14 Excretion and the kidneys

1 Name four substances that have to be excreted from the body.

2 Name three organs which have an excretory function.

3 Supply the missing words in the following paragraph:
Blood is taken to the kidney in the …. (A)…. artery, which divides up into many arterioles. The arterioles enter the …. (B) …. of the kidney and supply thousands of glomeruli. In each glomerulus, …. (C) …. forces plasma minus its …. (D) …. out of the capillaries, and it collects in the …. (E) …. .This liquid passes down the …. (F) …. where …. (G) …. , ….(H) …. and …. (I) …. are reabsorbed into the blood. The remaining liquid, called ….. (J) ….. passes down the ….. (K) ….. and collects in the ….. (L) ….. before being expelled from the body.

4 In hot weather the urine becomes
(a) more concentrated and lighter in colour;
(b) more concentrated and darker in colour
(c) less concentrated and lighter in colour
(d) 1ess concentrated and darker in colour.

5 Which of the following substances would you not normally expect to find in a sample of urine?
(a) uric acid, (b) ammonia, (c) glucose, (d) sodium chloride, (e) urea.

6 Blood in the renal vein differs from that in the renal artery by having
(a) less oxygen, more carbon dioxide and less urea
(b) more oxygen, 'more carbon dioxide and less urea
(c) less oxygen, less carbon dioxide and less urea
(d) less oxygen, more carbon dioxide and more urea,

7 In what ways is water lost from the body?

8 If the concentration of solutes in the blood rises above a certain level, then
(a) more water is reabsorbed in the kidney tubules
(b) less water is reabsorbed in the kidney tubules
(c) more salt is reabsorbed in the kidney tubules
(d) less glucose is reabsorbed in the kidney tubules,

9 In a dialysis machine, which one of the following combination of substances is allowed to escape from the patient's blood into the bathing solution?
(a) Salts, water and glucose.
(b) Salts, urea and glucose.
(c) Water, urea and uric acid.
(d) Water, uric acid and glucose.

10 State two procedures which are used to reduce the chances of a kidney graft being rejected.

11 Make a table to show three organs which have a homeostatic function and in each case indicate two of the substances whose concentration they control.

14 Excretion and the kidneys - answers

1 Carbon dioxide, urea, uric acid, spent hormones, excess water and salts (any four) have to be excreted from the body.

2 The kidneys, lungs and liver have an excretory function.

3 The missing words are (A) renal, (B) cortex, (C) blood pressure, (D) proteins, (E) Bowman's capsule (or renal capsule), (F) renal tubule, (G) glucose, (H) salts, (I) water, (J) urine, (K) ureter, (L) bladder.

4 (b) In hot weather, urine becomes more concentrated and darker in colour.

5 (c) You would not normally expect to find glucose in a urine sample.

6 (a) Blood in the renal vein will have less oxygen and more carbon dioxide (as a result of the kidney's respiration) and less urea, than blood in the renal artery.

7 Water is lost from the body by evaporation (lungs and skin), urination and defaecation (faeces always contain water).

8 (a) If the concentration of solutes in the blood rises, more water is reabsorbed in the kidney tubules. (This helps to reduce the concentration of the blood.)

9 (c) Water, urea and uric acid can pass through the dialysis tubing into the bathing solution. (You could argue that, if the patient's blood contained excessive salts or glucose, these too would escape.)

10 Drugs are used to suppress the patient's immune response to foreign tissue. The donor is as closely related as possible to the patient (or the tissue types are very similar).

11

Organ	Substances regulated
Lungs	oxygen, carbon dioxide
Liver	glucose, amino acids
Kidneys	urea, uric acid, water, salts