



**NCFE CACHE Technical Level 3
Extended Diploma in Health and Social Care
(601/8435/8)**

January 2022

Unit title: DM3.1 Anatomy and physiology for health and social care

Assessment code: HSC/SAE

Paper number: P001380

Mark Scheme

v3 Pre-standardisation

This mark scheme has been written by the Assessment Writer and refined, alongside the relevant questions, by a panel of subject experts through the external assessment writing process and at standardisation meetings.

The purpose of this mark scheme is to give you:

- examples and criteria of the types of response expected from a learner
- information on how individual marks are to be awarded
- the allocated assessment objective(s) and total mark for each question.

Marking guidelines

General guidelines

You must apply the following marking guidelines to all marking undertaken throughout the marking period. This is to ensure fairness to all learners, who must receive the same treatment. You must mark the first learner in exactly the same way as you mark the last.

- The mark scheme must be referred to throughout the marking period and applied consistently. Do not change your approach to marking once you have been standardised.
- Reward learners positively giving credit for what they have shown, rather than what they might have omitted.
- Utilise the whole mark range and always award full marks when the response merits them.
- Be prepared to award zero marks if the learner's response has no creditworthy material.
- Do not credit irrelevant material that does not answer the question, no matter how impressive the response might be.
- The marks awarded for each response should be clearly and legibly recorded in the grid on the front of the question paper.
- If you are in any doubt about the application of the mark scheme, you must consult with your Team Leader or the Chief Examiner.

Guidelines for using extended response marking grids

Extended response marking grids have been designed to award a learner's response holistically and should follow a best-fit approach. The grids are broken down into levels, with each level having an associated descriptor indicating the performance at that level. You should determine the level before determining the mark.

When determining a level, you should use a bottom-up approach. If the response meets all the descriptors in the lowest level, you should move to the next one, and so on, until the response matches the level descriptor. Remember to look at the overall quality of the response and reward learners positively, rather than focussing on small omissions. If the response covers aspects at different levels, you should use a best-fit approach at this stage, and use the available marks within the level to credit the response appropriately.

When determining a mark, your decision should be based on the quality of the response in relation to the descriptors. Standardisation materials, marked by the Chief Examiner, will help you with determining a mark. You will be able to use exemplar learner responses to compare to live responses, to decide if it is the same, better or worse.

You are reminded that the indicative content provided under the marking grid is there as a guide, and therefore you must credit any other suitable responses a learner may produce. It is not a requirement either, that learners must cover all of the indicative content to be awarded full marks.

Assessment objectives

This unit requires learners to:

A01	Recall of knowledge and understanding
A02	Application of knowledge and understanding
A03	Analysis to demonstrate knowledge of concepts and theories

Qu	Mark scheme	Total marks						
1 (a)	<p>Name the piece of equipment used to measure body temperature.</p> <p>Award one (1) mark for:</p> <ul style="list-style-type: none"> • Thermometer (1). 	<p>1</p> <p>AO1=1</p>						
1 (b)	<p>Hair helps to maintain body temperature.</p> <p>Give one (1) way hair helps to maintain body temperature and explain this process.</p> <p>Award one (1) mark for correct identification and up to two (2) marks for an appropriate explanation.</p> <ul style="list-style-type: none"> • Hairs lie flat (1) – When body is warm (1), releases trapped air from the skin (1), allows sweat to evaporate (1), cools skin (1). • Hairs erect (1) – When body is cold (1), traps air next to skin (1), creates insulation barrier (1), maintains body heat (1). <p>Accept other suitable responses.</p>	<p>3</p> <p>AO1=1</p> <p>AO2=2</p>						
1 (c)	<p>Maintaining body temperature is a homeostatic mechanism.</p> <p>Discuss the relationship between the endocrine system and the nervous system in gaining homeostatic control.</p> <table border="1" data-bbox="295 1400 1220 2060"> <thead> <tr> <th data-bbox="295 1400 406 1444">Level</th> <th data-bbox="406 1400 542 1444">Marks</th> <th data-bbox="542 1400 1220 1444">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="295 1444 406 2060">3</td> <td data-bbox="406 1444 542 2060">9–12</td> <td data-bbox="542 1444 1220 2060"> <p>A wide range of relevant knowledge and understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control is shown, which is accurate and detailed.</p> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control.</p> <p>Analysis to demonstrate understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control is detailed and highly effective, with reasoned judgements related to the</p> </td> </tr> </tbody> </table>	Level	Marks	Description	3	9–12	<p>A wide range of relevant knowledge and understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control is shown, which is accurate and detailed.</p> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control.</p> <p>Analysis to demonstrate understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control is detailed and highly effective, with reasoned judgements related to the</p>	<p>12</p> <p>AO1=2</p> <p>AO2=5</p> <p>AO3=5</p>
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			<p>maintenance of body temperature made. Clear links are made.</p>
	2	5–8	<p>A wide range of relevant knowledge and understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control is shown, but may be lacking in sufficient detail, with a few errors.</p> <p>Application of knowledge is mostly appropriate, showing some clear understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control. There may be a few errors.</p> <p>Analysis to demonstrate understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control is effective and mostly relevant with simplistic judgments related to the maintenance of body temperature made. Some clear links are made.</p>
	1	1–4	<p>A limited range of relevant knowledge and understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control is shown, but is often fragmented.</p> <p>Application of knowledge is limited and may show a lack of understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of the relationship between the endocrine and the nervous system in gaining homeostatic control lacks detail and may have limited effectiveness and relevance to the maintenance of body temperature. Links may be made, but are often inappropriate.</p>
		0	No creditworthy material
<p><u>Indicative content</u> AO1</p> <ul style="list-style-type: none"> The hypothalamus is the link between the endocrine and nervous systems. 			

	<ul style="list-style-type: none"> • The hypothalamus produces releasing and inhibiting hormones, which stop and start the production of other hormones throughout the body. • The pituitary gland is often called the ‘master gland’ because its hormones control other parts of the endocrine system. <p>AO2</p> <ul style="list-style-type: none"> • The hypothalamus is a significant gland in the endocrine system. • The hypothalamus is closely connected to pituitary gland function. • The hypothalamus secretes neurohormones. Neurohormones start and stop the secretion of pituitary hormones. • The hormones released by the pituitary gland regulate the hormone secretion of other endocrine glands. • Other significant glands include the thyroid, parathyroid, adrenal, pineal body, the ovaries, the testes and the pancreas. <p>AO3</p> <ul style="list-style-type: none"> • Negative feedback is the primary mechanism in the regulation of an internal environment. • Negative feedback occurs when the response to a stimulus reduces the original stimulus. • Positive feedback is the mechanism involved when the response to a stimulus causes an increase to the original stimulus. • The four main homeostatic mechanisms are thermoregulation, osmoregulation, glucoregulation and maintenance of blood pressure. <p>Accept other suitable responses.</p>	
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1 (d)	<p>In the nervous system, impulses pass along the membrane of a nerve cell.</p> <p>Identify this process and explain its function.</p> <p>Award one (1) mark for correct identification.</p> <ul style="list-style-type: none"> • Action potential (1). <p>Award up to three (3) marks for an accurate explanation.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">3 marks</td> <td>The explanation is appropriate and accurate and shows clear understanding of the procedures.</td> </tr> <tr> <td>2 marks</td> <td>The explanation is mostly appropriate showing some understanding of the procedure.</td> </tr> <tr> <td>1 mark</td> <td>The explanation is limited and lacks understanding of the procedure.</td> </tr> <tr> <td>0 marks</td> <td>No creditworthy material.</td> </tr> </table> <ul style="list-style-type: none"> • Plays a central role in cell-to-cell communication 	3 marks	The explanation is appropriate and accurate and shows clear understanding of the procedures.	2 marks	The explanation is mostly appropriate showing some understanding of the procedure.	1 mark	The explanation is limited and lacks understanding of the procedure.	0 marks	No creditworthy material.	<p>4</p> <p>AO1=1</p> <p>AO3=3</p>
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	<ul style="list-style-type: none"> • The propagation of signals along the neuron's axon toward synaptic cleft • Concentration gradients are key behind how action potentials work • Allow more sodium ions (Na⁺) outside than inside the neuron • Allow more potassium ions (K⁺) inside than outside the neuron • Channels are 'voltage-gated' because they are opened and closed depending on the voltage difference across the cell membrane. <p>Accept other suitable responses.</p>	
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2 (a)	<p>Discuss the structure and function of the appendicular skeletal system.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 10%;">Level</th> <th style="width: 10%;">Marks</th> <th style="width: 80%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">5–6</td> <td> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the structure and function of the appendicular skeletal system.</p> <p>Analysis to demonstrate understanding of the structure and function of the appendicular skeletal system is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p> </td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">3–4</td> <td> <p>Application of knowledge is mostly appropriate, showing some clear understanding of the structure and function of the appendicular skeletal system. There may be a few errors.</p> <p>Analysis to demonstrate understanding of the structure and function of the appendicular skeletal system is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p> </td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1–2</td> <td> <p>Application of knowledge is limited and may show a lack of understanding of the structure and function of the appendicular skeletal system. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of the structure and function of the appendicular skeletal system lacks detail and may have limited effectiveness and relevance. Links may be made, but are often inappropriate.</p> </td> </tr> <tr> <td></td> <td style="text-align: center;">0</td> <td>No creditworthy material.</td> </tr> </tbody> </table>	Level	Marks	Description	3	5–6	<p>Application of knowledge is appropriate and accurate and shows clear understanding of the structure and function of the appendicular skeletal system.</p> <p>Analysis to demonstrate understanding of the structure and function of the appendicular skeletal system is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p>	2	3–4	<p>Application of knowledge is mostly appropriate, showing some clear understanding of the structure and function of the appendicular skeletal system. There may be a few errors.</p> <p>Analysis to demonstrate understanding of the structure and function of the appendicular skeletal system is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p>	1	1–2	<p>Application of knowledge is limited and may show a lack of understanding of the structure and function of the appendicular skeletal system. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of the structure and function of the appendicular skeletal system lacks detail and may have limited effectiveness and relevance. Links may be made, but are often inappropriate.</p>		0	No creditworthy material.	<p>6</p> <p>AO2=3</p> <p>AO3=3</p>
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	<p><u>Indicative content</u></p> <p>AO2</p> <ul style="list-style-type: none"> • The appendicular skeleton consists of the bones that support the appendages. • This includes the bones within the limbs, as well as the pectoral and pelvic girdle. • The appendicular skeleton comprises 126 of the 206 bones in the human body. • These bones are in the shoulder girdle, arms and hands, pelvic girdle and legs and feet. <p>AO3</p> <ul style="list-style-type: none"> • The bones of the upper limbs allow for reach and grasp. • The bones of the lower limbs allow for locomotion. • The bones of the shoulder girdle attach the upper limbs to the body. • The bones of the pelvic girdle attach the lower limbs to the body. <p>Accept other suitable responses.</p>	
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2 (b)	<p>Discuss how the structure of bone assists its function.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 15%;">Level</th> <th style="width: 15%;">Marks</th> <th style="width: 70%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">5–6</td> <td> <p>Application of knowledge is appropriate and accurate and shows clear understanding of how the structure of bone assists function.</p> <p>Analysis to demonstrate understanding of how the structure of bone assists function is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p> </td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">3–4</td> <td> <p>Application of knowledge is mostly appropriate, showing some clear understanding of how the structure of bones assists function. There may be a few errors.</p> <p>Analysis to demonstrate understanding of how the structure of bone assists function is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p> </td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1–2</td> <td> <p>Application of knowledge is limited and may show a lack of understanding of how the structure of bone assists function. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of how the structure of bone assists function</p> </td> </tr> </tbody> </table>	Level	Marks	Description	3	5–6	<p>Application of knowledge is appropriate and accurate and shows clear understanding of how the structure of bone assists function.</p> <p>Analysis to demonstrate understanding of how the structure of bone assists function is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p>	2	3–4	<p>Application of knowledge is mostly appropriate, showing some clear understanding of how the structure of bones assists function. There may be a few errors.</p> <p>Analysis to demonstrate understanding of how the structure of bone assists function is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p>	1	1–2	<p>Application of knowledge is limited and may show a lack of understanding of how the structure of bone assists function. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of how the structure of bone assists function</p>	<p>6</p> <p>AO2=3</p> <p>AO3=3</p>
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<p><u>Indicative content</u></p> <p>AO2</p> <ul style="list-style-type: none"> • Bones are composed of two types of tissue. • Compact (cortical) bone: a hard outer layer that is dense, strong, and durable. • Cancellous (trabecular or spongy) bone: this consists of a network of trabeculae or rod-like structures. • Bones provide a frame to support the body. • Some bones protect the body's internal organs. <p>AO3</p> <ul style="list-style-type: none"> • Bone also contains osteoblasts and osteocytes, osteoclasts, a mix of collagen and other proteins, inorganic mineral salts, nerves and blood vessels, bone marrow and cartilage. • Muscles, tendons, and ligaments attach to bones. • Cancellous bone produces red blood cells, platelets, and white blood cells. • Other functions include: storing minerals, growth factors and fat, pH balance, detoxification, assisting endocrine function and maintaining calcium balance. <p>Accept other suitable responses.</p>			

2 (c)	<p>The skeletal and muscular systems work together.</p> <p>Identify and describe the tissue that connects bone to muscle.</p> <p>Award one (1) mark for correct identification.</p> <ul style="list-style-type: none"> • Tendon (1). <p>Award up to three (3) marks for a description.</p> <ul style="list-style-type: none"> • A strong fibrous cord (1) • Flexible but inelastic (1) • Made of collagen (1) • Modulates forces during locomotion (1) • Provides additional stability to joints (1). <p>Accept other suitable responses.</p>	<p>4</p> <p>AO1=1</p> <p>AO2=3</p>
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2 (d)	<p>Actin is one of two proteins involved in muscle contraction.</p> <p>Identify the other protein involved in muscle contraction and explain the structure and function of this other protein.</p>	<p>4</p> <p>AO1=1</p>
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	<p>Award one (1) mark for correct identification.</p> <ul style="list-style-type: none"> • Myosin. <p>Award up to three (3) marks for an accurate explanation.</p> <ul style="list-style-type: none"> • Myosin is a thick filament (1) • Converts chemical energy in the form of ATP to mechanical energy (1) • Generates the force in a muscle contraction (1) • Consists of a head and a tail region (1) • Interacts with actin (thin filament) to produce muscle contractions (1). <p>Accept other suitable responses.</p>	<p>AO3=3</p>
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<p>3 (a)</p>	<p>Identify three (3) types of blood vessel.</p> <p>Award one (1) mark for each correct identification up to a total of three (3) marks.</p> <ul style="list-style-type: none"> • Arteries (1) • Arterioles (1) • Veins (1) • Venules (1) • Capillaries (1). 	<p>3</p> <p>AO1=3</p>
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<p>3 (b)</p>	<p>Analyse how the structure of the heart supports blood flow.</p> <table border="1" data-bbox="293 1245 1219 1832"> <thead> <tr> <th data-bbox="293 1245 408 1285">Level</th> <th data-bbox="408 1245 544 1285">Marks</th> <th data-bbox="544 1245 1219 1285">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="293 1285 408 1832">3</td> <td data-bbox="408 1285 544 1832">7–9</td> <td data-bbox="544 1285 1219 1832"> <p>A range of knowledge and understanding of how the structure of the heart supports blood flow is shown, which is accurate and detailed.</p> <p>Application of knowledge is appropriate and accurate and shows clear understanding of how the structure of the heart supports blood flow.</p> <p>Analysis to demonstrate understanding of how the structure of the heart supports blood flow is detailed and highly effective, with reasoned judgements made. Clear links are made.</p> </td> </tr> </tbody> </table>	Level	Marks	Description	3	7–9	<p>A range of knowledge and understanding of how the structure of the heart supports blood flow is shown, which is accurate and detailed.</p> <p>Application of knowledge is appropriate and accurate and shows clear understanding of how the structure of the heart supports blood flow.</p> <p>Analysis to demonstrate understanding of how the structure of the heart supports blood flow is detailed and highly effective, with reasoned judgements made. Clear links are made.</p>	<p>9</p> <p>AO1=1</p> <p>AO2=4</p> <p>AO3=4</p>
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2	4-6	<p>A range of relevant knowledge and understanding of how the structure of the heart supports blood flow is shown, but may be lacking in sufficient detail, with a few errors.</p> <p>Application of knowledge is mostly appropriate, showing some clear understanding of how the structure of the heart supports blood flow. There may be a few errors.</p> <p>Analysis to demonstrate understanding of how the structure of the heart supports blood flow is effective and mostly relevant with simplistic judgments made. Some clear links are made.</p>
1	1-3	<p>A limited range of relevant knowledge and understanding of how the structure of the heart supports blood flow is shown, but is often fragmented.</p> <p>Application of knowledge is limited and may show a lack of understanding of how the structure of the heart supports blood flow. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of how the structure of the heart supports blood flow lacks detail and may have limited effectiveness and relevance. Links may be made, but are often inappropriate.</p>
	0	No creditworthy material.

Indicative content

AO1

- All blood enters the right side of the heart through two veins: the superior vena cava and the inferior vena cava.
- Blood returns to the heart from the lungs by way of the pulmonary veins and goes into the left atrium.

AO2

- When the right atrium contracts, the blood goes through the tricuspid valve and into the right ventricle.
- When the right ventricle contracts, blood is pumped through the pulmonary valve into the pulmonary artery, and into the lungs where it picks up oxygen.
- When the left atrium contracts, blood travels through the mitral valve and into the left ventricle.

	<ul style="list-style-type: none"> • The left ventricle is a very important chamber that pumps blood through the aortic valve and into the aorta. • The aorta is the main artery of the body. It receives all the blood that the heart has pumped out and distributes it to the rest of the body. <p>AO3</p> <ul style="list-style-type: none"> • Blood leaves the superior vena cava and the inferior vena cava and enters the right atrium. • The superior vena cava collects blood from the upper half of the body. • The inferior vena cava collects blood from the lower half of the body. • The left ventricle has a thicker muscle than any other heart chamber because it must pump blood to the rest of the body against much higher pressure in the general circulation. • Valves prevent backflow of blood; heart is two pumps as lungs could not function with high pressure from the left side of heart. <p>Accept other suitable responses.</p>	
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<p>3 (c)</p>	<p>Blood is pumped to the alveoli in the lungs for gaseous exchange.</p> <p>Identify and explain the chemical process that enables gaseous exchange.</p> <p>Award one (1) mark for a correct identification.</p> <ul style="list-style-type: none"> • Diffusion (1) <p>Award up to three (3) marks for an explanation.</p> <ul style="list-style-type: none"> • Diffusion occurs from a high concentration to a low concentration (1) • The alveoli have a high concentration of oxygen (1) • Blood has a low concentration of oxygen (1) • Blood has a high concentration of carbon dioxide (1) • The alveoli have a low concentration of carbon dioxide (1). <p>Accept other suitable responses.</p>	<p>4</p> <p>AO1=1</p> <p>AO2=3</p>
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<p>3 (d)</p>	<p>Identify and discuss what ability an individual must have to enable them to give informed consent.</p> <p>Award one (1) mark for correct identification.</p> <ul style="list-style-type: none"> • Capacity (1). 	<p>4</p> <p>AO1=1</p> <p>AO3=3</p>
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	<p>Award up to three (3) marks for an accurate discussion.</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 15%;">3 marks</td> <td>The discussion is appropriate and accurate and shows clear understanding of the procedures.</td> </tr> <tr> <td>2 marks</td> <td>The discussion is mostly appropriate showing some understanding of the procedure.</td> </tr> <tr> <td>1 mark</td> <td>The discussion is limited and lacks understanding of the procedure.</td> </tr> <tr> <td>0 marks</td> <td>No creditworthy material</td> </tr> </table> <ul style="list-style-type: none"> • An individual is able to make their own decisions • Individual must understand information given to them • Individual must be able to retain that information long enough to be able to make the decision • Individual must be able to weigh up the information available • Individual must be able to communicate their decision. <p>Accept other suitable responses.</p>	3 marks	The discussion is appropriate and accurate and shows clear understanding of the procedures.	2 marks	The discussion is mostly appropriate showing some understanding of the procedure.	1 mark	The discussion is limited and lacks understanding of the procedure.	0 marks	No creditworthy material	
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4 (a)	<p>Identify and explain the physical process in digestion that helps with the passage of food through the digestive tract.</p> <p>Award one (1) mark for a correct identification.</p> <ul style="list-style-type: none"> • Peristalsis (1). <p>Award up to three (3) marks for an accurate explanation.</p> <ul style="list-style-type: none"> • Wave-like muscle contractions (1) • Commences in oesophagus when a bolus of food is swallowed (1) • Smooth muscle is responsible for peristalsis (1) • Peristalsis continues in the small intestine (1) • Peristalsis concludes in the large intestine (1). <p>Accept other suitable responses.</p>	<p>4</p> <p>AO1=1</p> <p>AO2=3</p>
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4 (b)	<p>Discuss the role of enzymes in chemical digestion.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 10%;">Level</th> <th style="width: 10%;">Marks</th> <th style="width: 80%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">5–6</td> <td> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the role of enzymes in chemical digestion.</p> <p>Analysis to demonstrate understanding of the role of enzymes in chemical digestion is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p> </td> </tr> </tbody> </table>	Level	Marks	Description	3	5–6	<p>Application of knowledge is appropriate and accurate and shows clear understanding of the role of enzymes in chemical digestion.</p> <p>Analysis to demonstrate understanding of the role of enzymes in chemical digestion is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p>	<p>6</p> <p>AO2=3</p> <p>AO3=3</p>
Level	Marks	Description						
3	5–6	<p>Application of knowledge is appropriate and accurate and shows clear understanding of the role of enzymes in chemical digestion.</p> <p>Analysis to demonstrate understanding of the role of enzymes in chemical digestion is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p>						

	2	3–4	<p>Application of knowledge is mostly appropriate, showing some clear understanding of the role of enzymes in chemical digestion. There may be a few errors.</p> <p>Analysis to demonstrate understanding of the role of enzymes in chemical digestion is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p>
	1	1–2	<p>Application of knowledge is limited and may show a lack of understanding of the role of enzymes in chemical digestion. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of the role of enzymes in chemical digestion lacks detail and may have limited effectiveness and relevance. Links may be made, but are often inappropriate.</p>
		0	No creditworthy material.

Indicative content

AO2

- Amylase is contained in saliva in the mouth.
- Amylase breaks down carbohydrates (starch) into glucose.
- Protease is released into the small intestine.
- Protease breaks down proteins into amino acids.
- Lipase breaks down fats into fatty acids.

AO3

- Amylase is produced in the pancreas.
- Protease is produced in the pancreas.
- Lipase is produced in the pancreas.
- Enzymes speed up chemical reaction to break down food, and allow intestines to digest nutrients.

Accept other suitable responses.

4 (c)	Discuss the function of both the liver and the gall bladder in digestion.		6 AO2=3 AO3=3
	Level	Marks	
	3	5–6	<p>Application of knowledge is appropriate and accurate and shows clear understanding of the function of the liver and gall bladder in digestion.</p> <p>Analysis to demonstrate understanding of the function of the liver and gall bladder in digestion is detailed and highly effective, with</p>

		clearly reasoned consequences. Clear links are made.
2	3–4	Application of knowledge is mostly appropriate, showing some clear understanding of the function of the liver and gall bladder in digestion. There may be a few errors. Analysis to demonstrate understanding of the function of the liver and gall bladder in digestion is effective and mostly relevant, with simplistic consequences. Some clear links are made.
1	1–2	Application of knowledge is limited and may show a lack of understanding of the function of the liver and gall bladder in digestion. There may be a number of errors. Analysis to demonstrate understanding of the function of the liver and gall bladder in digestion lacks detail and may have limited effectiveness and relevance. Links may be made, but are often inappropriate.
	0	No creditworthy material.

Indicative content

AO2

- The liver processes the nutrients absorbed from the small intestine.
- The liver produces bile.
- Bile helps the body absorb fat into the bloodstream.
- Bile breaks fats into smaller masses for easier digestion by the enzyme lipase.

AO3

- The liver transports bile to the gall bladder by peristalsis.
- The gall bladder is situated by the liver.
- The gall bladder holds bile produced in the liver until it is needed.
- Bile is secreted into the small intestine (duodenum) by the gall bladder.

Accept other suitable responses.

4 (d)	<p>Identify the organ that receives food from the oesophagus and explain the structure and function of this organ.</p> <p>Award one (1) mark for correct identification.</p> <ul style="list-style-type: none"> • Stomach (1). 	<p>4</p> <p>AO1=1</p> <p>AO2=3</p>
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	<p>Award up to three (3) marks for an accurate explanation.</p> <ul style="list-style-type: none"> • Located on the left side of the upper abdomen (1) • Food enters the stomach through the lower oesophageal sphincter (1) • Secretes acid and enzymes that break down food (1) • The stomach muscles periodically contracts, this churns food and enhances digestion (1) • The pyloric sphincter is a muscular valve that opens to allow food to pass from the stomach to the small intestine (1). <p>Accept other suitable responses.</p>	
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5 (a)	<p>Analyse how the structure of skin supports body function.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 10%;">Level</th> <th style="width: 10%;">Marks</th> <th style="width: 80%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">7–9</td> <td> <p>A range of knowledge and understanding of how the structure of skin supports body function is shown, which is accurate and detailed.</p> <p>Application of knowledge is appropriate and accurate and shows clear understanding of how the structure of skin supports body function.</p> <p>Analysis to demonstrate understanding of how the structure of skin supports body function is detailed and highly effective, with reasoned judgements made. Clear links are made.</p> </td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">4-6</td> <td> <p>A range of relevant knowledge and understanding of how the structure of skin supports body function is shown, but may be lacking in sufficient detail, with a few errors.</p> <p>Application of knowledge is mostly appropriate, showing some clear understanding of how the structure of skin supports body function. There may be a few errors.</p> <p>Analysis to demonstrate understanding of how the structure of skin supports body function is effective and mostly relevant with simplistic judgments made. Some clear links are made.</p> </td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1–3</td> <td> <p>A limited range of relevant knowledge and understanding of how the structure of skin supports body function is shown, but is often fragmented.</p> </td> </tr> </tbody> </table>	Level	Marks	Description	3	7–9	<p>A range of knowledge and understanding of how the structure of skin supports body function is shown, which is accurate and detailed.</p> <p>Application of knowledge is appropriate and accurate and shows clear understanding of how the structure of skin supports body function.</p> <p>Analysis to demonstrate understanding of how the structure of skin supports body function is detailed and highly effective, with reasoned judgements made. Clear links are made.</p>	2	4-6	<p>A range of relevant knowledge and understanding of how the structure of skin supports body function is shown, but may be lacking in sufficient detail, with a few errors.</p> <p>Application of knowledge is mostly appropriate, showing some clear understanding of how the structure of skin supports body function. There may be a few errors.</p> <p>Analysis to demonstrate understanding of how the structure of skin supports body function is effective and mostly relevant with simplistic judgments made. Some clear links are made.</p>	1	1–3	<p>A limited range of relevant knowledge and understanding of how the structure of skin supports body function is shown, but is often fragmented.</p>	<p>9</p> <p>AO1=1</p> <p>AO2=4</p> <p>AO3=4</p>
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	0	No creditworthy material	
<p><u>Indicative content</u></p> <p>AO1</p> <ul style="list-style-type: none"> • Skin has three layers. • These are epidermis, dermis and subcutaneous. <p>AO2</p> <ul style="list-style-type: none"> • General functions of the skin: <ul style="list-style-type: none"> – protection – temperature regulation – sensation – excretion – vitamin D synthesis • Epidermis: <ul style="list-style-type: none"> – outer layer of skin – the epidermis primarily consists of keratinocytes – provides a barrier to infection from environmental pathogens • Dermis: <ul style="list-style-type: none"> – layer of skin between the epidermis and subcutaneous tissues – consists of irregular dense connective tissue – cushions the body from impacts • Subcutaneous: <ul style="list-style-type: none"> – the lowermost layer of the integumentary system it is used mainly for fat storage – subcutaneous fat is the most widely distributed layer of subcutaneous tissue . <p>AO3</p> <ul style="list-style-type: none"> • Epidermis: <ul style="list-style-type: none"> – the epidermis itself has no blood supply and is nourished almost exclusively by diffused oxygen from the surrounding air • All layers of the epidermis contain mechanisms for regulating water and sodium levels • Dermis: <ul style="list-style-type: none"> – it contains mechanoreceptors that provide the sense of touch – it contains thermoreceptors that provide the sense of heat 			

	<ul style="list-style-type: none"> - it also contains hair follicles, sweat glands, sebaceous glands (oil glands), apocrine glands, lymphatic vessels, nerves and blood vessels • Subcutaneous: <ul style="list-style-type: none"> - fibroblasts, adipose cells and macrophages are found in the hypodermis - injection into the subcutaneous tissue is a route of administration used for drugs such as insulin. <p>Accept other suitable responses.</p>	
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<p>5 (b)</p>	<p>Identify and explain the mechanism activated by stress that can affect body temperature.</p> <p>Award one (1) mark for correct identification.</p> <ul style="list-style-type: none"> • Fight or flight (1). <p>Award up to three (3) marks for an accurate explanation:</p> <ul style="list-style-type: none"> • A physiological response that occurs as a reaction to a perceived threat, attack or harmful event (1) • The autonomic nervous system is a control system that instigates this (1) • The process is actuated by an increase in adrenaline levels (1) • Increased blood flow to the muscles (1) • Increased blood pressure, heart rate, blood sugars, and fats in order to supply the body with extra energy (1) • The blood clotting function of the body speeds up (1) • Increased muscle tension in order to provide the body with extra speed and strength (1). <p>Accept other suitable responses.</p>	<p>4</p> <p>AO1=1</p> <p>AO2=3</p>
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<p>5 (c)</p>	<p>Apart from the mechanism you identified in question 5 (b), identify two (2) other factors that may affect body temperature and briefly explain how one (1) of these two factors affects body temperature.</p> <p>Award one (1) mark for each correct identification, up to two (2) marks and one (1) mark for a brief explanation.</p> <ul style="list-style-type: none"> • Biological sex (1) – female core body temperature is slightly higher than male (1) • Age (1) – older adults have a slightly lower body temperature (1), babies have a slightly higher body temperature (1) • Hormone levels (1) – testosterone and oestrogen may lower body temperature (1) • Diet (1) – some foods can increase body temperature (1) • Levels of activity (1) – increased levels of activity can increase body temperature in the short-term (1) • Ill health (1) – fever (high temperature) can occur as a result of illness (1); this is part of an immune system response (1) • Medication (1) – antibiotics, opioids, antihistamines can raise body temperature (1). Ibuprofen, aspirin, and paracetamol can reduce body temperature (1). 	<p>3</p> <p>AO1=2</p> <p>AO3=1</p>
<p>5 (d)</p>	<p>Identify the vitamin synthesised by the skin and explain this process.</p> <p>Award one (1) mark for correct identification.</p> <ul style="list-style-type: none"> • Vitamin D (1). <p>Award up to three (3) marks for an accurate explanation.</p> <ul style="list-style-type: none"> • Occurs in the epidermis (1) • Synthesised using cholesterol in the skin (1) • Dependent on UVB radiation (1) • UVB activates production of cholesterol in liver and in kidney (1) • Vitamin D has a significant role in calcium homeostasis (1). <p>Accept other suitable responses.</p>	<p>4</p> <p>AO1=1</p> <p>AO2=3</p>

Assessment Objective Grid

Question	AO1	AO2	AO3	Total
1(a)	1			1
1(b)	1	2		3
1(c)	2	5	5	12
1(d)	1		3	4
				20
2(a)		3	3	6
2(b)		3	3	6
2(c)	1	3		4
2(d)	1		3	4
				20
3(a)	3			3
3(b)	1	4	4	9
3(c)	1	3		4
3(d)	1		3	4
				20
4(a)	1	3		4
4(b)		3	3	6
4(c)		3	3	6
4(d)	1	3		4
				20
5(a)	1	4	4	9
5(b)	1	3		4
5(c)	2		1	3
5(d)	1	3		4
				20
Total	20	45	35	100