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1

(a) Complete the passage below that describes part of the structure and function of
a human kidney.
The kidneys are positioned on each side of the spine, below the lowest rib. A blood
vessel called the supplies the kidney with
blood. The blood then passes a fine network of capillaries that
make up the glomerulus. Molecules in the blood with a relative molecular mass (RMM)
less than then move into the Bowman's capsule in a process
called[5]
(b) The filtrate then undergoes selective reabsorption.
Outline the process of selective absorption.
The quality of your written communication will be assessed in this question.
[4]
The filtrate in the Bowman's capsule is taken from three patients, A, B and C.
A biuret test is then used on the filtrate.
The results obtained are shown in Table 1 .

Patient	Colour of filtrate after reagent has been added
Α	pale blue
В	light purple
С	dark blue



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(c) State the macromolecule that is being tested for using the reagent.
[1]
(d) Using the information in Table 1, suggest and explain which of the patients is most
likely to suffer from kidney failure.
[3]
An individual with kidney failure can choose to undergo renal dialysis.
(e) Describe the general process of renal dialysis.
[3]
(f) It is said that it is vital that renal dialysis is combined with a carefully monitored diet.
Suggest what is meant by a 'carefully monitored diet' and explain why such a diet is
important for a patient undergoing dialysis treatment.
[3]
[Total: 19]





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2

Joshua is 19 years old and studies a demanding course at a university.
He suffers from kidney failure and his doctor recommends that he chooses dialysis rather
than a kidney transplant. Joshua has the choice of haemodialysis or peritoneal dialysis.
(a) Evaluate the advantages and disadvantages of the two dialysis methods for Joshua.
[4]
(b) Describe how scientists can test a urine sample for the presence of anabolic steroids.
The quality of your written communication will be assessed.
[3]
[Total: 7]



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CM:

3	(a) Briefly explain, using the example of osmoregulation, what is meant by the term
	'homeostasis'.
	[4]
	(b) Individuals who suffer from a condition called epilepsy may take drugs to control
	reflexive seizures.
	A number of these drugs contain a compound called diphenylhydantoin (DPH).
	DPH inhibits the hormone ADH.
	By considering how ADH is secreted, suggest how DPH inhibits ADH and the
	implications of this on homeostasis.
	[4]
	(c) Before DPH was found to inhibit ADH, it was thought that only ethanol and water
	were ADH inhibitors.
	Explain the significance of this finding and how DPH can be used to benefit some
	patients.
	[2]
	[Total: 10]



