**1.** In the following diagram of the kidney, which structure contains urine?



(Total 1 mark)

**2.** The diagram below shows a longitudinal section through a kidney. What is the structure labelled Z and what is its function?



|  |  |  |
| --- | --- | --- |
|  | **Structure Z** | **Function** |
| A. | cortex | osmoregulation |
| B. | medulla | ultrafiltration |
| C. | cortex | ultrafiltration |
| D. | pelvis | osmoregulation |

(Total 1 mark)

**3.** (a) Define the term *excretion*.

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......................................................................................................................................

(1)

(b) Explain the process of ultrafiltration.

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......................................................................................................................................

(2)

(c) The diagram below shows part of the human kidney. The arrow shows the direction of blood flow.



Compare the composition of the fluids found in the regions labelled I and II by giving **one** difference and **one** similarity.

Difference: ...................................................................................................................

......................................................................................................................................

Similarity: ....................................................................................................................

......................................................................................................................................

(2)

(Total 5 marks)

**4.** In the diagram of the nephron below, what structures are indicated by the letters Y and Z?



[Source: adapted from http://ex.susd.org/sjones/SGHL12007 files/image005.jpg]

|  |  |  |
| --- | --- | --- |
|  | **Y** | **Z** |
| A. | glomerulus | collecting duct |
| B. | Bowman’s capsule | collecting duct |
| C. | Bowman’s capsule | distal convoluted tubule |
| D. | glomerulus | distal convoluted tubule |

(Total 1 mark)

**5.** Which of the following best describes what happens in the glomerulus?

A. Selective reabsorption of water and molecules by active transport

B. Ultrafiltration introduces water and other molecules into the capillaries

C. Regulation of salt balance leading to the production of urine

D. High blood pressure forces water and other molecules into the nephron

(Total 1 mark)

**1.** D

**[1]**

**2.** C

**[1]**

**3.** (a) removal of waste products of cell reactions/metabolic activities/pathways 1

(b) blood (in the glomerulus) under high pressure caused by difference in diameter of (afferent and efferent) arterioles; fluid plasma and small molecules forced into kidney tubule/ Bowman’s capsule/through fenestrations/basal membrane; which prevent larger molecules/blood cells from passing through; 2 max

(c) *difference*: fluid at II has less urea/glucose/oxygen/salts/ions/water; *similarity*: fluid at II has same (amount of) proteins/blood cells as fluid at I; 2 *Accept converse for both marking points.*

**[5]**

**4.** C

**[1]**

**5.** D

**[1]**