Question number	Answer	Notes	Marks
1 (a) (i)	artery / arteries / aorta;		1
(ii)	atrium / left or right atrium / left or right atria / left or right auricle;		1
(iii)	1. fewer chambers / two chambers / one atrium / one ventricle / eq; 2. f er valves / eq; 3. n separation of left and right sides / no septum / no left and right atria / no left and right ventricles; 4. c mber walls have similar size / eq; 5. f er blood vessels / only two blood vessels / eq;	allow converse for <u>human</u> heart 3. ignore ref to circulation / blood flow	3

(b)	1. ss oxygen/deoxygenated in fish heart; 2. re carbon dioxide in fish heart; 3. oxygen used in respiration; 4. carbon dioxide produced by respiration;; 5. b od oxygenated in human lungs; 6. carbon dioxide removed in human lungs;	allow converse for blood in human heart	4
(c)	1. single circulatio / no separate lung circulation / blood passes through heart once / blood in fish has to pass through two sets of capillaries / eq; 2. fish are smaller / fish have smaller heart / fish heart has thinner walls;	allow converse for human	2

Total 11 marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>2
((a)</td><td>1. narrower lumen / eq;
2. thicker wall;
3. more muscle / stronger muscle / eq;
4. more elastic;
5. no valves;</td><td>Ignore blood flow

Allow converse</td><td>2</td></tr>
<tr><td>(b)(i)</td><td><table><tr><th>Name of blood vessel</th><th>Letter</th></tr><tr><td>vena cava</td><td>L or N</td></tr><tr><td>aorta</td><td>C;</td></tr><tr><td>pulmonary vein</td><td>B;</td></tr><tr><td>hepatic artery</td><td>D;</td></tr><tr><td>renal vein</td><td>I;</td></tr></table></td><td>Reject B and D and B or D</td><td>4</td></tr>
<tr><td>(b)(ii)</td><td><table><tr><th>Contents of blood vessel</th><th>Letter of blood vessel</th></tr><tr><td>contains the most glucose after a meal</td><td>J;</td></tr><tr><td>contains the least urea</td><td>I;</td></tr><tr><td>contains the least oxygen</td><td>M;</td></tr></table></td><td></td><td>3</td></tr>
</table>

Total 9 marks

Question number	Answer	Notes	Marks
3(a)	1. water; 2. minerals / ions / salts / named mineral ion / eq;	 Ignore nutrients Allow 2 marks for 2 named minerals;	2
(b)	1. shape; Then max 4 from: 2. cell wall; 3. cell membrane; 4. cytoplasm; 5. nucleus; 6. vacuole;	Palisade cell labelled = max 4	5

Total 7 marks

Question number	Answer	Notes	Marks
4 (a) (i)	lung / lungs;		1
(ii)	1. ga s oxygen / oxygenated /eq; 2. ss of carbon dioxide / eq;	Ignore refs to pressure / velocity Ignore colour change	2
(b)	prevent backflow / eq;		1
(c) (i)	0.3;		1
(ii)	3;		1
(iii)	75;; allow one mark for 0.8 / 24 / 2.4 in working		2
			Total 8 marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>5 (a)</td><td>
<table>
<tr><th>Statement</th><th>R blood cells</th><th>White blood cells</th></tr>
<tr><td>transport oxygen</td><td>✓</td><td>X</td></tr>
<tr><td>contain a nucleus</td><td>X</td><td>✓;</td></tr>
<tr><td>produce antibodies</td><td>X</td><td>✓;</td></tr>
<tr><td>biconcave shape</td><td>✓</td><td>X;</td></tr>
<tr><td>ingest pathogens</td><td>X</td><td>✓;</td></tr>
<tr><td>numbers may increase following infection</td><td>X</td><td>✓;</td></tr>
</table>
</td><td>no mark if blank is left

no marks for two crosses or two ticks in a row

no mark for hybrid tick cross</td><td>5</td></tr>
<tr><td>(b)</td><td><u>more</u> oxygen;
haemoglobin;
muscles;
respiration;
(less) anaerobic respiration;
(less) lactic acid / (less) oxygen debt /(less) fatigue / (less) cramp;
more energy;
run faster / run longer / run further / less tired / eq;</td><td></td><td>4</td></tr>
</table>

<table>
<tr><th>Question number</th><th>Answer</th><th></th><th>Marks</th></tr>
<tr><td>5 (c)</td><td>short race / quick race / short time / short distance / eq;

oxygen not needed / no need to breathe / eq;

<u>anaerobic</u> respiration;</td><td></td><td>2</td></tr>
<tr><td></td><td></td><td>Total</td><td>11</td></tr>
</table>