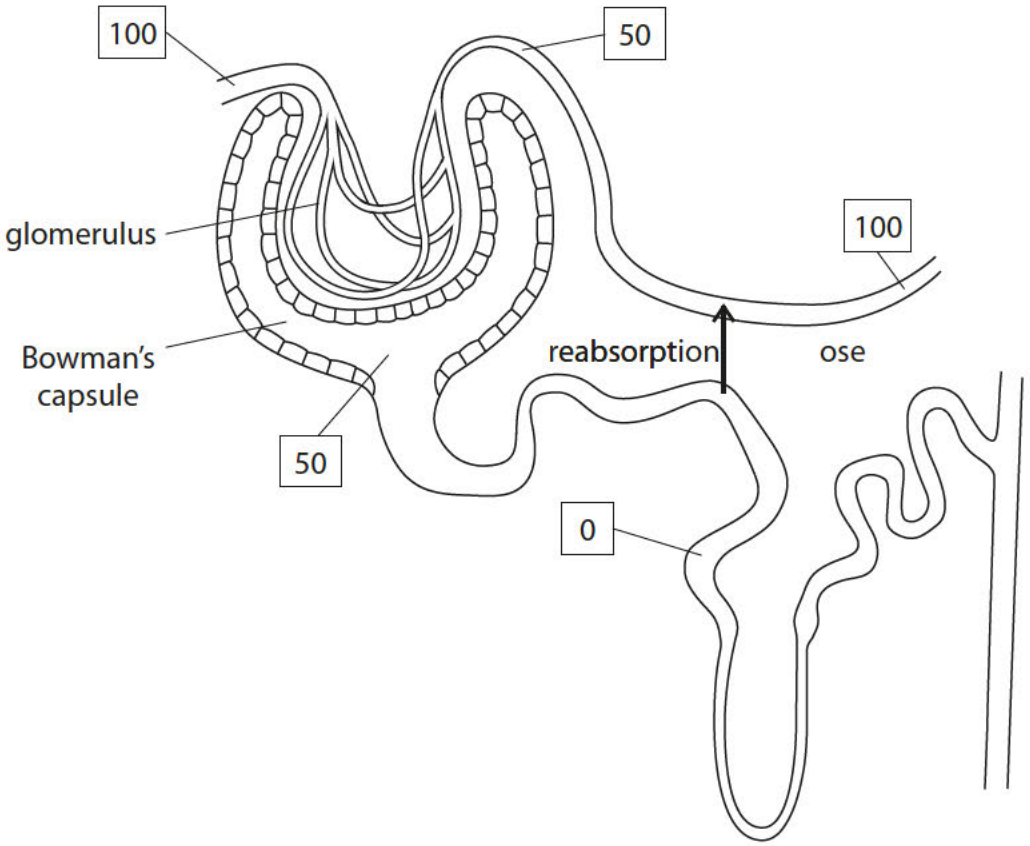
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(Total for Question = 12 marks)

5 The diagram shows some of the blood vessels and a nephron in the human kidney. The numbers represent the concentration of glucose at various places in the blood vessels and in the nephron, in arbitrary units.



(a) Explain how the structure of the blood vessels entering and leaving the glomerulus help to move glucose into the Bowman's capsule.

(2)

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(b) What type of blood vessels are found in the glomerulus?

(1)

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(c) (i) Describe how glucose is reabsorbed from the nephron back into the blood.

(2)

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(ii) Suggest why glucose needs to be returned to the blood.

(2)

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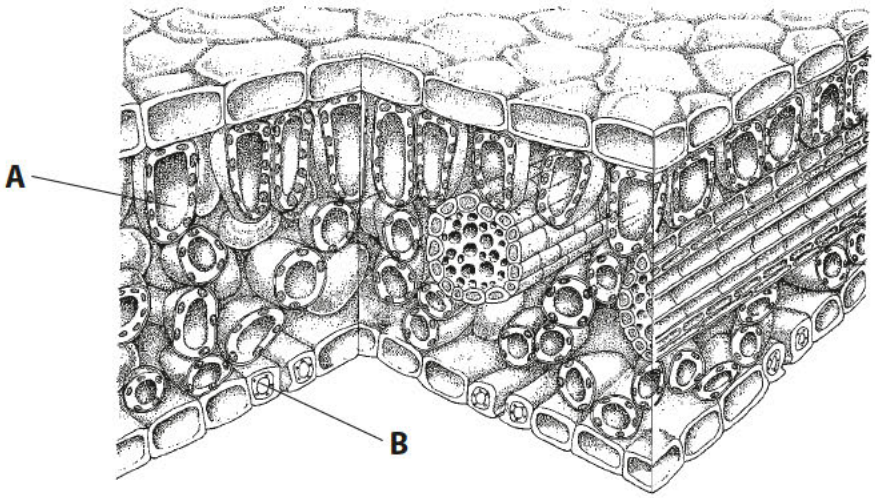
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(Total for Question = 7 marks)

6 (a) The diagram shows a section through a leaf.



(i) Name the structures labelled **A** and **B**.

(2)

A .....

B .....

(ii) Give the function of the waxy cuticle.

(1)

.....

.....

(iii) Some of the leaf cells carry out photosynthesis. Write a word equation for this process.

(2)

.....

(iv) Plants, like all living organisms, need to excrete waste products.
Explain how the excretory product of photosynthesis is removed from the leaf.

(2)

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(b) Some plants lose their leaves in cooler months. This can be described as an excretory mechanism. Suggest **two** other reasons why some plants lose their leaves in cooler months.

(2)

1 .....

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2 .....

.....

(c) Name **one** excretory organ in humans and name the substance it excretes.

(2)

organ .....

substance .....

(Total for Question = 11 marks)