

1 Diffusion and active transport take place in healthy kidneys

1 (a) (i) What is the meaning of 'active transport'?

Movement of molecules/ions/particles [1 mark]

From (an area of) low concentration to high concentration or against a concentration gradient [1 mark]

Requires energy or requires ATP [1 mark]

(2 marks)

If you use the term concentration gradient, make sure you don't say 'along' a concentration. It's either up or down, or against, depending on whether you're taking about diffusion or active transport.

1 (b) Describe, as fully as you can, how urine is produced by the kidneys.

Blood is filtered [1 mark]

Large molecules not filtered [1 mark]

Reabsorption of glucose [1 mark]

Reabsorption of ions [1 mark]

Reabsorption of water [1 mark]

No reabsorption of urea/excess ions/excess water [1 mark]

Glucose reabsorbed by diffusion [1 mark] and active transport [1 mark]

Water reabsorbed by osmosis [1 mark]

(5 marks)

This is pretty straight forward and just a question of remembering the steps in how the kidney works. This and the next question could easily be six mark questions, so well worth learning the terms and steps.

1 (b) (i) A person with one type of kidney disease is found to have protein in his urine. Suggest an explanation for the presence of protein in the urine.

Protein/large molecules or large particles filtered by the kidney [1 mark]

and not reabsorbed [1 mark]

Or (diseased) kidney allowing large molecules/particles/protein to filter [1 mark]

(2 marks)

2 A person with the kidney disease could be treated either by using a dialysis machine or by a kidney transplant operation.

Compare the advantages and disadvantages of these two methods of treatment.

Use your knowledge and understanding of the two methods in your answer.

advantages of transplant over dialysis

- no build-up of toxins / keeps blood concentration constant
- prevent high blood pressure
- don't need restricted diet / restricted fluid intake or time wasted on dialysis
- blood clots may result from dialysis
- infection may result from dialysis
- with dialysis, blood may not clot properly due to anti-clotting drugs
- cost issues (i.e. transplant cheaper)

disadvantages of transplant over dialysis

- rejection / problem finding tissue match
- use of immuno-suppressant drugs leading to other infections
- dangers during operation

This just about covers all the advantages and disadvantages of kidney transplant vs dialysis.

(4 marks)

(Total 13 marks)