

Cambridge Technicals Health and Social Care

Unit 4: Anatomy and physiology for health and social care

Level 3 Cambridge Technical Certificate/Diploma in Health and Social Care **05830 - 05871**

Mark Scheme for January 2018

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Annotations – These are the annotations to be used when marking Unit 4:

Annotation	Meaning
	Tick – correct answer
×	Cross – incorrect answer
+	Plus – use for positives
	Minus – use for negatives
L1	Level 1
L2	Level 2
L3	Level 3
BOD	Benefit of doubt (This does count as a mark – so do not 'tick' as well)
^	Omission mark
TV	Too vague
REP	Repeat
SEEN Or	Noted but no credit given

Q	uest	ion	Answer		Marks	Guidance	
1	(a)	a)				8 (8x1)	One mark for each correct answer. No other answers are acceptable. Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.
			Incus (anvil) Malleus (hammer) Semi-circular canals Stapes (stirrup)	C F (GIVEN) E			
1	(b)		Sound is channelled through the EXTE causes a vibration in the EARDRUM, The amplified as they pass along the three as in the middle ear. The vibration then encalled the COCHLEA in the inner ear. It cause electrical signals to be transmitten NERVE to the brain.	The vibrations are auditory ossicles or bone ters the coiled chamber Hairs in the organ of Cor	ti	One mark for each correct insertion Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.	

Q	uesti	on	Answer	Marks	Guidance
1	(c)		For balance, keeping upright, orientation, detecting changes of speed, acceleration/deceleration. Accept alternative wording.	1	1 mark for a correct answer Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.
2	(a)		Risk Factors or Causes: Females (at higher risk) excess alcohol Linked to low hormone levels (androgen or oestrogen Linked to post menopause Linked to anorexia Shortage of vitamin D Shortage of calcium in diet Family history Smoking Lack of exercise Age (older) Ethnicity Accept any other reasonable point	4 (4x1)	One mark for each correct point made. No other answers are acceptable. Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.
2	(b)	(i)	A transverse section of a bone	1	Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.

Q	uesti	ion	Answer	Marks	Guidance
2	(b)	(ii)	Less dense / cells more spaced out /less well-structured/more porous/ more holes or words to that effect	1	Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.
2	(c)		Possible methods of monitoring or treatment: bone density scan (DEXA) to monitor blood tests calcium and /or vitamin D supplements Carry out load-bearing exercise HRT for post-menopausal women finding a fracture of an unusual bone such as the wrist / shoulder/ hip/ vertebrae taking bisphosphonates (accept biphosphates) medication for strengthening bones physiotherapy The points below (and others) relate to initial diagnosis but are acceptable answers finding a fracture following a minor incident e.g a sneeze noticing slow healing after fracture asking about pain after an initial fracture	3 (3x1)	1 mark for each monitoring or treatment (3 required) Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.

Question	Answer/Indicative Content	Marks	Guidance			
Question		IVIAINS	Content	Levels of response		
2 (d)*	 Impact of osteoporosis on daily life: tired – unable to sleep properly due to pain poor mobility due to pain caused by moving may develop stooped posture which causes discomfort frightened to go out for fear of falling and breaking a bone reducing tripping hazards unable (unwilling to continue with strenuous exercise/ games etc. for fear) may cause social isolation due to worry about falls attending regular medical appointments Accept other appropriate impacts Accept limitations to daily activities such as shopping/driving only if linked to Severity. 	5	This is a levels of response question – marks are awarded on the quality of the response given. The focus of the question is explanation. Annotation: The number of ticks will not necessarily correspond to the marks awarded. Level 2 – checklist detailed-explanation logically structured factually accurate correct use of terminology QWC – high Level 1 – checklist limited / basic explanation limited use of terminology limited use of terminology alignment information limited use of terminology alignment information limited use of terminology alignment information limited use of terminology	Answers provide a developed explanation of impact on daily life using accurate terminology and following a logical sequence. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling. Level 1 [1–3 marks] Answers provide limited explanation. May be a description / identification only. Limited use of appropriate terminology. Sentences and paragraphs may not always be relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like. O marks – response not worthy of credit.		

Question	Answer/Indicative Content	Marks	Guidance				
Question		Warks	Content	Levels of response			
2 (e)*	Causes Bleeding / haemmorragic stroke Blood clot Around or in the brain Puts pressure on (various parts of) brain Risk factors such as coronary heart disease, stress, high blood pressure, high fat diet, high sugar diet, excess alcohol, obesity Effects Slurred speech Face may droop at one side Loss of motor control – inability to lift arms or hold things Limited / loss of mobility Side of body affected will be opposite to the side of brain affected Effects depend on which part of brain affected Accept any correct answer	10	This is a levels of response question – marks are awarded on the quality of the response given. The focus of the question is explanation. Annotation: The number of ticks will not necessarily correspond to the marks awarded. Level 3 – checklist detailed-description logically structured factually accurate correct use of terminology both causes and effects QWC – high Level 2 – checklist sound-explanation logically structured factually accurate some correct terminology QWC – medium Submax 5 if only one of causes or effects is covered Level 1 – checklist limited / basic description limited use of terminology list like / muddled QWC – mid – low	Level 3 [8 – 10 marks] Answers provide a developed description covering both causes and effects following a logical sequence. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There will be few if any errors of grammar, punctuation and spelling. Level 2 [5 – 7 marks] Answers provide a clear explanation of causes and effects of stroke. Sentences and paragraphs are largely relevant with some appropriate terminology. There may be occasional errors of grammar, punctuation and spelling. Level 1 [1–4 marks] Answers provide limited description. May be a list of symptoms (FAST). Limited use of appropriate terminology. Sentences and paragraphs may not always be relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like. O marks – response not worthy of credit SEEN for a zero mark response.			

Q	uesti	on	Ans	swer	Marks	Guidance
3	(a)	(i)	Urea		1	No other answer is acceptable. Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.
3	(a)	(ii)	Liver		1	No other answers are acceptable Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.
3	(a)	(iii)	Deamination		1	No other answer is acceptable Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.
3	(b)		Carries out ultrafiltration of the blood Establishes a salt gradient to draw water out of the filtrate Selective reabsorption occurs	PART OF KIDNEY NEPHRON Glomerulus Loop of Henle Convoluted tubule Collecting duct	4 (4x1)	Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.

Question	Answer/Indicative content	Marks	Guidance				
Question			Content	Levels of response			
3 (c)*	Possible treatments for nephrotic syndrome: • Steroids – reduce immune response – reduce inflammation. • Diuretics – reduce water retention due to leakage of fluid tissue into body tissues (oedema). • ACE inhibitors – reduce high blood pressure caused by fluid imbalance. • Immunosuppressant drugs – reduce immune response • Kidney transplant – brief explanation of technique, matching, donor availability, use of anti-rejection drugs	6	This is a levels of response question – marks are awarded on the quality of the response given. The focus of the question is explanation. Annotation: The number of ticks will not necessarily correspond to the marks awarded. Level 2 – checklist • detailed explanation • two or more treatments – related to nephrotic syndrome • logically structured • factually accurate • correct use of terminology • QWC – high Level 1 – checklist • limited / basic explanation • at least one treatment – related to nephrotic syndrome • information may not be relevant to respiratory health/CF • limited use of terminology • list like / muddled • QWC – mid – low	Answers provide a detailed explanation of two or more treatments with accurate use of terminology and that follows a logical sequence. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling. Level 1 [1–3 marks] Answers provide a limited explanation of at least one treatment. May be a description / identification only. Use of appropriate terminology may be limited. Sentences and paragraphs are not always relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like. O marks – response not worthy of credit.			

O	An averaglia di activa a autorit	Marks	Guidance				
Question	Answer/Indicative content		Content	Levels of response			
4 (a)*	Bile released from gall bladder / neutralises acidic chyme to provide optimum conditions for intestinal enzymes, all of which require alkaline conditions. Pancreas releases protease(trypsin), lipase and carbohydrase enzymes (amylase/sucrose/maltase) so all three food groups broken down Wall of small intestine also produces protease (peptidase) and carbohydrase Fats broken down to fatty acids and glycerol Protein broken down to polypeptides then to amino acids Complex carbohydrates broken down to simple sugars Emulsification of fats Neutralisation of acidic environment by alkaline component of pancreatic juice.	6	This is a levels of response question – marks are awarded on the quality of the response given. Annotation: The number of ticks will not necessarily correspond to the marks awarded. Level 2 – checklist detailed description of digestion in the small intestine well-developed, clear and logically structured Some mention of specific enzyme type or substrate required factually accurate QWC – high Level 1 – checklist limited / basic description may include correct facts in wrong order limited structure may be list like / muddled QWC – mid – low	Level 2 [4–6 marks] Answers provide a detailed description using accurate terminology and following a logical sequence. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling. Level 1 [1–3 marks] Answers provide a limited description in a limited manner. Likely to be a description /identification only. Their use of appropriate terminology will be limited. Sentences and paragraphs are not always relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like. O marks – response not worthy of credit.			

Question	Answer/Indicative content	Anguar/Indicative content	Marks	Guidan	ice
Question		IVIAINS	Content	Levels of response	
4 (b)*		Reducing fat intake – to reduce gall bladder activity – relatively easy (in theory) – considered largely ineffective. Medication to dissolve stones if not Calcium ones – takes a long time (2 years on average) – no additional interventions (surgery) so no recovery time etc. rarely used as not considered effective. Lithotripsy – uses sound waves to break stones into smaller pieces – non-invasive – can still be pain passing the fragments – not available in many centres. Laparoscopic cholecystectomy – 3 small incisions (1 in navel & 2 small other in abdomen – general anaesthetic but recovery time quite short – gall bladder also removed so no recurrence – may not be possible if patient is very overweight. Single incision keyhole surgery – only 1 scar – relatively new so uncertainties about its success. Open surgery - used where keyhole surgery is impossible – larger scar – much longer healing time. ERCP – endoscope through mouth & stomach to opening of bile duct – opening is widened and a stent may be inserted to keep duct open – sedation only – less invasive – technique is unpleasant for some.	8	This is a levels of response question – marks are awarded on the quality of the response given. The focus of the question is evaluation. Annotation: The number of ticks will not necessarily correspond to the marks awarded. Level 3 – checklist At least two treatments fully detailed evaluation both positives and negatives well-developed, clear and logically structured factually accurate & relevant correct use of terminology QWC – high Level 2 – checklist one or two treatments some evaluation at least one positive & negative may lack clarity mostly factually accurate some relevant information QWC – mid Level 1 – checklist basic likely to identify treatments with little or no evaluation or description of treatments information may not be relevant limited structure – list like or muddled	Answers provide a detailed evaluation of at least two treatments using accurate terminology and following a logical sequence. Both positives and negatives will be given. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling. Level 2 [4-6 marks] Answers provide a sound evaluation of two treatments that includes some accurate terminology. At least one positive and one negative will be given. Sentences and paragraphs are generally relevant but may have minor inaccuracies or lack clarity and depth of understanding. There may be some errors of grammar, punctuation and spelling. Sub—max of 4 – if only one treatment evaluated or if only positives or negatives given. Level 1 [1–3 marks] Answers provide a limited evaluation of treatments. Use of appropriate terminology will be limited. Sentences and paragraphs are not always relevant, with the

Question	Answer/Indicative content Ma	Marks	Guidance			
Questioi	Answer/indicative content	IVIAINS	Content	Levels of response		
			 QWC – low Marking annotation: Use for positive points Use for negative points 	material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like. 0 marks – response not worthy of credit.		
4 (c)*	 Examples of effects: checking blood sugar levels – nuisance – problem if forget kit insulin injections – has to be stored at specific temperature – may be problem if out of house for long periods varying injection site – to prevent development of lumps under skin needing to be aware of early signs of hypoglycaemia exercise important – too heavy exercise may throw sugar levels out of balance retinopathy risk of infection/loss of sensitivity/amputations strokes kidney damage Analysis of effects: constraints on social activities daily routine needs to be planned around management of condition 	10	This is a levels of response question – marks are awarded on the quality of the response given. The focus of the question is analysis. Level 3 – checklist At least two effects detailed analysis well-developed, clear and logically structured factually accurate & relevant correct use of terminology QWC – high Level 2 – checklist Sound analysis one or two effects logically structured factually accurate correct use of terminology QWC – high	Level 3 [8 - 10 marks] Answers provide a detailed analysis of at least two effects on daily activities that includes accurate terminology and follows a logical sequence. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling. Level 2 [5 - 7 marks] Answers provide a sound analysis of one or two effects on daily activities that includes accurate terminology and follows a logical sequence. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling. Sub-max of 5 if only one effect		

Question	Answer/Indicative content	Marks	Guidance		
Question	Answer/indicative content	IVIAI NS	Content	Levels of response	
	 need to plan events e.g. day out, going on holiday carefully – being spontaneous/acting on impulse may not be possible social barriers e.g. embarrassment, lack of understanding of others emotional barriers e.g. anxiety about effects of condition, problems withdrawal from social activities eg isolation, loss of friends limitations on daily activities linked to severe consequences of diabetes Accept any appropriate well-reasoned point. 		 Level 1 – checklist likely to identify effects with little or no explanation limited relevant information limited use of terminology list like / muddled Annotation: The number of ticks will not necessarily correspond to the marks awarded. SEEN for a zero mark response 	analysed. Level 1 [1–4 marks] Answers provide a description / identification of effects with limited analysis. Use of appropriate terminology will be limited. Sentences and paragraphs are not always relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like. O marks – response not worthy of credit.	

Q	Question		Any two points • shape (bi-concave disc/donut) – increases surface area for uptake of oxygen • no nucleus – leaves more room (for haemoglobin) so able to transport more oxygen • full of haemoglobin –combines with oxygen • small/flexible – can get into narrow capillaries so near to body tissues • round – pass easily and do not get caught up in thin vessels			Guidance	
5	5 (a) (i)					2 marks for each explanation (two required): One mark: identification of structure Two marks: explanation of structure's effect Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.	
5	(a)	(ii)	Brings about clotting after an injury Carries dissolved food molecules around the body	Component of blood Platelets Plasma Lymphocytes	3 (3 x 1)	No other answers are acceptable Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.	

Q	Question		Answer		Guidance	
5	(b)		Any three points: Question could be interpreted in two ways: Marks can be awarded if the candidate refers to blood as a medium: the role of blood in removing heat from metabolising cells to remove the risk of enzyme denaturation distributing heat around the body as a result of homeostasis involving the hypothalamus. Candidates may interpret 'blood' as meaning the role of the blood system in which the following points can be awarded. when hot blood vessels in the skin dilate (widen) more blood near skin surface (looks red) allows blood to be cooled (as sweat evaporates from surface) when cold vessels near skin surface contract less blood near skin surface (look pale) preventing heat loss	3 (3x1)	Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.	
5	(c)		 Two explanations required. Two marks for each explanation. Arteries have thicker / more muscular walls than veins – needed to withstand higher pressure. Veins have valves while arteries do not – lower pressure in veins requires safety mechanism to prevent backflow. Candidates may refer to differences in lumen size –arteries small/narrow, veins wide/large. Only award a mark for each as a structural point. Any linked reference to blood pressure is not an explanation of lumen size. 	4 (2x2)	mark for a structural difference marks for an appropriate explanation Annotation: The number of ticks must match the number of marks awarded. For an incorrect answer use the cross.	

	Question		Anomor	Marks	Guidance		
			Answer		Content	Levels of response	
5	(d)	*	 Gas exchange occurs in the alveoli (air sacs) air entering the alveolus has relatively high oxygen concentration oxygen dissolves in thin moist layer diffuses quickly across wall of alveolus (thin) and into capillary (from pulmonary artery) movement due to diffusion gradient oxygen attaches to haemoglobin in RBC blood leaving lungs in the pulmonary vein has high oxygen and low carbon dioxide levels No marks should be awarded for references to carbon dioxide movement as question did not ask for this. The question specifies oxygen uptake only. Details of the mechanism of breathing can be given some credit but are not sufficient to raise the answer to level 2 	6	This is a levels of response question – marks are awarded on the quality of the response given. The focus of the question is description). Annotation: The number of ticks will not necessarily correspond to the marks awarded. Level 2 – checklist Detailed description Correct use of terminology factually accurate some relevant information QWC – sound Level 1 – checklist basic description information may not be relevant limited structure – list like or muddled QWC – low	Level 2 [4-6 marks] Answers provide a detailed description of how oxygen is added to blood in the lungs with accurate use of terminology. Sentences and paragraphs are largely relevant. There may be some errors of grammar, punctuation and spelling. Level 1 [1–3 marks] Candidates' will give a description of the oxygenation of blood in the lungs. Their use of appropriate terminology will be limited. Sentences and paragraphs are not always relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like. O marks – response not worthy of credit. SEEN for a zero mark response	

Question		ion	Answer	Marks	Guidance		
	Question				Content	Levels of response	
5	(e)	(i)	Malfunction:AsthmaEmphysemaCystic Fibrosis	1	One mark for identification of malfunction		
5	(e)	*(ii)	 Preventative inhalers – used regularly – corticosteroids – reduce swelling and inflammation. Identification of triggers – if caused by allergens may use de-sensitising injections. Reliever inhalers – muscle relaxants for immediate relief of symptoms. Both types of inhaler may be used with spacer device – gets drugs deeper. Nebulisers may be required if constriction too great – gets drugs deeper into lungs. Emphysema Inhalers and/or nebulisers as in asthma. Stopping smoking. Pulmonary rehabilitation (special programme of exercise and education). Long term oxygen therapy. Ambulatory oxygen therapy. 	5	This is a levels of response question – marks are awarded on the quality of the response given. The focus of the question is description. Annotation: The number of ticks will not necessarily correspond to the marks awarded. Level 2 – checklist detailed description correct for dysfunction chosen well-developed, clear and logically structured factually accurate correct use of terminology QWC – high – medium Level 1 – checklist limited / basic description information may not be relevant limited structure may be list like / muddled minimal or no terminology QWC – low – medium	Level 2 [4–5 marks] Answers provide a detailed description of how the named disorder could be treated. Accurate terminology will be used and answers will follow a logical sequence. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling. Level 1 [1–3 marks] Answers provide a basic description. Use of appropriate terminology will be limited. Sentences and paragraphs are not always relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like. O marks – response not worthy of credit.	

Question	Answer	Marks	Guidance		
Question			Content	Levels of response	
	 Cystic Fibrosis Steroid treatments to reduce symptoms. Physiotherapy Oxygen therapy Lung transplant Antibiotics to treat infections. Regular monitoring – use of peak flow meter. Diet – well balanced; – to promote maintenance of healthy weight. Dietary supplements. Avoidance of pollution. 			for a zero mark response	

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