

Question		Mark	Guidance
1 (a)	<b>V</b> stomach ; <b>W</b> large intestine / colon / rectum ;	[2]	I intestine unqualified
(b)	breaks up food into small(er) pieces ; without chemical change ; by teeth / muscles ; to mix (with digestive juice) ; increases surface area ; for enzyme action ; speeds up <u>chemical</u> digestion ; easier to swallow ;	[3]	<b>R</b> molecules <b>A</b> without enzymes <b>A</b> mastication / chewing / churning  <b>A</b> easier / more effective
(c)	<i>for:</i> positive correlation / as (relative) body mass increases, time in digestive system increases ; any two or more figures from the graph ;  <i>against: max 3 from</i> two / one / few / some (species), are outliers / anomalies ; any figure(s) from the graph ;  (description of) some mammals do not fit the, pattern / trend ; any example from the graph ;  only information about 26 species of mammal / small sample size ; idea about unknown validity ;	[max 4]	units must be quoted at least once  e.g. either outlier quot
		<b>[Total: 9]</b>	

Question				Mark	Additional Guidance																		
2 (a) (i)	<b>G</b> oesophagus/esophagus/gullet ; <b>H</b> diaphragm ; <b>M</b> large intestine/large bowel/colon ;			[3]	<b>R</b> intestine unqualified/rectum																		
(ii)	<table border="1" data-bbox="315 364 1238 1025"> <thead> <tr> <th data-bbox="315 364 638 465">function</th> <th data-bbox="638 364 963 465">name</th> <th data-bbox="963 364 1238 465">letter from Fig. 3.1</th> </tr> </thead> <tbody> <tr> <td data-bbox="315 465 638 597">conversion of glucose to glycogen</td> <td data-bbox="638 465 963 597">liver</td> <td data-bbox="963 465 1238 597"><b>P</b> ;</td> </tr> <tr> <td data-bbox="315 597 638 698">secretion of insulin and glucagon</td> <td data-bbox="638 597 963 698">pancreas</td> <td data-bbox="963 597 1238 698">K</td> </tr> <tr> <td data-bbox="315 698 638 830">absorption of products of digestion</td> <td data-bbox="638 698 963 830">ileum/small intestine</td> <td data-bbox="963 698 1238 830"><b>L</b> ;</td> </tr> <tr> <td data-bbox="315 830 638 931">storage of bile</td> <td data-bbox="638 830 963 931">gall bladder</td> <td data-bbox="963 830 1238 931"><b>O</b> ;</td> </tr> <tr> <td data-bbox="315 931 638 1025">chemical digestion of protein in an acidic pH</td> <td data-bbox="638 931 963 1025">stomach</td> <td data-bbox="963 931 1238 1025"><b>J</b> ;</td> </tr> </tbody> </table>			function	name	letter from Fig. 3.1	conversion of glucose to glycogen	liver	<b>P</b> ;	secretion of insulin and glucagon	pancreas	K	absorption of products of digestion	ileum/small intestine	<b>L</b> ;	storage of bile	gall bladder	<b>O</b> ;	chemical digestion of protein in an acidic pH	stomach	<b>J</b> ;	[4]	<b>ignore</b> bile duct
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2 (b) (i)	emulsification / emulsifying (fat) / producing an emulsion ;	[1]	R 'emulsion' unqualified									
	(ii) increases surface area ; for action of, lipase / enzyme(s) ;	[2]	A speeds up, enzyme reaction / breakdown of fat / absorption of fat A makes it easier to absorb									
(c) (i)	<table border="1" data-bbox="324 465 1095 795"> <thead> <tr> <th data-bbox="324 465 568 560">hormone</th> <th data-bbox="568 465 792 560">uptake by liver cells</th> <th data-bbox="792 465 1095 560">concentration of glucose in the blood</th> </tr> </thead> <tbody> <tr> <td data-bbox="324 560 568 662">insulin</td> <td data-bbox="568 560 792 662">inc</td> <td data-bbox="792 560 1095 662">decreases ;</td> </tr> <tr> <td data-bbox="324 662 568 795">glucagon</td> <td data-bbox="568 662 792 795">de</td> <td data-bbox="792 662 1095 795">increases / stays the same ;</td> </tr> </tbody> </table>	hormone	uptake by liver cells	concentration of glucose in the blood	insulin	inc	decreases ;	glucagon	de	increases / stays the same ;	[2]	one mark per correct row
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	(ii) adrenaline ;	[1]	A epinephrine, cortisol, ACTH, growth hormone, somatostatin, thyroxine, GLP-1, GIP									
(d)	glucose concentration is kept, (near) constant / within narrow limits / AW ; any change (in concentration), is detected / acts as a stimulus ; correct ref to, glucose → glycogen / glycogen → glucose / increasing glucose concentration / decreasing glucose concentration ; <i>idea that it returns concentration to normal ;</i> <i>idea that release of correctly named hormone, stops / switches off ;</i> ref to <u>homeostasis</u> ;	max [3]	R hormones carrying out conversions directly									
		<b>[Total: 16]</b>										

3 (a)	<p>1 <u>peristalsis</u> ;</p> <p>2 circular muscles contract (to push to food) ;</p> <p>3 muscle contraction <u>above</u> food pushes it forward ;</p> <p>4 circular and longitudinal muscles work antagonistically / AW ;</p>	max [2]	
(b) (i)	<p>P – epithelium/epithelial cell ;</p> <p>Q – (blood) capillary ;</p> <p>R – lacteal/lymphatic vessel ;</p>	[3]	<p><b>Reject</b> <u>ciliated</u> epithelium, epidermis, goblet cell</p> <p><b>Accept</b> epithelium with brush border</p>
(ii)	hepatic portal (vein) ;	[1]	
(iii)	<p>give a large surface area (of membrane) ;</p> <p>to increase / maximise, absorption ;</p> <p>by diffusion / by active transport ;</p>	max [2]	
(iv)	<p>enzymes / proteases / lipases ;</p> <p>(stomach) acid ;</p> <p>physical damage / AW ;</p> <p>parasites / (named) pathogens / toxins ;</p>	max [2]	
		<b>[Total:10]</b>	

<p><b>4 (a)</b></p> <p><b>1</b> ref to breakdown of <u>molecules</u> ;  <b>2</b> breaking bonds ;  <b>3</b> using enzymes ;  <b>4</b> insoluble to soluble ;</p> <p><i>mechanical digestion (max 2)</i></p> <p><b>5</b> ref to breakdown of, particle / molecule ;  <b>6</b> ref to increase surface area (for chemical digestion) ;  <b>7</b> to, mix /churn ;</p>		[max 3]																			
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<p>4 (c)</p> <p>1 less/no bile, secreted/released ;  2 (so) no/less, bile salts ;  3 enter small intestine/duodenum ;  4 no/less, <u>emulsification</u> of fat ;  5 less/no, increased surface area of fat (globules/AW)  6 for lipase ;  7 slower/harder, digestion ;</p>		[max 3]	<b>R</b> no digestion
<p>(d)</p> <p>1 coronary heart disease/CHD/heart attack/cardiac arrest/angina/myocardial infarction ;  2 reduced blood flow/blockage of artery <i>or</i> arteries ;  3 damaged/hardened artery wall/atheroma/atherosclerosis ;  4 (blood) clot/thrombus/thrombosis/(coronary) aneurysm ;  5 causes high blood pressure ;  6 reduced supply of, oxygen/nutrients, to heart tissue/muscle ;  7 muscle respire anaerobically ;</p>		[max 3]	<b>Ignore</b> cardiovascular disease/CVD  <b>A</b> narrowing of artery reduces blood flow
		<b>[Total:13]</b>	