

WJEC (Wales) Biology GCSE
Topic 2.6 Kidneys and
Homeostasis
Questions by Topic - Mark
Scheme

1.		Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)			1	<u>Decrease</u> in water (in blood) / low water content (of blood)/ increase in concentration of blood;			Lack of water
(b)			3	More water (re)absorbed; Into the {blood/ capillaries}; Urine {becomes more concentrated/ contains less water};		Smaller volume	
Total Mark			4				

2.		Question	Marking details	Marks Available
(a)				
(ii)		Protein (molecules) too big to pass through {filter/capillaries/ glomerulus/ Bowmans capsule};		1
(b)		Any three from: number in <u>each group</u> ; age; gender; period of time of treatment; diet (food or water); NOT amount species; type; {dose/mass/volume} of {endaravone/drug}		3
(c)		Repeat/ larger sample;		1

3. Marking details

Marks Available

Indicative content

6

The brain monitors whether there is too much water in the blood, and so little ADH is released. Dilute urine is excreted because the kidney tubules do not absorb much water to pass it back to the blood. If there is too little water in the blood, then more ADH is released causing concentrated urine to be excreted because the kidney tubules absorb a lot of water and pass it into the blood.

5-6 marks

The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.

3-4 marks

The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.

1-2 marks

The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.

0 marks

The candidate does not make any attempt or give a relevant answer worthy of credit

4.	Question			Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)	(i)		Shortage of {donors/ kidneys}/ (dangers of) { surgery/ long term immunosuppressants}/ may need to be replaced in the future/ may have to wait a long time for a kidney	1			1		
		(ii)		antigens <u>on</u> cells of donor kidneys (1) white blood cells produce antibodies (specific to antigens) (1) that {destroy/ act against} the {antigens/cells} (1) Reject {kill/ fight/ attack} antigens		3		3		

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
(a)	(i)	filtration under pressure/ultrafiltration (1) small molecules/ correctly named small molecules e.g. {glucose/ urea/ water/ salts/ amino acids} {move from the <u>capillary knot/ glomerulus/ into the Bowman's capsule}</u> (1)	2			2		
	(ii)	It has been (selectively) reabsorbed into the {blood/ capillaries}		1		1		
	(iii)	(proximal convoluted) tubule	1			1		
(b)		water has been {reabsorbed/ taken back into blood} (therefore % composition changed)		1		1		
Question 5 total			3	2	0	5	0	0

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	3	B and urine out of kidney/ to bladder ; D and urethra (1) correct spelling only Bladder and {stores/holds} urine;	Keeps urine		
(b)	i	Any 2 for 1 mark (excess) water, salt(s) and urea;	One correctly named salt		
	ii	Increased/ becomes stronger/ gets higher;			
Total Mark		5			

7.	Question	Marking details	Marks Available
	(a)	(i) Excretion ; NOT filtration	1
	(b)	(i) 28 and 39;	1
		(ii) 4 bars each correct height with label – 3 marks 3bars each correct height with label – 2 marks 2 bars each correct height with label – 1 mark ½ small square tolerance in plotting height <i>Correct order (either way)</i> Kidney (family donor) Kidney (non-family donor) Lung Heart Liver Allow <u>all</u> bars correct height and in sequence but <u>no</u> labels = 1 mark	3
		(iii) They have been done for different lengths of time/ some have been done for longer (time than others);	1
		(iv) Less likely to be rejected; NOT fail Because same/ similar/compatible <u>tissue type</u> ; NOT same cells	2
		Question 7 Total	[8]

8.

Question	Marking details	Marks Available								
(a)	(i)	2								
	<table border="0"><thead><tr><th>Scientific term</th><th>Description</th></tr></thead><tbody><tr><td>ureter</td><td>fluid leaving the kidney</td></tr><tr><td>urethra</td><td>tube carrying waste solution out of the body</td></tr><tr><td>urine</td><td>tube carrying waste solution to the bladder</td></tr></tbody></table>	Scientific term	Description	ureter	fluid leaving the kidney	urethra	tube carrying waste solution out of the body	urine	tube carrying waste solution to the bladder	
Scientific term	Description									
ureter	fluid leaving the kidney									
urethra	tube carrying waste solution out of the body									
urine	tube carrying waste solution to the bladder									
	2 (3) correct lines;; 1 correct = 1 mark, 2 correct = 2 marks									
	(ii) Excretion;	1								
(b)	(i) Ref to same tissue types/ blood types/ family {donor/ member} relative/ same tissue; NOT kidney that is similar	1								
	(ii) (Immune suppressant) drugs/ OWTTE; NOT drugs unqualified/ anti suppressant	1								
(c)	(i) Dialysis;	1								
	(ii) Regular {hospitalisation/treatment} / diet restrictions/ temporary/ every time they have {dialysis/ treatment} several times a week/ not a cure;	1								
	Question 8 total	[7]								

9.	Question	Marking details	Marks Available
	(a)	Removal of waste;	1
	(b)	(i) 68;	1
		(ii) I The salts enter urine/ excreted/ some are reabsorbed;	1
		II Concentration increases;	2
		Because water intake lower and percentage of intake that passes into urine is lower'/ because the volume of urine is lower;	

10.	Question			Marking details	Marks available						
					AO1	AO2	AO3	Total	Maths	Prac	
	10	(a)		ureter (carries urine out of kidney) correct spelling	1			1			
		(b)	(i)	Urea		1		1			
			(ii)	Less protein {in blood /leaving kidney}/ owtte (1) No change in glucose concentration/ owtte (1)			2	2			
		(c)		Any three (x1) from: 1. Survival declines with years after transplant 2. People survive longer with transplants from living donors 3. People survive longest with transplants from relatives/family 4. <u>Difference</u> between family donors and others increases with years after the transplant			3	3			
		(d)		Dialysis (not kidney machine, unqualified)	1			1			
				Question 10 total	5	2	5	12	0	4	

11.	Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
	(a)	i	2	X = <u>Renal</u> artery; Y = <u>Renal</u> vein;	Afferent/ efferent	
		ii	1	Clots would clog the pump/ stop blood flow/ prevent blockage;		
		iii	1	Diffusion/ ultrafiltration;		
		iv	1	{maintains/ increases} concentration gradient/ allows { <u>maximum/greatest</u> } rate of diffusion or removal of waste;		
	(b)		1	Have a kidney transplant;	peritoneal dialysis	
	Total Mark		6			