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A2 Biology OCR

Unit F214: Communication, Homeostasis and Energy

Module 2.1 Excretion

Answers

1. A – sinusoid ;
 B – (branch of) bile duct ;
 C – (branch of hepatic) portal vein / HPV ;
 D – (branch of) hepatic artery ;

[4]

2. (i) *award both marks for correct answer
 evidence of $14.7 - 2.2 = 12.5$ or $14.7 / 2.2$ gains one calculation mark*

$$12.5/2.2 \times 100;$$

$$= 568.2 / 568 / 570;;$$

2

- (ii) protein converted to amino acids;
 excess amino acids undergo deamination / removal of amino group;
 ammonia formed;
 ammonia converted to urea;

AVP; e.g. ref. to ornithine cycle

max 3

[5]

3. (i) **Mark the first answer. If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = 0 marks**

ultrafiltration;

*This term required but **ACCEPT** phonetic spelling*

1

- (ii) 17.9;;

Correct answer = 2 marks

If answer incorrect, not rounded or incorrectly rounded then allow 1

mark for working

$$125 \div 700$$

or

an unrounded answer e.g. 17.857412

2

[3]

4. (a) (i) wide / large, afferent arteriole;
narrow / small, efferent arteriole;
- afferent arteriole, wider / larger, than efferent arteriole – 2 marks*
- ref to 'bottleneck' effect / AW; **R** build up pressure on own
to achieve filtration;
must be greater than 6.7 kPa for filtration; 2
max
- (ii) *award two marks if correct answer (1.3) is given
incorrect answer (or no answer) but correct working = 1 mark*
- 8 – (4 + 2.7) **A** 8 – 6.7 2
1.3;;
- (b) (i) (too) large / RMM greater than 69000 or 70000;
to pass through basement membrane; 2
- (ii) glomerular blood pressure is greater;
proteins forced through;
damage to capillaries / AW;
damage to basement membrane; 2
max
- (c) 1 endothelium of capillaries;
2 large / many, fenestrations / gaps / holes;
3 modified epithelial cells of capsule / podocytes;
4 slit pores / foot-like processes; **A** finger like
5 basement membrane;
6 made up of, collagen / glycoproteins / molecular mesh;
- accept annotated diagrams* 4
max
- (d) 1 volume will increase;
2 concentration decrease;
3 (wall of), collecting duct / DCT, (relatively) impermeable to water;
4 fewer water channels; **A** aquaporins
5 in membrane of epithelial cells;
6 less water reabsorbed (from the urine);
7 by osmosis (linked to marking point 6);
8 drinking increases liquid intake and therefore liquid loss; 4
max

[16]

5. (i) **Mark the first answer. If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = 0 marks**

(cuboidal) epithelium / epithelial;

DO NOT CREDIT 'epithelium cells' / 'ciliated epithelium' / 'squamous epithelium' / endothelium

ALLOW columnar epithelium

1

- (ii) **Mark the first answer. If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = 0 marks**

microvilli / microvillus;

ACCEPT 'brush border'

DO NOT CREDIT cilia

1

- (iii) **This is a QWC question**

1 selective **reabsorption**;

2 of glucose **and** amino acids;

DO NOT CREDIT if glucose & amino acids & proteins

3 **co-transport** / **facilitated diffusion** / uptake described;

ACCEPT direct uptake, of glucose / amino acids, by active transport

4 water follows by **osmosis** so concentration of, ions / nitrogenous waste / urea / remaining substances, increases;

5 AVP;

e.g.

- *microvilli provide large surface area for uptake*
- *many mitochondria provide energy for uptake*
- *many brush border enzymes (ATPase) for active uptake*
- *active secretion of nitrogenous waste into lumen*

3 max

QWC - technical terms used appropriately and spelt correctly;

Use of **three** terms from:

reabsorption (or derived term),

co-transport (or derived term),

facilitated diffusion, osmosis

1

[6]

6. the longer the loop of Henle the lower the water potential (of urine); ions pass out from ascending limb into, medulla / tissue fluid; creating lower water potential in the medulla / AW; water reabsorbed from collecting duct in medulla; by osmosis; (*linked to previous marking point*)

AVP; e.g. ref to countercurrent multiplier

max 3

[3]

7. CG acts as antigen;
 move, attached to, free antibodies;
 attach to, immobilised antibody;
 coloured particles, form line;
 ref to complementary shapes;
 ref to antigen, antibody complex;
 AVP; e.g. further detail of antibody structure
 monoclonal
 CG-antibody complex

4 max

[4]