Low Demand Questions QUESTIONSHEET 1

Water, carbon dioxide, urea and excess salts need to be removed from the body.

(a) What is the name of the process which removes these substances from the body

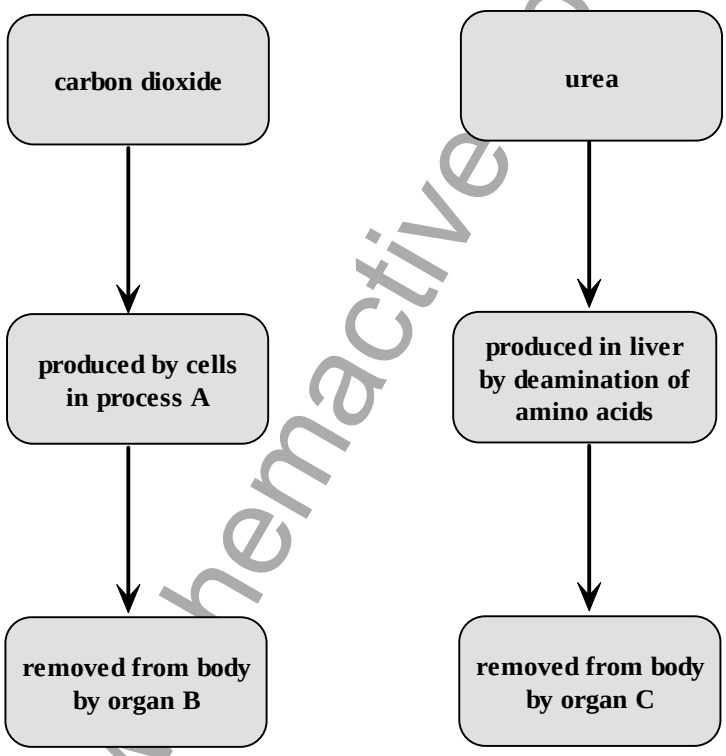
..... [1]

(b) Name two body organs which remove excess salts from the body.

.....

..... [2]

(c) The diagram shows the production and removal of carbon dioxide and urea by the body.



(i) Name the process which produces carbon dioxide in the cells.

..... [1]

(ii) Name organ B.

..... [1]

(iv) Name organ C.

..... [1]

(d) Name **two** organs which remove water from the body.

.....

..... [2]

TOTAL / 8

Low Demand Questions QUESTIONSHEET 2

The table shows the amount of water gained and lost by the body each day.

Water gained from	**Volume of water gained each day /cm^3**	**Water lost in**	**Volume of water lost each day /cm^3**
Drink	1250	Urine	1400
Food	950	Exhaled air	450
Formed in body	300	Faeces	150
		Skin	500
Total		Total	2500

(a) What is the total amount of water gained each day?

..... [1]

(b) How much water is lost by the urine and faeces together?

..... [1]

(c) Work out the percentage of the total water loss which is lost by the skin.
Show your working.

.....

..... [2]

(d) How much more water is gained from drink than from food?

..... [1]

(e) Suggest two ways in which the amounts of water gained and lost each day would be different in a very hot climate.

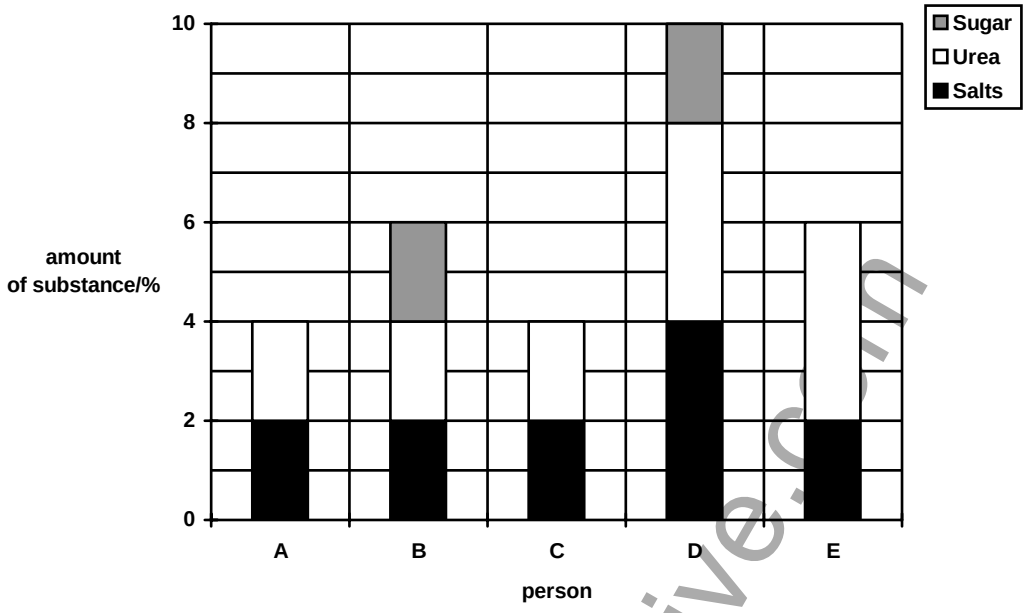
.....

..... [2]

TOTAL / 7

Low Demand Questions QUESTIONSHEET 3

The bar chart shows the percentage amounts of different substances in the urine of 5 people.



(a) Which substance, not on the chart, makes up most of the urine of the 5 people?

..... [1]

(b) Which two people have sugar in their urine?

.....

..... [2]

(c) Which person has most salts in the urine?

..... [1]

(d) What is the percentage amount of urea in the urine of

(i) person A?

..... [1]

(ii) person D?

..... [1]

(e) The urine of a normal, healthy person contains 2% urea and 2% salts and no sugar.
Which two of the 5 people are normal and healthy?

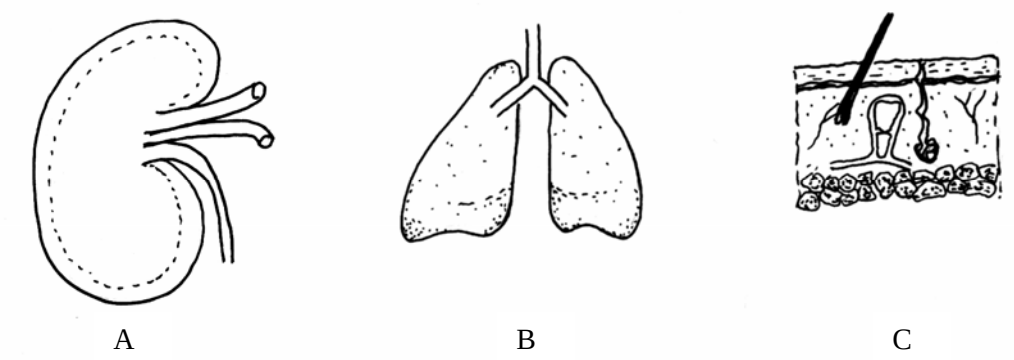
.....

..... [2]

TOTAL / 8

Low Demand Questions QUESTIONSHEET 4

The diagram shows three organs involved in removing waste products from the body.



A B C

(a) Name the organs A, B and C.

A. ..... [1]

B. ..... [1]

C. ..... [1]

(b) Some of the following statements are true and some are false.
Tick (3) the box if the statement is true. [4]

1 Organs A, B and C remove water from the body ☐

2 Organ A helps to control body temperature. ☐

3. Organs B and C remove carbon dioxide from the body. ☐

4. Urine is produced by organ A. ☐

5. Water and salts are removed from the body by organ C. ☐

6. Organ A produces urea. ☐

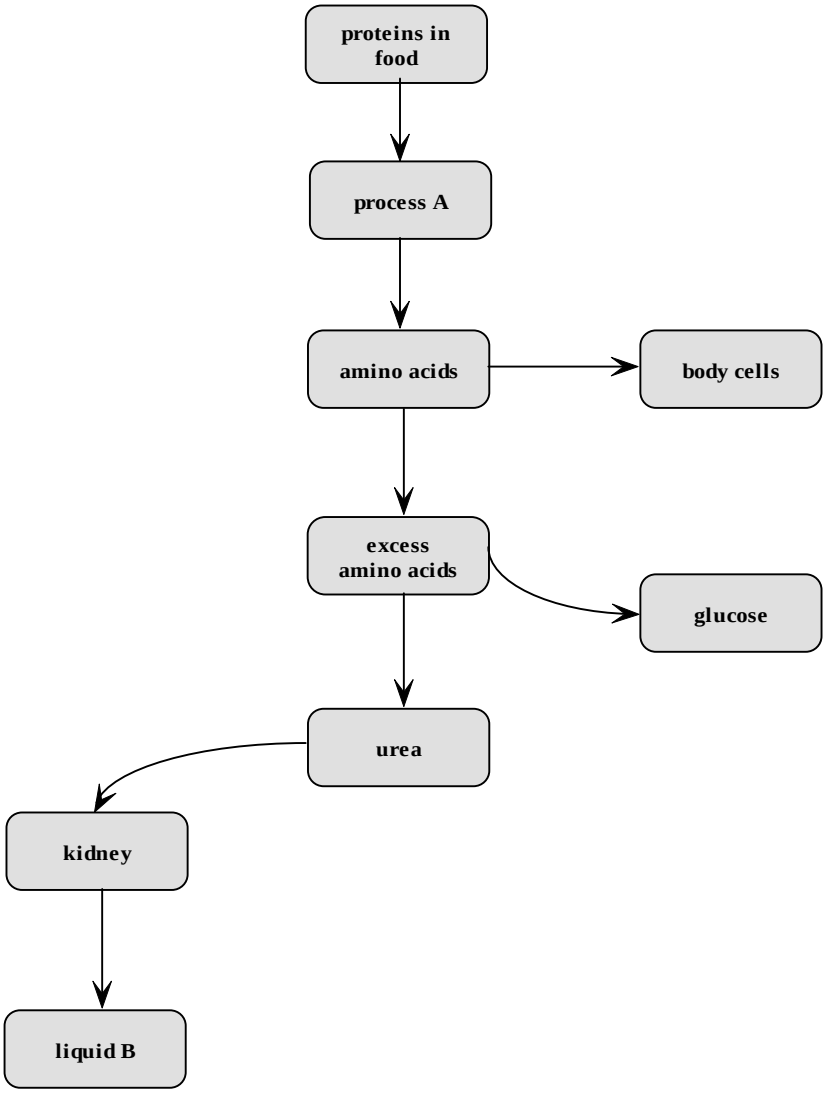
7. Organ A removes urea and salts from the body. ☐

TOTAL / 7

Medium Demand Questions QUESTIONSHEET 5

Intermediate

(a) The diagram shows how the body uses amino acids.



(i) What is process A?

..... [1]

(ii) What do body cells use amino acids for?

..... [1]

(iii) In which organ are excess amino acids converted into urea?

..... [1]

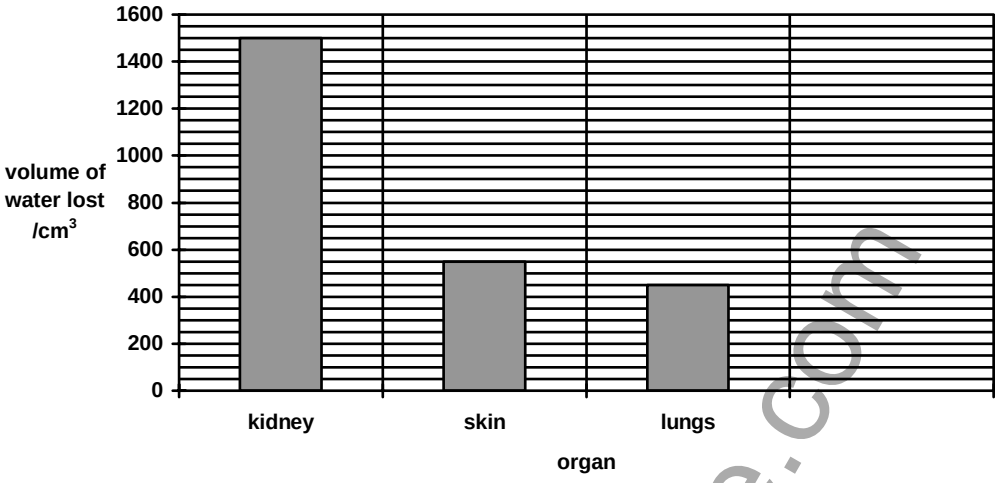
(iv) How is urea transported to the kidney?

..... [1]

TOTAL / 4

Medium Demand Questions QUESTIONSHEET 6

The bar chart shows the daily amount of water lost by various organs.



(a) What is the total volume of water lost per day?

..... [1]

(b) What fraction of the total water loss is lost through the skin and lungs together.
Show your working.

.....

..... [2]

(c) Explain why a person who takes vigorous exercise each day would lose more water.

.....

..... [2]

(d) During summer, the volume of water lost by the skin increases and the volume of water lost by the kidney decreases. Explain why.

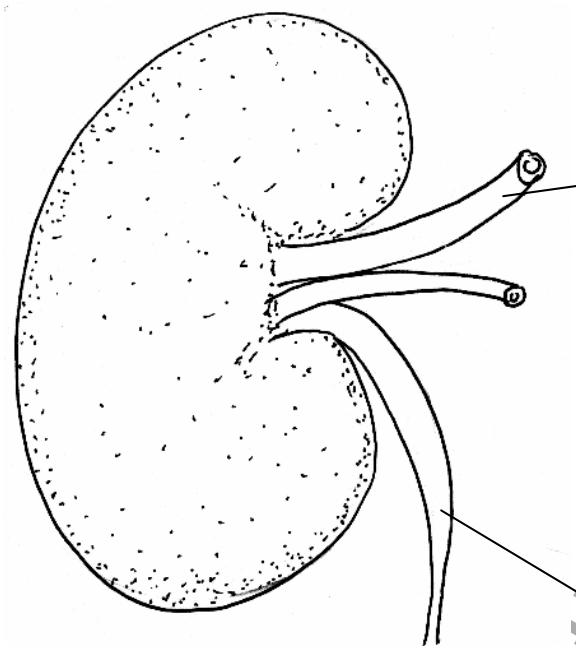
.....

..... [2]

TOTAL / 7

Medium Demand Questions QUESTIONSHEET 7

The diagram shows some of the substances in the blood entering the kidney and in the fluid in the ureter.



blood in renal artery	
substance	**amount /grams per litre**
sugar	1.2
urea	0.35
salt	8.7
protein	75.0

fluid in ureter	
substance	**amount /grams per litre**
sugar	0.0
urea	19.0
salt	12.5
protein	0.0

(a) Name the fluid which passes down the ureter.

..... [1]

(b) Use the information in the tables to describe three differences between the blood in the renal artery and the fluid in the ureter.

.....

.....

..... [3]

(c) Name two substances, from the table, that the kidneys remove from the body.

.....

..... [2]

(d) Which other substance makes up most of the fluid in the ureter?

..... [1]

TOTAL / 7

Medium Demand Questions QUESTIONSHEET 8

Some of the following statements are true and some are false. Tick (√) the box if the statement is true. [6]

1. Urine is produced by the bladder. ☐

2. During exercise the body temperature increases. ☐

3. Carbon dioxide is a waste product of respiration. ☐

4. Sweat produced by the skin helps to cool the body. ☐

5. The kidney breaks down amino acids and produces urea. ☐

6. The presence of sugar in the urine is a sign of diabetes. ☐

7. In hot weather the concentration of urine increases. ☐

8. The amount of carbon dioxide excreted by the lungs remains constant at all times. ☐

9. Homeostasis involves keeping the internal environment constant. ☐

10. In cold weather more water is lost by the skin and less by the kidneys than in warm weather. ☐

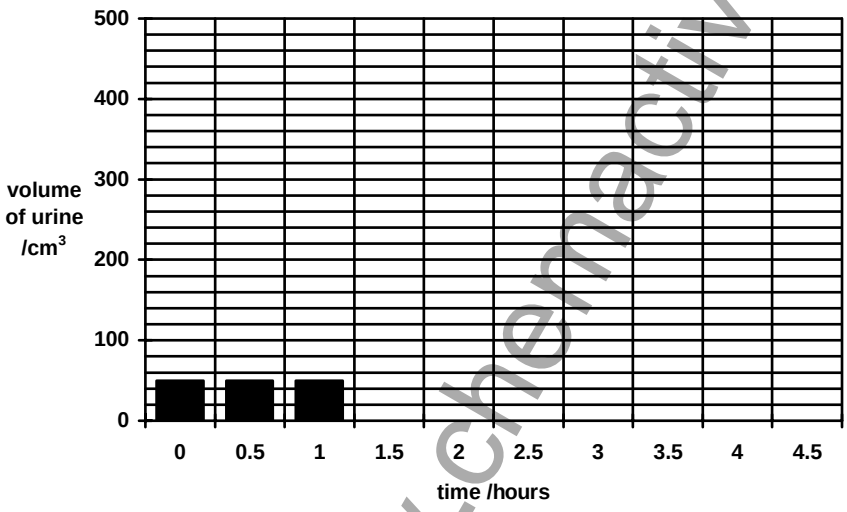
TOTAL / 6

Medium Demand Questions QUESTIONSHEET 9

The volume of urine produced by a person was measured every half hour for several hours.
The person drank a litre of water 1 hour after the measurements started.
The results are shown in the table.

Time /hours	**Volume of urine collected each 1/2 hour /cm^3**
0	50
0.5	50
1(water drunk)	50
1.5	280
2	450
2.5	250
3	120
3.5	80
4	50
4.5	50

(a) Some of these figures have been plotted on the grid. Plot the remaining figures. [3]



(b) What was the normal amount of urine produced each half hour by the subject?

..... [1]

(c) Describe the effect of drinking the water on the volume of urine produced.

.....

..... [2]

(d) Calculate the total volume of urine produced between 1 hour and 3 hours.

..... [1]

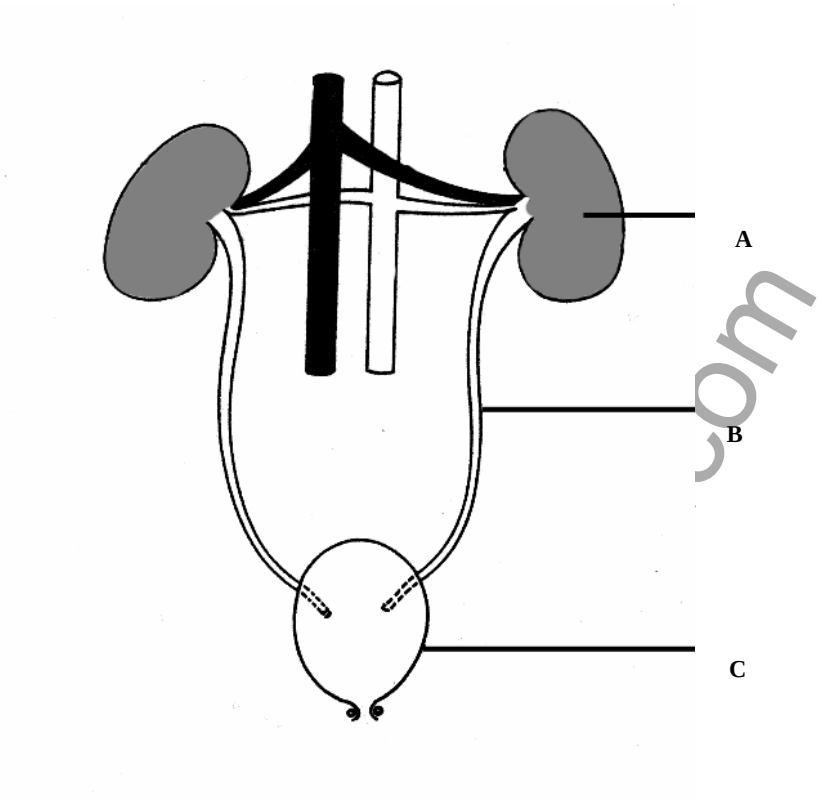
(e) How long after drinking the water did it take for the urine production to return to normal?

..... [1]

TOTAL / 8

Medium Demand Questions QUESTIONSHEET 10

The diagram shows the urinary system.



(a) Name the parts labelled A, B and C.

A. ..... [1]

B. ..... [1]

C. ..... [1]

(b) Name three substances excreted by the kidneys.

.....

.....

..... [3]

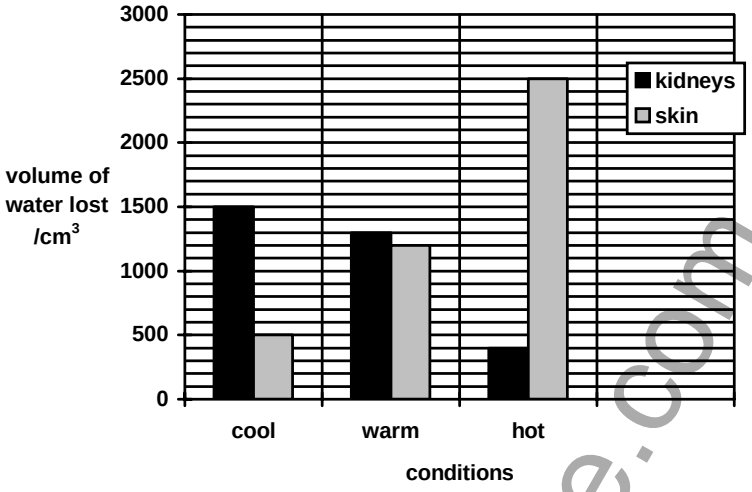
(c) What is the function of the part labelled C?

..... [1]

TOTAL / 7

Medium Demand Questions QUESTIONSHEET 11

The chart shows the volume of water lost by the skin and the kidneys in cool conditions, warm conditions and hot conditions.



(a) What was the total amount of water lost by the kidneys and the skin

(i) under cool conditions?

..... [1]

(ii) under hot conditions?

..... [1]

(b) What is the relationship between the temperature of the conditions and the volume of water lost by the skin?

..... [1]

(c) Why does the volume of water lost by the kidneys decrease as the conditions become hotter?

.....

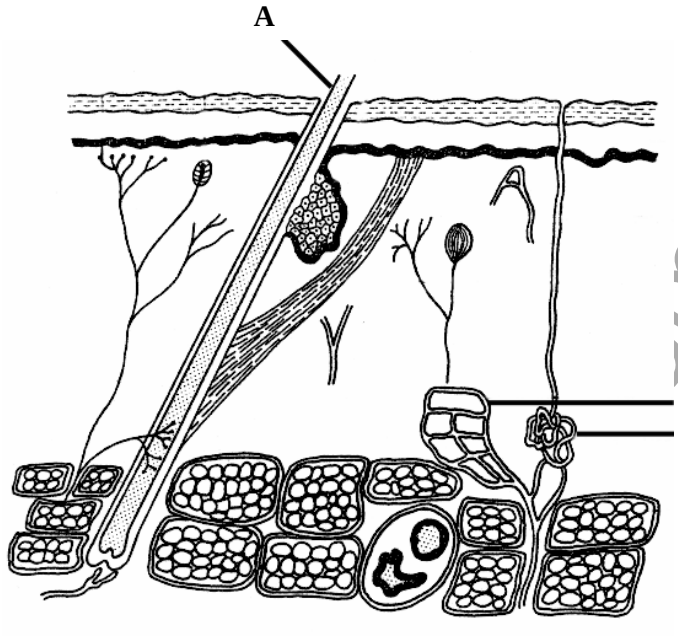
.....

..... [3]

TOTAL / 6

Medium Demand Questions QUESTIONSHEET 12

The diagram shows a section through the skin.



(a) Name the parts labelled A, B and C.

A. ..... [1]

B. ..... [1]

C. ..... [1]

(b) Which of the parts labelled A, B or C,

(i) produces sweat?

..... [1]

(ii) carries blood to the skin surface?

..... [1]

(c) People who do physical work in a hot climate often

(i) take salt tablets.

(ii) drink more than normal.

Suggest a reason for each of these.

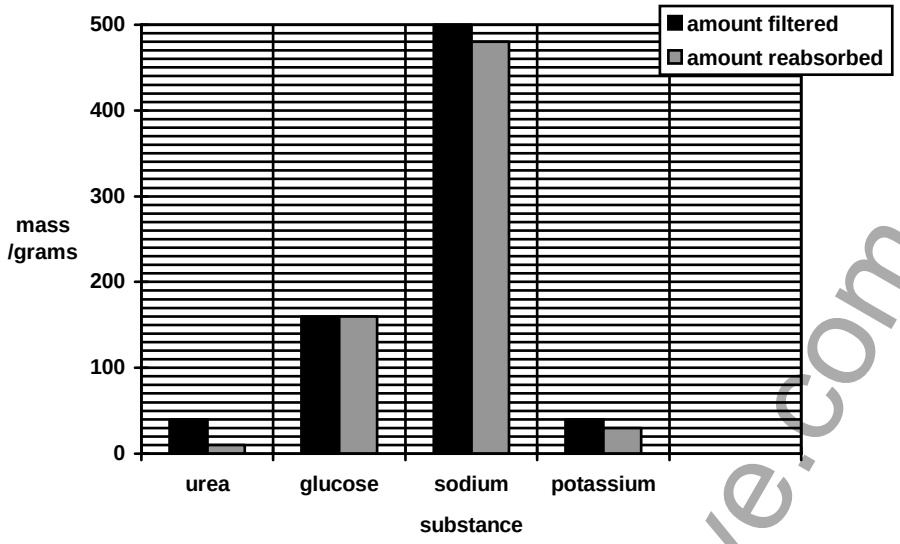
.....

..... [2]

TOTAL / 7

High Demand Questions QUESTIONSHEET 13

The bar chart shows the amounts of various substances filtered and reabsorbed by the kidneys each day



(a) Which substance is completely reabsorbed?

..... [1]

(b) Calculate the percentage of sodium that is reabsorbed.
Show your working.

.....

..... [2]

(c) How much

(i) urea is excreted by the kidneys?

..... [1]

(ii) potassium is excreted by the kidneys?

..... [1]

(d)(i) The volume of water filtered by the kidneys is approximately 160 litres per day.
Of this 1.6 litres is excreted.
What volume of water is reabsorbed?

..... [1]

(Continued...)

QUESTIONSHEET 13 CONTINUED

(ii) Name the hormone which controls the amount of water reabsorbed by the kidneys.

..... [1]

(e) Which of the substances in the chart would be excreted in larger amounts

(i) by a diabetic?

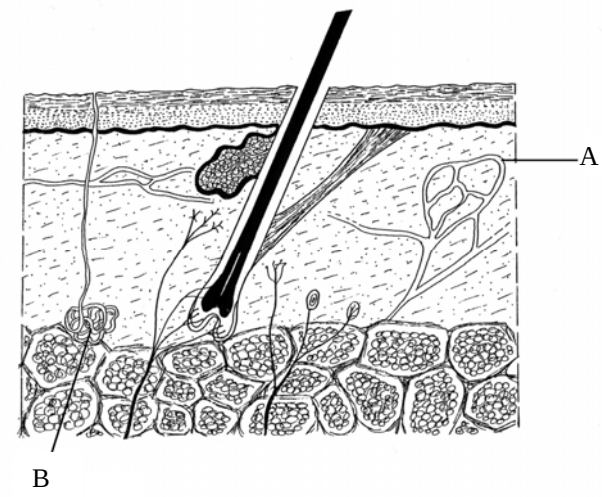
..... [1]

(ii) by a body builder using a high-protein diet?

..... [1]

High Demand Questions QUESTIONSHEET 14

The diagram shows a section of human skin.



(a) Name the parts labelled A and B.

A. ..... [1]

B. ..... [1]

(b) How does the substance produced by structure B help a person to lose heat?

.....

..... [2]

(c) After vigorous exercise the skin may look flushed and feel hot.

(i) Explain why the skin may look flushed and feel hot.

.....

.....

.....

..... [3]

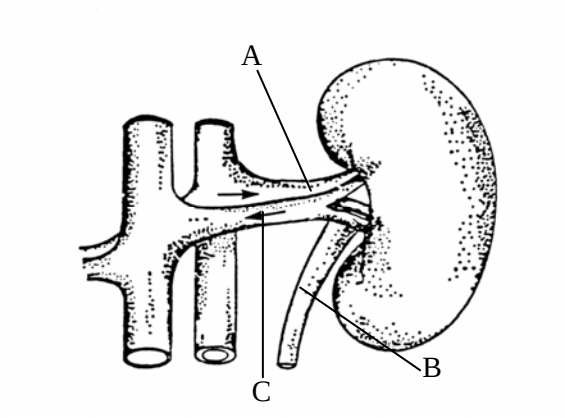
(ii) How does this help a person to lose heat?

..... [1]

TOTAL / 8

High Demand Questions QUESTIONSHEET 15

The diagram shows part of the urinary system and its blood supply.



(a) Name the parts labelled A, B and C.

A. ..... [1]

B. ..... [1]

C. ..... [1]

(b) As the blood passes through the kidney its composition is changed.
The list shows some of the substances present in blood entering the kidney.
For each substance state whether the blood leaving the kidney contains **more/less** or the **same amount of the substance.**

(i) glucose

..... [1]

(ii) salt (ions)

..... [1]

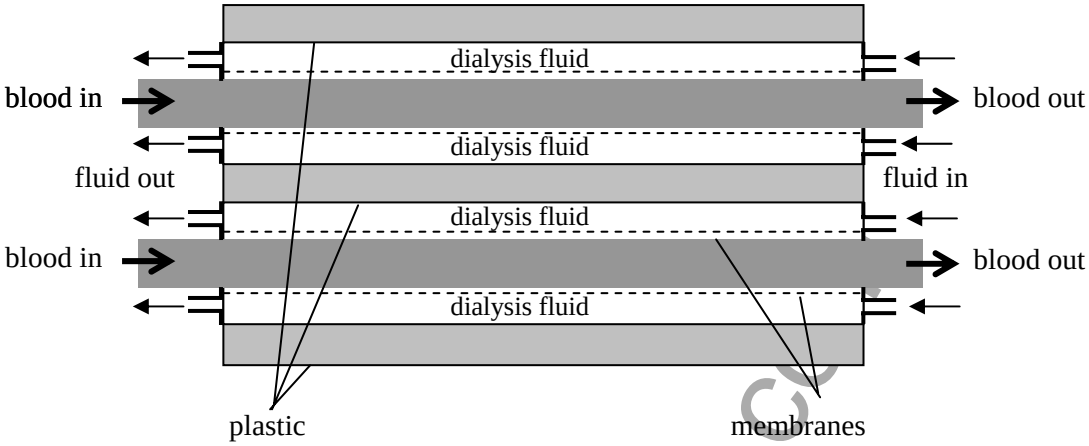
(iii) water

..... [1]

(Continued...)

QUESTIONSHEET 15 CONTINUED

(c) People who suffer from kidney failure may be treated by dialysis. The diagram shows a dialysis machine.



Describe how the composition of the blood changes as it passes through a dialysis machine.

.....

.....

.....

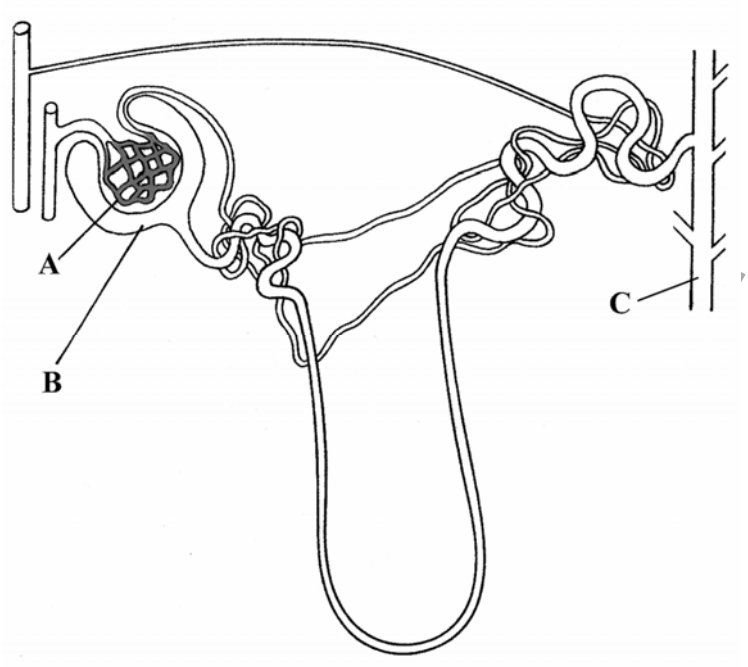
.....

..... [3]

TOTAL / 9

High Demand Questions QUESTIONSHEET 16

The diagram shows a kidney nephron.



(a) Name the structures labelled A, B and C.

A. ..... [1]

B. ..... [1]

C. ..... [1]

(b) In structure A substances from the blood plasma are forced out of the blood and into structure B.

(i) What is this process called?

..... [1]

(ii) One of the substances forced out of the blood plasma is glucose.
Name **two** other substances which are forced out and excreted.

.....

..... [2]

(iii) Explain why glucose does not normally appear in the urine.

..... [1]

(Continued...)

QUESTIONSHEET 16 CONTINUED

(c) The table gives some information about the urinary system of two animals.

Animal	Length of loop of Henle	Type of urine produced
Beaver (water-living)	short	dilute
Desert rat (desert-living)	long	concentrated

(i) What is the relationship between the length of the loop of Henle and the type of urine produced?

..... [1]

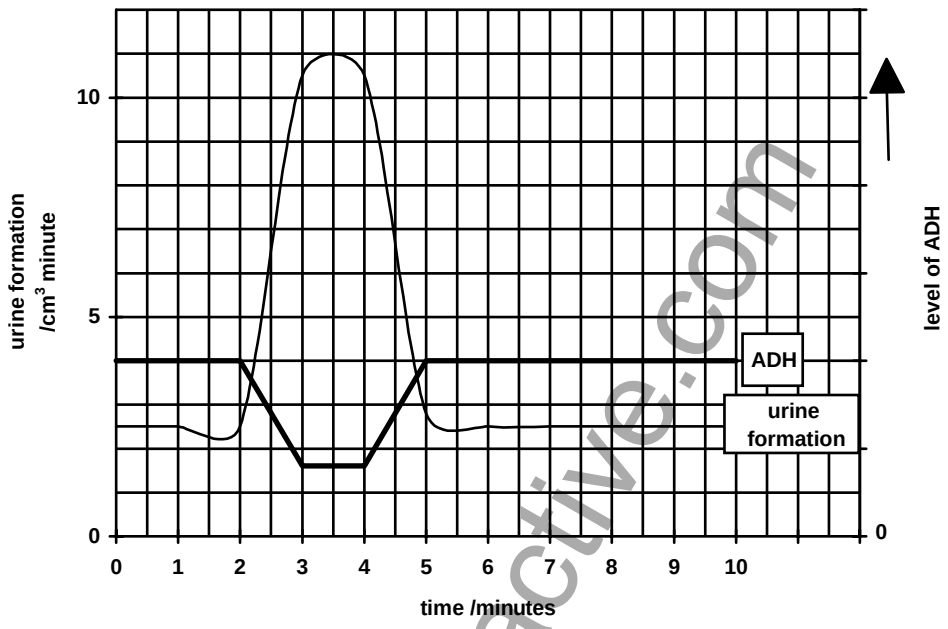
(ii) From the information, suggest the function of the loop of Henle.

..... [1]

TOTAL / 9

High Demand Questions QUESTIONSHEET 17

The graph shows the level of anti-diuretic hormone (ADH) in the blood and the rate at which urine is formed



(a)(i) What is the normal rate of urine production?

..... [1]

(ii) What is the highest rate of urine production?

..... [1]

(b)(i) What effect does a fall in the level of ADH have on the rate of urine production?

..... [1]

(ii) What effect does a rise in the level of ADH have on the rate of urine production?

..... [1]

(c) Describe how ADH controls the level of water in the blood.

.....

.....

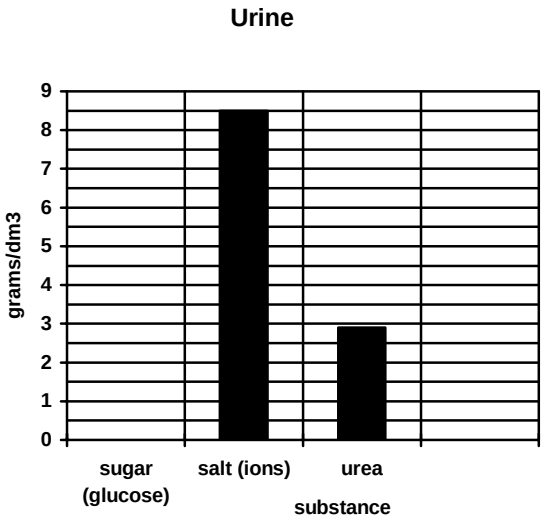
.....

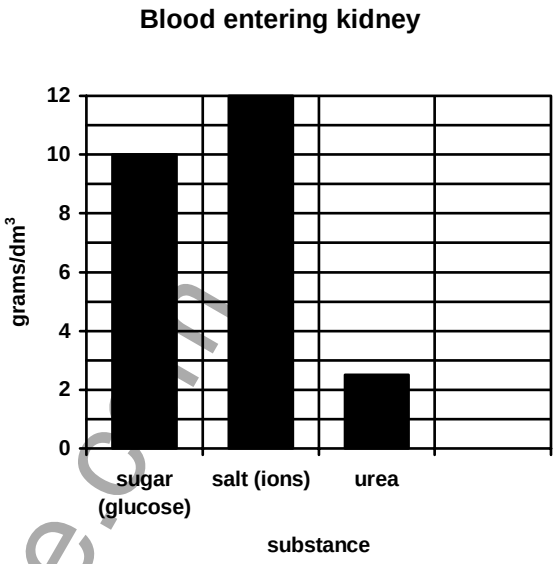
..... [4]

TOTAL / 8

High Demand Questions QUESTIONSHEET 18

(a) The bar chart shows the amount of three substances in blood entering the kidney and in urine.





(i) Calculate the amount of salt that would be present in the blood leaving the kidney.
Show your working.

.....

..... [2]

(ii) Explain why the urine does not normally contain any sugar (glucose)

.....

..... [2]

(b) Samples of urine from three different people A, B and C were tested for the presence of alcohol, glucose and protein.
The table shows the results of these tests.

√ = present
x = absent

Person	Alcohol	Glucose	Protein
A	√	x	√
B	x	√	x
C	√	x	x

Which of the people A, B or C is likely to be suffering from

(i) diabetes? Give a reason for your answer.

.....

..... [2]

(ii) a kidney disease? Give a reason for your answer.

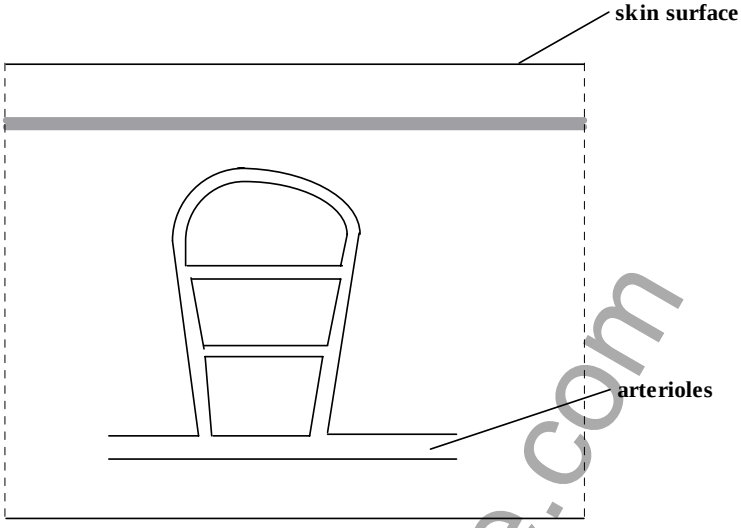
.....

..... [2]

TOTAL / 8

High Demand Questions QUESTIONSHEET 19

The diagram shows the blood vessels in the skin.



(a)(i) What will happen to the arterioles when the body temperature falls?

..... [1]

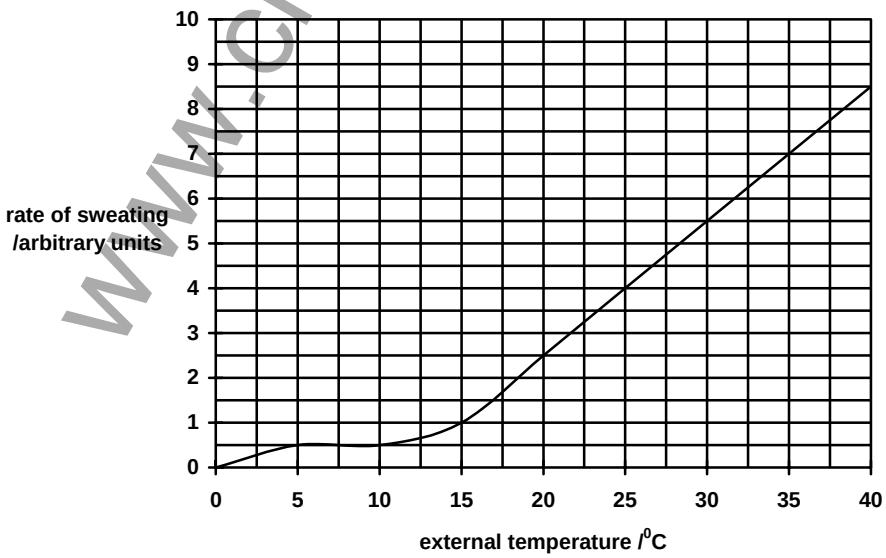
(ii) What is the effect of this change?

.....

.....

..... [3]

(b) The graph shows the rate of sweat production over a range of external temperatures



(Continued...)

QUESTIONSHEET 19 CONTINUED

(i) What was the rate of sweating when the external temperature was 20^{o}C?

..... [1]

(ii) How did the rate of sweating change when the external temperature increased from 15^{o}C to 30^{o}C?

.....

..... [2]

(iii) What happens to the skin temperature as the rate of sweating increases?

..... [1]

(iv) How does sweating help to maintain body temperature?

.....

..... [2]

TOTAL / 10

High Demand Questions QUESTIONSHEET 20

Explain each of the following,

(a) In very cold conditions we may shiver.

.....

.....

..... [3]

(b) Drinking cold water causes the rate of sweating to decrease.

.....

.....

..... [3]

(c) Vigorous exercise causes the urine to become more concentrated.

.....

..... [2]

(d) Drinking alcohol (which reduces ADH production) causes the urine to become more dilute.

.....

.....

..... [3]

TOTAL / 11