

CHERRY HILL TUITION AQA BIOLOGY AS PAPER 16 MARK SCHEME

1)

(a)	(Blood) plasma;	1	
(b)	More/larger proteins / less urea/carbon dioxide / more glucose/amino acids/fatty acids/oxygen/ high(hydrostatic) pressure;	1	Q Reference to blood cells/water potential = neutral Q No Protein should not be credited
(c)(i)	Contracts;	1	Q Do not accept pumping of heart/heart beating
(c)(ii)	Loss of fluid/volume; Friction/resistance (of capillary wall);	1 max	Q Reference to a narrow lumen is not sufficient to gain a mark unless friction or resistance is mentioned.
(d)	Water potential (in capillary) not as low/is higher/less negative / water potential gradient is reduced; More tissue fluid formed (at arteriole end); Less/no water absorbed (into blood capillary); by osmosis; (into blood capillary);	3 max	Q The last two marking points must be in context of movement into the blood capillary

2)

(a)(i)	Two marks for correct answer of 4.3; One mark for incorrect answer that clearly shows understanding of $\frac{\sum n(n-1)}{188}$ as denominator;	2	Q An answer of 4 scores 1 mark
(a)(ii)	Measures number of individuals (of each species) <u>and</u> number of species; Some species only present in small numbers;	2	Q First marking point can only be awarded if there is a reference to species.
(b)(i)	Reduced as one crop/species grown / other species removed; Use of herbicides/weeding/ploughing; Wheat (better) competitor for named factor e.g. light/nutrients;	2 max	
(b)(ii)	(Reduced) as less variety of food sources; (Reduced) as fewer habitats/niches; (Reduced) by pesticides/chemicals;	2 max	Q Answers only referring to 'less food' should not be credited

3)

(a)	Filaments/lamellae provide <u>large surface area</u> ; Thin/flattened <u>epithelium</u> / one/two cell layers so short <u>diffusion</u> pathway (between water and blood); Countercurrent/blood flow maintains concentration/diffusion gradient;	2 max	Q Do not credit thin cell walls/membranes
(b)(i)	Large/wide range of values (so can fit on graph);	1	
(b)(ii)	Decrease in uptake with increase in mass / negative correlation;	1	
(b)(iii)	Enables comparison; As animals differ in size/mass;	2	
(b)(iv)	Smaller animals have larger surface area to volume ratio; Lose more heat per gram of tissue; Respire more/faster (relative to body mass); Oxygen used in respiration;	3 max	Allow converse for larger animals. Allow appropriately named animal as an alternative to smaller or larger animals.

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4)

(a)	Recognition of same species; Stimulates release of gametes; Recognition of mate/opposite gender; Indication of sexual maturity/fertility;	2 max	
(b)(i)	Internal fertilisation / fertilisation occurs in pouch/limited area;	1	Q The term fertilisation is not required in the answer but must be implied.
(b)(ii)	Protection from predators (developing in pouch);	1	
(c)(i)	Less stress caused to seahorse / quicker/more accurate method / body is curved / head is linear;	1	Q Do not accept "easier" unless qualified.
(c)(ii)	Head length proportional to body length/or described;	1	
(d)	Positive correlation between head/body lengths of male and female/ female and male with similar head/body lengths pair together;	1	
(e)	Use line of best fit; And extrapolate/extend line as required;	2	
(f)	(Compare) DNA; Sequence of bases/nucleotides; DNA hybridisation; Separate DNA strands / break hydrogen bonds; Mix DNA/strands (of different species); Temperature/heat required to separate (hybrid) strands indicates relationship; Compare same/named protein; Sequence of amino acids /primary structure; <u>Immunological evidence</u> – not a mark Inject (seahorse) protein/serum into animal; (Obtain) antibodies/serum; Add protein/serum/plasma from other (seahorse) species; Amount of precipitate indicates relationship;	6 max	Q The marks awarded for reference to DNA and sequence of bases/nucleotides must be in a different context to DNA hybridisation.

5)

(a)	1. (Risk) decreases, then increases; 2. (Risk) increases from 2 (drinks per day);	2	2. Accept increases risk above 3
(b)	Age affects heart disease / age affects how alcohol affects the body;	1	Accept age affects results Accept 'removes confounding variable' Accept 'controlling a variable'

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(c)	<ol style="list-style-type: none"> <li>1. (True because) studies show decreased risk up to 3 drinks per day;</li> <li>2. (False because) eg all show an increased risk above 5 drinks / day, eg A and B, show increased risk (of heart disease) above 4 per day;</li> <li>3. Data only about heart disease/alcohol causes other diseases/social problems;</li> <li>4. Amount of alcohol per drink may vary;</li> <li>5. May be due to other factor</li> </ol>	<p>1</p> <p>2 max</p>	<p>To gain 3 marks candidates must have mp1 and 2 from mps 2-5</p> <ol style="list-style-type: none"> <li>1. Accept any <u>evidence</u> from graph</li> <li>2. Accept any <u>evidence</u> from graph</li> </ol>
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6)

(a)	<ol style="list-style-type: none"> <li>1. Flatten/moves down;</li> <li>2. (Diaphragm muscle) contracts;</li> </ol>	2	<ol style="list-style-type: none"> <li>1. Ignore: additional information about rib movements</li> </ol>
(b)	<ol style="list-style-type: none"> <li>1. Diaphragm contracts/moves down/ flattens;</li> <li>2. Increases volume (of thorax);</li> <li>3. Decrease in pressure;</li> <li>4. Air moves from high to lower pressure/down pressure gradient;</li> </ol>	3 max	<p>Ignore refs to rib movement</p> <ol style="list-style-type: none"> <li>3. Accept pressure lower than atmospheric pressure</li> <li>4. Reject: by diffusion</li> </ol>
(c)	<ol style="list-style-type: none"> <li>1. Diffusion;</li> <li>2. Across (alveoli)epithelium/ (capillary) endothelium;</li> </ol>	2 max	<ol style="list-style-type: none"> <li>Accept down diffusion gradient</li> <li>2. Accept: capillary epithelium/squamous cell</li> </ol>

7)

<ol style="list-style-type: none"> <li>1. Stops/ reduces /inhibits respiration;</li> <li>2. No/less energy released/ ATP produced;</li> <li>3. (ATP/energy needed) for active transport;</li> </ol>	3	<ol style="list-style-type: none"> <li>1. Accept: inhibits respiratory enzymes</li> <li>2. Ignore: less energy produced/ made</li> <li>3. Accept ref to Na<sup>+</sup> pump/ description of active transport</li> </ol> <p>Ignore consequences of less Na<sup>+</sup> in cell</p>
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8)

a)	<ol style="list-style-type: none"> <li>1. SAN → AVN → bundle of His /Purkyne fibres;</li> <li>2. Impulses / electrical activity (over atria);</li> <li>3. Atria contract;</li> <li>4. Non-conducting tissue (between atria and ventricles);</li> <li>5. Delay (at AVN) ensures atria empty/ ventricles fill before ventricles contract;</li> <li>6. Ventricles contract from apex upwards;</li> </ol>	5 max	1. Mark for correct sequence
b)	<ol style="list-style-type: none"> <li>1. Too much saturated fat/ cholesterol in diet;</li> <li>2. Increase in LDL/ cholesterol in blood;</li> <li>3. Atheroma/ fatty deposits/ plaques in artery walls;</li> <li>4. Reduces diameter of / blocks <u>coronary</u> arteries;</li> <li>5. Less oxygen/ glucose to heart muscle /tissue/ cells;</li> <li>6. Increase in blood pressure;</li> <li>7. (Increased risk of )clot / thrombosis / embolism/ aneurysm;</li> </ol>	5 max	<p>1. Accept: Too much salt / alcohol</p> <p>Marking points 6 and 7 can be awarded in the context of salt</p>