**The Kidney: Study Questions**

1. Why is excretion important for living organisms?
2. a) Draw a diagram of the human kidney. Fully label it.

b) Draw a diagram of a nephron. Fully label it.

1. State the function of the following:
   1. Glomerulus
   2. Bowman’s Capsule
   3. Loop of Henle
   4. Collecting duct
2. What is composition of the filtrate that enters the Bowman’s capsule?
3. List three components of the blood which are not pushed into the glomerular filtrate
4. What occurs in the proximal convoluted tubule?
5. Explain the significance of the following elements of selective reabsorption.

|  |  |
| --- | --- |
| Convolutions of the tubule |  |
| Microvilli |  |
| Mitochondria |  |
| Protein pumps and channels |  |
| Osmosis |  |

1. Identify the part of the kidney where the following is reabsorbed and by which processes each is absorbed (active or passive transport)
   1. water
   2. salts (eg – Na+, Cl-)
   3. glucose
2. Where in the Kidney is glucose concentration the greatest? Where is it the least?
3. A major function of the kidney is to maintain the balance of water in the blood.
4. Define *osmoregulation*.



1. List three functions of water in animals.



1. State the location of osmoregulation in the kidney.



1. Distinguish between the descending and ascending parts of the loop of Henle.



1. What determines if water is reabsorbed from the collecting duct?

1. The plasma solute concentration, plasma antidiuretic hormone (ADH) concentration and feelings of thirst were tested in a group of volunteers. These graphs show the relationship between intensity of thirst, plasma ADH concentration and plasma solute concentration.

***(Question taken from the QuestionBank CDRom)***



[Source: adapted from C T Thompson, *et al* ., (1986), *Clinical Science London*, **71**, page 651]

(a) Identify the plasma ADH concentration at a plasma solute concentration of 300 mOsmol kg-1 using the line of best fit.

**(1)**

(b) Compare intensity of thirst and plasma ADH concentration.

**(1)**

(c) Outline what would happen to plasma solute concentration and ADH concentration if a person were to drink water to satisfy his/her thirst.



**(2)**

(d) State **two** reasons why a person’s plasma solute concentration may increase.



**(2)**

**(Total 6 marks)**