

**REVISION (4)**

**GRADE 8**

**CHAPTER**

**EXCRETION**

**(PAPER 3)**

1 The kidneys remove metabolic waste from the liquid part of the blood.

Name:

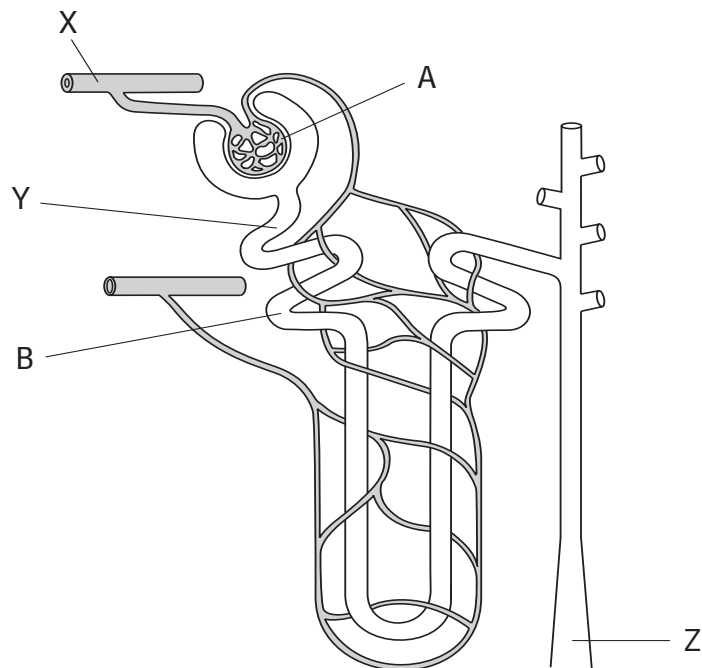
(i) the liquid part of the blood;

**A) Plasma (1)**

(ii) the process that involves removing metabolic waste from the body.

**A) Excretion (1)**

Fig. 1.1 shows a kidney tubule and its associated blood vessels.



**Fig. 1.1**

(b) Describe the functions of the regions labelled **A** and **B**.

**A) Ultra filtration (small molecules from blood or glomerulus are pushed out under high pressure into bowman's or renal capsule).**

**B) Selective reabsorption (substance filtered or reabsorbed back into the blood / capillaries) (4)**

Table 1.1 shows the concentrations of some substances in the blood at **X**, the fluid at **Y** and the urine at **Z**.

**Table 1.1**

substance	concentration / g per 100cm <sup>3</sup>		
	blood at X	fluid at Y	urine at Z
glucose	0.1	0.1	0.0
protein	7	0	0
sodium ions	0.35	0.35	0.5
urea	0.03	0.03	2.0

(c) Name the substance shown in Table 1.1 that:

(i) has molecules that are too large to pass through the walls of capillaries;

**A) Protein**

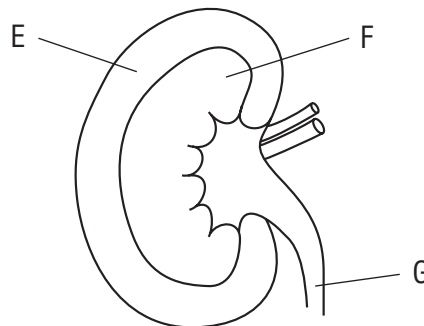
(ii) is all reabsorbed in the kidney;

**A) Glucose**

(iii) is a metabolic waste product.

**A) Urea**

2 Fig. 3.1 shows a vertical section of a kidney.



**Fig. 3.1**

(a) Name the parts **E**, **F** and **G**.

**E) Cortex**

**F) Medulla**

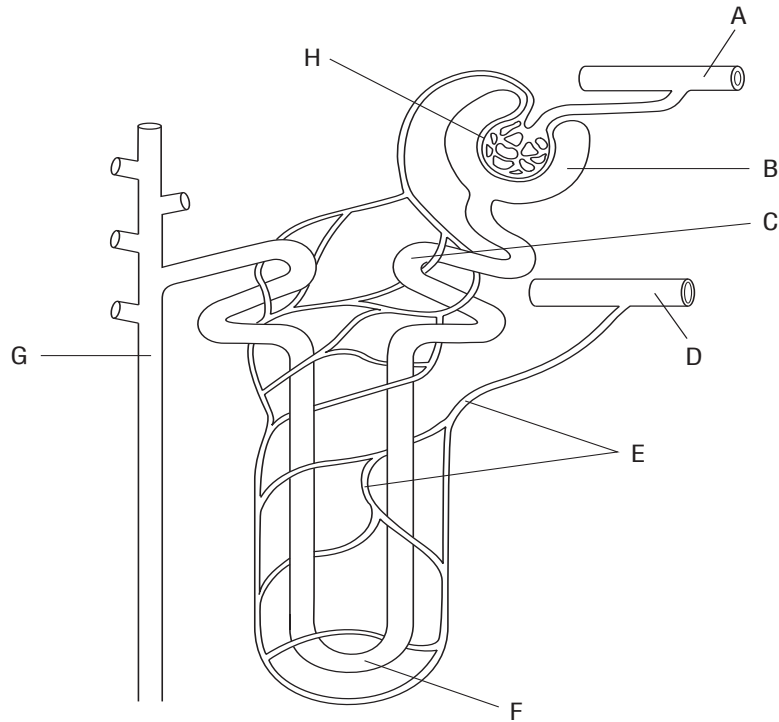
**G) Ureter**

**(3)**

3 (a) Define the term *excretion*.

**A) Excretion is a process by which metabolic waste is eliminated from an organism.**

Fig. 2.1 shows a kidney tubule and the blood vessels associated with it.



**Fig. 2.1**

(b) Table 2.1 shows some processes that occur in a kidney.

In Table 2.1, write the **letter** of the part shown in Fig. 2.1 where each process occurs.

You must put **one** letter in each box. You may use the same letter more than once.

**Table 2.1**

process	letter
filtration of blood	
reabsorption of most of the solutes from the filtrate	
water is absorbed by osmosis to determine the concentration of urine	
unfiltered blood returns to the renal vein	

**A)**

process that occurs in the kidney tubule	letter from Fig. 2.1
filtration of blood	<b>H</b>
reabsorption of most of the solutes in the filtrate	<b>C</b>
water is absorbed by osmosis to determine the concentration of urine	<b>G</b>
unfiltered blood returns to the renal vein	<b>D / E</b>

[4]

(c) Table 2.2 lists the components of blood, filtrate and urine.

**Table 2.2**

component		filtrate	urine
red blood cells	✓	✗	✗
white blood cells	✓		
plasma proteins	✓		
glucose	✓		
urea	✓		
salts	✓		
water	✓		

Complete the table by using ticks (✓) and crosses (✗) to show whether or not each component is present in filtrate and in urine of a healthy person. The first component has been done for you. [2]

**A)**

component	blood	filtrate	urine	
red blood cells	✓	✗	✗	of fil of ur
white blood cells	✓	✗	✗	
plasma proteins	✓	✗	✗	
glucose	✓	✓	✗	
urea	✓	✓	✓	
salts	✓	✓	✓	
water	✓	✓	✓	

[2]

- 4 A healthy kidney controls the excretion of urea and other waste products of metabolism from the blood.

After kidney failure there are two possible treatments: dialysis or a kidney transplant.

Fig. 4.1 shows how blood and dialysis fluid move through a dialysis machine.

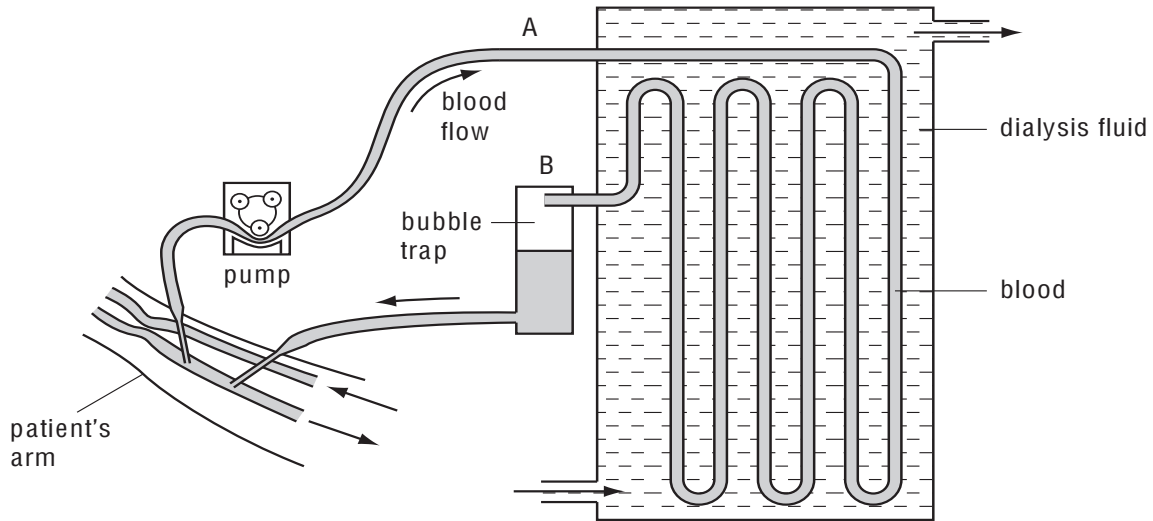


Fig. 4.1

- (a) Describe the changes that occur to the blood as it flows through the dialysis machine from A to B.

**A) The blood as it flows through the dialysis machine from A to B**  
**urea (concentration) decreases ;**  
**water (content) increases / decreases ;**  
**salt (concentration), decreases ; (2)**

- (b) Discuss the advantages of kidney transplants compared with dialysis.

A)

	Advantages
Kidney transplants	<ul style="list-style-type: none"> <li>• Patients can lead a more normal life without having to watch what they eat and drink</li> <li>• Cheaper for the NHS overall</li> </ul>
Kidney dialysis	<ul style="list-style-type: none"> <li>• Available to all kidney patients (no shortage)</li> <li>• No need for immune-suppressant drugs</li> </ul>

(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.

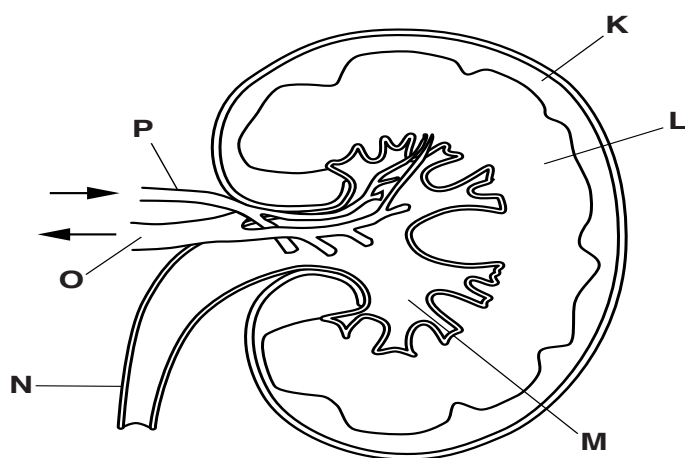
State why this is necessary.

**A) Avoid rejection**

**Stop immune system attacking new kidney (1)**

**5 (a)**

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	<b>L</b>
urine flows to the bladder		
blood is carried into the kidney		
blood flows out of the kidney		

**A)**

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Function	Name	letter from Fig.4.1
blood is filtered	cortex	<b>K ;</b>
concentration of urine is determined	medulla	<b>L</b>
urine flows to the bladder	<u>ureter</u>	<b>N ;</b>
blood is carried into the kidney	renal artery	<b>P ;</b>
blood flows out of the kidney	renal vein	<b>O ;</b>

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

**A)**

**1. Ultra filtration**

**2. High blood pressure assists filtrate to pass through**

**glomerulus capsule**

**3. Proteins and blood cells are too big to move out of capsule /  
glomerulus**

**4. Filtrate e.g water ,urea, and dissolved salts small enough to pass  
through (3)**