1 The lungs and the kidneys are excretory organs of the human body.

(a) **(i)** Define the term *excretion*.

.....

.....

.....

.....

.....

.....

.....[3]

(ii) State an excretory product that is passed out through the lungs.

.....[1]

(iii) Outline the role of the liver in excretion.

.....

.....

.....

.....

.....

.....

.....[3]

(b) Fig. 4.1 is a vertical section of the kidney.

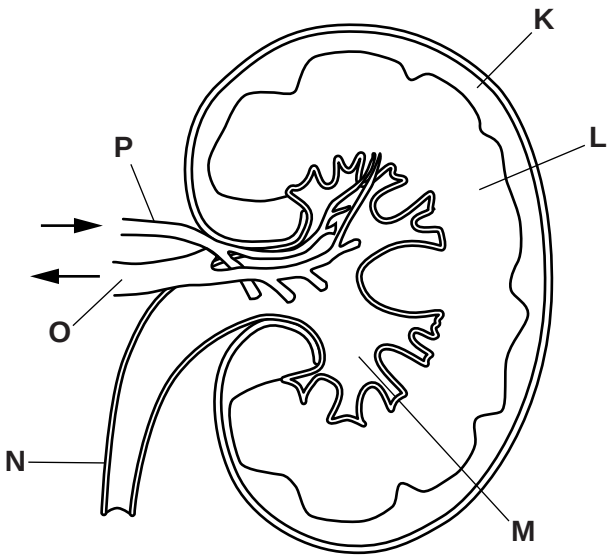

Fig. 4.1

Table 4.1 shows the functions of parts of the kidney.

Complete the table by:

- naming the part of the kidney that carries out each function
- using letters from Fig. 4.1 to identify the part of the kidney named.

One row has been completed for you.

Table 4.1

function	name of part	letter from Fig. 4.1
blood is filtered		
concentration of urine is determined	medulla	**L**
urine flows to the bladder		
blood is carried into the kidney		
blood flows out of the kidney		

[4]

(c) People with kidney disease are often treated in renal dialysis clinics. Their blood passes through tubes lined with a special membrane for about three hours.

(i) State **two** waste substances that are removed from the blood by dialysis.

1 .....

2 .....

[2]

(ii) Kidney patients may be given a kidney transplant. State **one** advantage and **one** disadvantage of kidney transplants compared with dialysis.

advantage .....

.....

.....

disadvantage .....

.....

.....

[2]

[Total: 15]

2 Fig. 5.1 shows a cross-section of a kidney.

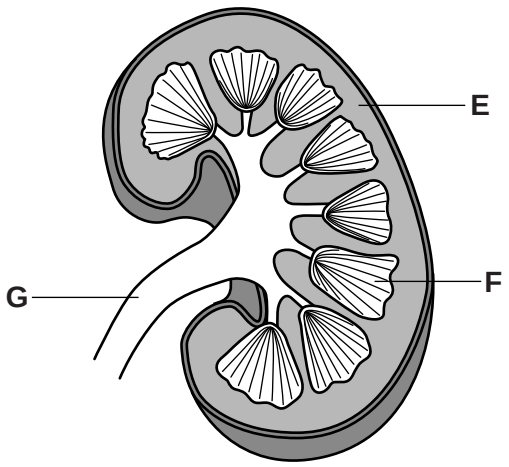

Fig. 5.1

(a) Name the structures labelled, **E**, **F** and **G** as shown in Fig. 5.1.

E .....

F .....

G .....

[3]

(b) Explain the function of the renal capsule in the kidney.

.....

.....

.....

.....

.....

.....

.....[3]

(c) Glucose is reabsorbed, back into the blood, by active transport.

Define *active transport.*

.....

.....

.....

.....

.....[2]

(d) Give **one** example, other than glucose, of a substance that is reabsorbed into the blood from the renal tubule.

.....[1]

(e) Dialysis is a treatment for kidney disease.

Fig. 5.2 shows a dialysis machine.

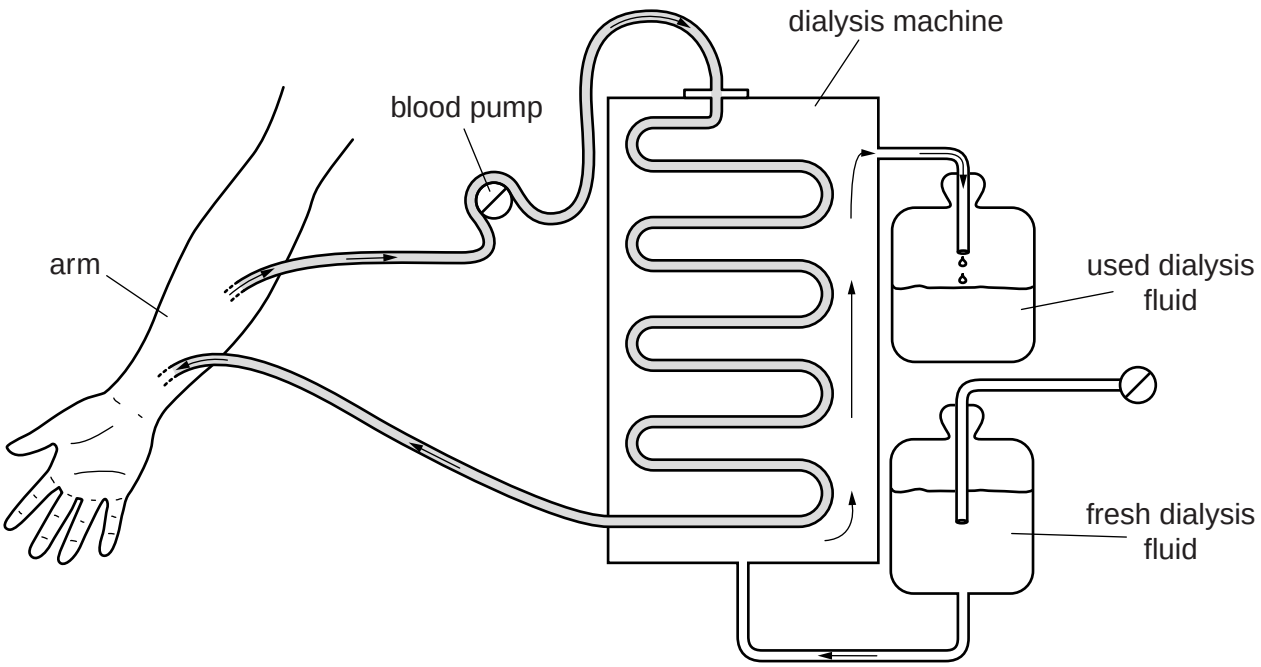

Fig. 5.2

(i) The composition of the dialysis fluid changes as it passes through the dialysis machine.

Complete Table 5.1 using the words 'low', 'high', 'same' or 'none' to show how the concentration of each substance changes in the dialysis fluid.

The last one has been done for you.

Table 5.1

	concentration of substance in:		
substance	blood before dialysis	**used** dialysis fluid	**fresh** dialysis fluid
glucose	normal		
salts	high		
urea	high		
toxins	high	high	low

[3]

(ii) Explain how a dialysis machine filters blood.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

(f) Kidney transplants are the most common organ transplants.

Describe the **advantages** of a kidney transplant compared with dialysis.

.....

.....

.....

.....

.....

.....

.....[3]

(g) Before a kidney is transplanted, it is important to match the tissue type of the donor with the tissue type of the recipient.

State why this is necessary.

.....

.....[1]

[Total: 20]

3 **(a)** Define the term *excretion*.

.....

.....

.....

.....

.....

.....[3]

Fig. 2.1 is a diagram of a kidney tubule and its blood supply.

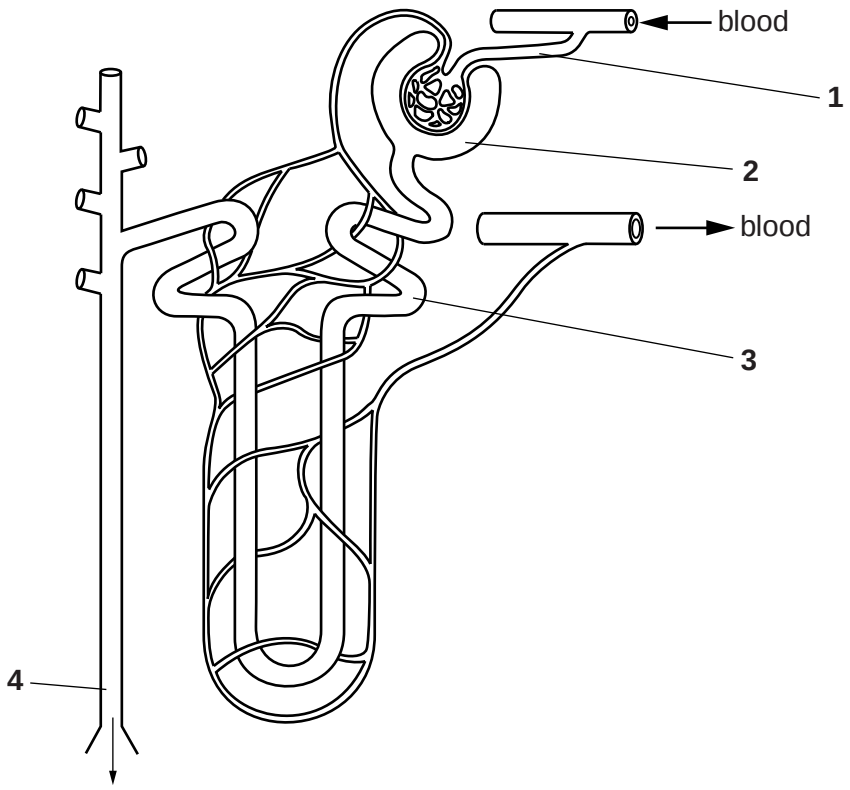

Fig. 2.1

(b) The concentrations of solutes in the fluids at regions **1**, **2**, **3** and **4** were determined. The results are shown in Table 2.1.

Table 2.1

substance	concentration / g dm^{-3}			
	region **1**	region **2**	region **3**	region **4**
glucose	0.9	0.9	0.2	0.0
protein	82.0	0.0	0.0	0.0
salts	8.0	8.0	9.6	16.5
urea	0.2	0.2	0.2	20.0

State the substance or substances in Table 2.1 which:

(i) has molecules which are too large to be filtered;

.....[1]

(ii) has molecules which are small enough to be filtered but is completely reabsorbed from the fluid in the kidney tubule;

.....[1]

(iii) increases in concentration as fluid moves along the kidney tubule.

1 .....

2 .....[1]

(c) State **three** structures through which the fluid from region **4** passes as it leaves the body.

1 .....

2 .....

3 .....[3]

(d) One role of the kidney is to maintain the concentration of the blood plasma.

Name the process of maintaining constant conditions within the body.

.....[1]

[Total: 10]