

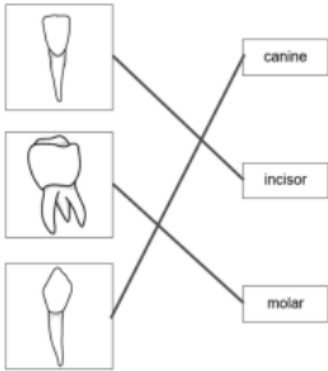
7. Human nutrition

7.3 Physical digestion

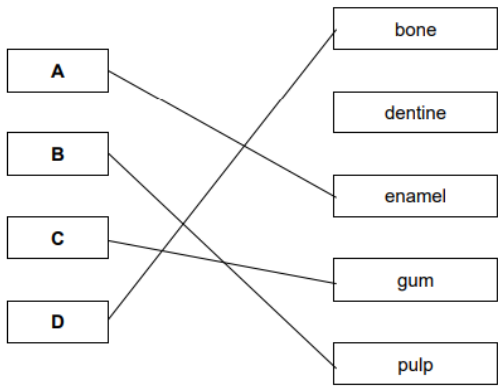
Paper 3 and 4

Marking Scheme

Q1.

(a)(i)	any three from: to increase surface area ; for chemical digestion ; by (named) enzymes ; AVP ;	3	e.g. ease of movement in the digestive system / so that it is more easily swallowed / prevent choking
(a)(ii)	stomach ;	1	
(b)(i)		2	R each additional line all 3 correct = 2 marks 1 or 2 correct = 1 mark
(b)(ii)	crush / grind / chew, food ;	1	
(c)	A enamel ; B dentine ; C pulp / nerves ; D cement ;	4	

Q2.

(a)		4	R each additional line
(b)	physical / mechanical ; pieces / AW ; surface ; enzymes ; chemical ;	5	
(c)	any two from: incisor ; canine ; pre-molar ; molar ;	2	

Q3.

(a)	<p><i>diagram labelled in this order:</i></p> <p style="text-align: center;"> enamel pulp dentine nerves gum </p> <p style="text-align: right;">..... *****</p>	4	5 correct labels = 4 marks 3 or 4 correct = 3 marks 2 correct = for 2 marks 1 correct label = 1 mark
(b)	<i>any two from:</i> canine ; incisor ; pre-molar ; molar ;	2	
(c)	<i>any three from:</i> (coating of) bacteria and food / plaque, on teeth ; bacteria respire (the sugars in food) ; (bacteria produce) acid ; dissolves, enamel / dentine ;	3	
(d)	<i>any two from:</i> brush (teeth) / use of toothpaste / flossing ; reduction in consumption of sugary, food / drink ; visits to dentist ; adequate, vitamin D / calcium, consumption OR fluorination of water ;	2	
(e)	mechanical ;	1	A physical

Q4.

(a)(i)	cement correctly identified with a label and a label line ; gum correctly identified with a label and a label line ; nerves correctly identified with a label and a label line ;	3	
(a)(ii)	piercing / tearing / gripping, (food) ;	1	
(b)	<p>letter from Fig 5.2</p> <p style="text-align: center;">name function</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">Q</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">incisor</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">biting off pieces of food</div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">R</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">molar</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">grinding food</div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">S</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">premolar</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">grinding food</div> </div> <p style="text-align: right;">..... *****</p>	5	mark by column first column: 3 correct names = 2 marks 1 or 2 correct names = 1 mark last column: 3 correct functions = 3 marks 2 correct functions = 2 marks 1 correct function = 1 mark R each additional line
(c)	mechanical ;	1	A physical

(d)(i)	<i>any four from:</i> (coating of) bacteria and food / plaque, on teeth ; bacteria respire (the sugars in food) ; (bacteria) produce acid ; (acid) dissolves, enamel / A / dentine / B ; <i>idea of</i> nerves / pulp cavity / C , exposed / reached / AW ;	4	
(d)(ii)	<i>any one from:</i> regular brushing (of teeth) / described ; ref. to less sugar in diet / AW ; regular use of toothpaste ; AVP ;	1	

Q5.

(a)	<table border="1"> <thead> <tr> <th>name of type of tooth</th><th>letter on Fig. 4.2</th><th>function</th></tr> </thead> <tbody> <tr> <td>canine</td><td>R</td><td rowspan="2">cut / rip / tear / pierce / grip / bite / separate / break into smaller pieces</td></tr> <tr> <td>incisor</td><td>S</td></tr> <tr> <td>molars</td><td>P</td><td>grinding</td></tr> <tr> <td>premolars</td><td>Q</td><td>tearing and grinding</td></tr> </tbody> </table>	name of type of tooth	letter on Fig. 4.2	function	canine	R	cut / rip / tear / pierce / grip / bite / separate / break into smaller pieces	incisor	S	molars	P	grinding	premolars	Q	tearing and grinding	4 one mark for each correct row
name of type of tooth	letter on Fig. 4.2	function														
canine	R	cut / rip / tear / pierce / grip / bite / separate / break into smaller pieces														
incisor	S															
molars	P	grinding														
premolars	Q	tearing and grinding														
(b)(i)	food left on teeth / AW ; ref. to bacteria ; (bacteria) respire sugar ; (bacteria) produce acid ; (acid) dissolves, enamel / dentine, / AW ; AVP ;	4														
(b)(ii)	clean teeth / AW or ref. to good oral hygiene ; use a fluoride toothpaste / drink water containing fluoride / AW ; visits to the, dentist / hygienist / AW ; eat fewer sugar-containing foods / AW or fewer acidic foods or drink ;	2														

Q6.

(a)	line drawn to an incisor tooth labelled incisor ; line drawn to a molar tooth labelled molar ;	2	
(b)(i)	<u>2</u> ;	1	
(b)(ii)	<u>4</u> ;	1	
(b)(iii)	D clean / brush / wash / floss, their teeth more, thoroughly or frequently / good oral hygiene / use of mouthwash ; D (more / regular) visits to the dentist / hygienist / AW ; D used a fluoride toothpaste / drank water containing fluoride / AW ; D ate fewer sugary foods / fewer acidic foods or drinks / has less, bacteria or plaque ; E thinner layer of enamel ; E ref. to overcrowding / overlapping (of teeth) ; E had deficiency in calcium ; E had deficiency in vitamin D ; AVP ; e.g. adult D is younger	2	
(b)(iv)	molar(s) ;	1	
(c)	(bacteria) respire sugar ; (bacteria) produce acid ; (acid) dissolves enamel or dentine / AW;	2	

Q7.

(a)	F : enamel ; G : dentine ; H : (named) blood vessel / nerve / pulp (cavity) ;	3	
(b)(i)	bite / tear / cut / hold / rip ; chewing / grinding / crushing / producing small(er) pieces / mechanical digestion ; increases surface area (of food) ; killing prey / defence / cleaning fur ;	2	
(b)(ii)	produces small pieces of food ; increases surface area ; easier to swallow food ;	2	

Q8.

(a)	ingestion ; incisors ; molars and premolars ; chewing / grinding / crushing / mashing / masticating ;	4	MP3 either order
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Q9.

(a)(i)	mechanical / physical, digestion ;	1	
(a)(ii)	<u>enamel</u> ;	1	
(a)(iii)	any three from: sugar / food / plaque, left on teeth ; respiration (of sugar) by bacteria ; produce (lactic) acid ; dissolves, enamel / dentine / AW ; AVP ;	3	e.g. dentine is exposed / AW or dentine, is softer / dissolves more rapidly (than enamel) or ref. to, pulp / nerve endings, being exposed or (decay reaches nerve endings) leading to pain

Q10.

(d)	any six from: 1 mechanical / physical, digestion / breakdown ; 2 (decrease particle size) increase surface area (of food for chemical digestion) ; 3 for (named) enzyme (activity) ; 4 any further detail of enzyme activity ; 5 chewing / crushing / grinding / AW, in the mouth / by teeth ; A mastication 6 incisor / canine, (teeth) for cutting food / AW ; 7 (pre)molar (teeth), crush food / AW ; 8 mixing of saliva with food / formation of bolus of food for swallowing ; 9 churning action / formation of chyme / AW, of stomach (3) ; 10 ref to action of muscles in the stomach (wall) ; 11 emulsification by bile ; 12 occurs in, small intestine / duodenum / ileum (5) ; 13 described as bile (salts) break(s) fat globules into smaller pieces / large fat droplets into small(er) droplets / AW ;	6	
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Q11.

(a)	A enamel ; B dentine ; C pulp / pulp cavity / nerve / sensory neurone / capillaries / blood vessels ; D gum ;	4	
(b)	<u>mechanical</u> / <u>physical</u> , digestion ; crushes food / chewing / grinds food / breaks food into smaller pieces ; increases surface area of food ; for (named) enzyme action / chemical digestion ; AVP ; e.g. mix food with saliva	3	
(c)	(named) food remains on teeth ; bacteria, use / breakdown, sugars / carbohydrate / sweet foods ; <u>respiration</u> ; acid is produced ; acid, dissolves / erodes / destroys / wears away / AW, enamel ; dentine is exposed / AW ; dentine, softer / dissolves more rapidly (than enamel) ; AVP ; e.g. decay reaches nerve endings leading to pain	4	

Q12.

(a)(i)	A dentine B cement C incisors D canine(s) E premolars F molars	3	6 / 5 correct = 3 marks 3 / 4 = 2 marks 1 / 2 = 1 mark
(a)(ii)	<u>mechanical</u> ;	1	
(b)(i)	acid ;	1	A carbon dioxide
(b)(ii)	enamel ; dentine ;	2	
(c)	(named) sugar ;	1	