



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

January 2021

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

Assessment code: HSC/SAE

Paper number: Past Paper

## **Mark Scheme**

V4.3 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 the following from learners:

AO1	Recall of knowledge and understanding
AO2	Application of knowledge and understanding
AO3	Analysis to demonstrate knowledge of concepts and theories

Qu	Mark scheme	Total marks															
1 (a)	<p><b>Name the piece of equipment used to measure a pulse manually.</b></p> <p>Award <b>one (1)</b> mark for:</p> <ul style="list-style-type: none"> <li>• Watch (1).</li> </ul> <p><b>NB: Do NOT accept pulse oximeter</b></p>	<p><b>1</b></p> <p><b>AO1=1</b></p>															
1 (b)	<p><b>Explain how the structure of veins assists blood circulation in the body.</b></p> <table border="1" data-bbox="295 779 1225 2002"> <thead> <tr> <th>Level</th> <th>Marks</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>5–6</td> <td> <p>Application of knowledge is appropriate and accurate and shows clear understanding of how the structure of veins assists blood circulation.</p> <p>Analysis to demonstrate understanding of how the structure of veins assists blood circulation is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p> </td> </tr> <tr> <td>2</td> <td>3–4</td> <td> <p>Application of knowledge is mostly appropriate, showing some clear understanding of how the structure of veins assists blood circulation. There may be a few errors.</p> <p>Analysis to demonstrate understanding of how the structure of veins assists blood circulation is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p> </td> </tr> <tr> <td>1</td> <td>1–2</td> <td> <p>Application of knowledge is limited and may show a lack of understanding of how the structure of veins assists blood circulation. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of how the structure of veins assists blood circulation lacks detail and may have limited effectiveness and relevance. Links may be made but are often inappropriate.</p> </td> </tr> <tr> <td></td> <td>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 how the structure of veins assists blood circulation.</p> <p>Analysis to demonstrate understanding of how the structure of veins assists blood circulation 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 veins assists blood circulation. There may be a few errors.</p> <p>Analysis to demonstrate understanding of how the structure of veins assists blood circulation 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 veins assists blood circulation. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of how the structure of veins assists blood circulation lacks detail and may have limited effectiveness and relevance. Links may be made but are often inappropriate.</p>		0	No creditworthy material.	<p><b>6</b></p> <p><b>AO2=3</b></p> <p><b>AO3=3</b></p>
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	<p><u>Indicative content</u></p> <p><b>AO2</b></p> <ul style="list-style-type: none"> <li>• Carry blood towards the heart</li> <li>• Distribute blood from the lungs and tissues in the body</li> <li>• Veins have valves to prevent backflow</li> <li>• Thin muscular walls with low elasticity and contractibility</li> <li>• Low blood pressure within the vein</li> <li>• Larger lumen than arteries as volume of blood increases for diffusion.</li> </ul> <p><b>AO3</b></p> <ul style="list-style-type: none"> <li>• Walls consist of three layers – connective tissue, smooth muscle, and endothelial cells</li> <li>• Translucent, therefore the colour that appears on the exterior of the organism is determined by the colour of the blood</li> <li>• When removed from an organism, veins are greyish white</li> <li>• Can be superficial or deep</li> <li>• Superficial and deep veins are connected by perforator veins and connector veins</li> </ul> <p>Accept other suitable responses.</p>	
<p><b>1 (c)</b></p>	<p><b>Blood is made up of four (4) components.</b></p> <p><b>Write the name of the missing blood component in the table below.</b></p> <p>Award <b>one (1)</b> mark for:</p> <ul style="list-style-type: none"> <li>• White blood cells (1)</li> <li>• Leukocytes (1).</li> </ul> <p><b>N.B. Accept specific examples of WBC</b></p>	<p><b>1</b></p> <p><b>AO1=1</b></p>
<p><b>1 (d)</b></p>	<p><b>Explain the structure and function of the component you named in 1(c).</b></p> <p>Award up to <b>three (3)</b> marks for an appropriate explanation:</p> <ul style="list-style-type: none"> <li>• White blood cells have a nucleus (1)</li> <li>• Lacks haemoglobin (1)</li> <li>• Differentiated for specialised functions (1)</li> <li>• Protect organism against disease (1)</li> <li>• Protect organism against foreign bodies (1)</li> <li>• Grouped into lymphocytes, granulocytes, and monocytes due to their microscopic appearance (1).</li> </ul>	<p><b>3</b></p> <p><b>AO2=3</b></p>

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<b>1 (e)</b>	<p><b>Discuss the relationship between the endocrine and cardiovascular system.</b></p> <table border="1"> <thead> <tr> <th>Level</th> <th>Marks</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><b>3</b></td> <td style="text-align: center;"><b>5–6</b></td> <td> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the relationship between the endocrine and cardiovascular system.</p> <p>Analysis to demonstrate understanding of the relationship between the endocrine and cardiovascular system is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p> </td> </tr> <tr> <td style="text-align: center;"><b>2</b></td> <td style="text-align: center;"><b>3–4</b></td> <td> <p>Application of knowledge is mostly appropriate, showing some clear understanding of the relationship between the endocrine and cardiovascular system. There may be a few errors.</p> <p>Analysis to demonstrate understanding of the relationship between the endocrine and cardiovascular system is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p> </td> </tr> <tr> <td style="text-align: center;"><b>1</b></td> <td style="text-align: center;"><b>1–2</b></td> <td> <p>Application of knowledge is limited and may show a lack of understanding of the relationship between the endocrine and cardiovascular system. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of the relationship between the endocrine and cardiovascular 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;"><b>0</b></td> <td>No creditworthy material.</td> </tr> </tbody> </table>		Level	Marks	Description	<b>3</b>	<b>5–6</b>	<p>Application of knowledge is appropriate and accurate and shows clear understanding of the relationship between the endocrine and cardiovascular system.</p> <p>Analysis to demonstrate understanding of the relationship between the endocrine and cardiovascular system is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p>	<b>2</b>	<b>3–4</b>	<p>Application of knowledge is mostly appropriate, showing some clear understanding of the relationship between the endocrine and cardiovascular system. There may be a few errors.</p> <p>Analysis to demonstrate understanding of the relationship between the endocrine and cardiovascular system is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p>	<b>1</b>	<b>1–2</b>	<p>Application of knowledge is limited and may show a lack of understanding of the relationship between the endocrine and cardiovascular system. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of the relationship between the endocrine and cardiovascular system lacks detail and may have limited effectiveness and relevance. Links may be made but are often inappropriate.</p>		<b>0</b>	No creditworthy material.	<p><b>6</b></p> <p><b>AO2=3</b></p> <p><b>AO3=3</b></p>
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<p><u>Indicative content</u></p> <p><b>AO2</b></p> <ul style="list-style-type: none"> <li>• The endocrine system is a network of glands that produce hormones that can have an effect on the cardiovascular system</li> <li>• The endocrine system is a network of glands and organs that produce, store, and secrete hormones</li> <li>• Hormones play a role in maintaining healthy cardiovascular function</li> <li>• High levels of some hormones can lead to cardiovascular disease such as thyroxine</li> <li>• Increase in blood pressure</li> </ul>																		

	<p><b>AO3</b></p> <ul style="list-style-type: none"> <li>• Increase/raise levels of lipids</li> <li>• Impact on blood vessels (vasodilation and vasoconstriction) depending on what the body needs to do such as re-distribute blood or vascular shunting</li> <li>• The cardiovascular system is the transport mechanism for hormones in the body</li> <li>• Low testosterone levels have been linked to effective cardiovascular functioning</li> <li>• Low oestrogen levels have been linked to effective cardiovascular functioning during the menopause</li> <li>• Insulin levels have been linked to cardiovascular functioning.</li> </ul> <p>Accept other suitable responses.</p>	
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<p><b>1 (f)</b></p>	<p><b>Identify one (1) valve in the heart and explain the structure and function of this valve.</b></p> <p>Award <b>one (1)</b> mark for correct identification and up to <b>two (2)</b> marks for an accurate explanation of structure and function:</p> <ul style="list-style-type: none"> <li>• tricuspid valve (1) – on the right side of the heart (1), has three flaps (1), allows blood to flow from right atrium to right ventricle (1), prevents backflow (1)</li> <li>• pulmonary valve (1) – semilunar valve (1), between right ventricle and pulmonary artery (1), opens when pressure in right ventricle rises above pressure in pulmonary artery (1)</li> <li>• bicuspid valve (1) – on the left side of the heart (1), has two flaps (1), allows blood to flow from left atrium to left ventricle (1), prevents backflow (1)</li> <li>• aortic valve (1) – semilunar valve (1), situated between left ventricle and aorta (1), regulates blood flow from the heart to the aorta (1).</li> <li>• <b>Semilunar valve (1) – Pulmonary valve (1) located between right ventricle and pulmonary trunk (1). Aortic valve (1) located between left ventricle and aorta (1). Prevent backflow (1)</b></li> </ul>	<p><b>3</b></p> <p><b>AO1=1</b></p> <p><b>AO3=2</b></p>
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<p><b>2 (a)</b></p>	<p><b>Discuss the structure and function of skeletal muscles.</b></p> <table border="1" data-bbox="293 1825 1238 2076"> <thead> <tr> <th>Level</th> <th>Marks</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>9–12</td> <td>A wide range of relevant knowledge and understanding of the structure and function of skeletal muscles is shown, which is accurate and detailed.</td> </tr> </tbody> </table>	Level	Marks	Description	3	9–12	A wide range of relevant knowledge and understanding of the structure and function of skeletal muscles is shown, which is accurate and detailed.	<p><b>12</b></p> <p><b>AO1=2</b></p> <p><b>AO2=5</b></p> <p><b>AO3=5</b></p>
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3	9–12	A wide range of relevant knowledge and understanding of the structure and function of skeletal muscles is shown, which is accurate and detailed.						



		<p>Application of knowledge is appropriate and accurate and shows clear understanding of the structure and function of skeletal muscles.</p> <p>Analysis to demonstrate understanding of the structure and function of skeletal muscles is detailed and highly effective, with reasoned judgements related to the structure and function of skeletal muscles made. Clear links are made.</p>
<b>2</b>	<b>5–8</b>	<p>A wide range of relevant knowledge and understanding of the structure and function of skeletal muscles is shown, which is mostly accurate and detailed.</p> <p>Application of knowledge is mostly appropriate, showing some clear understanding of the structure and function of skeletal muscles. There may be a few errors.</p> <p>Analysis to demonstrate understanding of the structure and function of skeletal muscles is effective and mostly relevant, with simplistic judgements related to the structure and function of skeletal muscles made. Some clear links are made.</p>
<b>1</b>	<b>1–4</b>	<p>A limited range of relevant knowledge and understanding of the structure and function of skeletal muscles is shown, and is often fragmented.</p> <p>Application of knowledge is limited and may show a lack of understanding of the structure and function of skeletal muscles. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of the structure and function of skeletal muscles lacks detail and may have limited effectiveness and relevance to the structure and function of skeletal muscles. Links may be made but are often inappropriate.</p>
	<b>0</b>	No creditworthy material.
<p><u>Indicative content</u></p> <p><b>AO1</b></p> <ul style="list-style-type: none"> <li>• Skeletal muscles are under conscious control – voluntary movement</li> <li>• Skeletal muscles vary considerably in size, shape, and arrangement of fibres – striated appearance under a microscope</li> </ul>		

	<ul style="list-style-type: none"> <li>• They range from thin muscles like those in the inner ear to thick muscles like those in the thigh</li> </ul> <p><b>AO2</b></p> <ul style="list-style-type: none"> <li>• Each skeletal muscle fibre is cylindrical in structure and these are bundled together to make muscles</li> <li>• Each muscle is surrounded by connective tissue</li> <li>• The connective tissues protect the muscle cells and allow them to withstand the forces of contraction</li> <li>• Typically, a muscle spans a joint and is connected to bones by tendons at both ends</li> <li>• Through contraction and relaxation, skeletal muscles assist with body movement</li> <li>• Contractions pull on tendons which are attached to bones. This causes the muscle to shorten which in turn causes the bone to move</li> <li>• Muscles often work in antagonistic pairs to allow movement of bones in the body</li> </ul> <p><b>AO3</b></p> <ul style="list-style-type: none"> <li>• Skeletal muscle contraction also assists with posture and support of the body</li> <li>• The contraction and relaxation of skeletal muscles creates kinaesthetic energy which is a large source of heat for the body</li> <li>• Skeletal muscles also offer a layer of protection to bones and internal organs.</li> <li>• Skeletal muscles have an abundant supply of blood vessels and nerves which support the function of contraction</li> <li>• Skeletal muscles transmit nerve impulses to help stimulate muscle movement</li> </ul> <p>Accept other suitable responses.</p>	
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<p><b>2 (b)</b></p>	<p><b>There are four (4) main roles of muscles.</b></p> <p><b>Write the name of the missing role of muscles in the table below.</b></p> <p>Award <b>one (1)</b> mark for:</p> <ul style="list-style-type: none"> <li>• Fixator (1).</li> </ul>	<p><b>1</b></p> <p><b>AO1=1</b></p>
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<p><b>2 (c)</b></p>	<p><b>Describe the function of the role of muscles you named in 2(b).</b></p> <p>Award up to <b>three (3)</b> marks for an appropriate description:</p>	<p><b>3</b></p> <p><b>AO2=3</b></p>
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	<ul style="list-style-type: none"> <li>• Stabilises the origin of the agonist (1)</li> <li>• Stabilises the joint that the origin moves over (1)</li> <li>• Assists the agonist as it contracts (1)</li> <li>• Majority of fixators are found in the hips and shoulders (1).</li> </ul> <p>Accept other suitable responses.</p>	
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<b>2 (d)</b>	<p><b>Fibrous and synovial are two (2) types of joint in the human body.</b></p> <p><b>Identify and describe the other type of joint.</b></p> <p>Award <b>one (1)</b> mark for correct identification and up to <b>three (3)</b> marks for an accurate description:</p> <ul style="list-style-type: none"> <li>• Cartilaginous (1) – connected entirely by cartilage (1), allow more movement than fibrous joints (1), allow less movement than synovial joints (1), examples include the spine, ribs or pubic symphysis (1), a tough but flexible type of connective tissue (1).</li> </ul>	<p><b>4</b></p> <p><b>AO1=1</b></p> <p><b>AO2=3</b></p>
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<b>3 (a)</b>	<p><b>Identify the hormone in osmoregulation and describe the function of this hormone.</b></p> <p>Award <b>one (1)</b> mark for correct identification and up to <b>two (2)</b> marks for an accurate description:</p> <ul style="list-style-type: none"> <li>• Anti-Diuretic Hormone (1) – constantly regulates fluid balance (1), tells kidneys to conserve water (1), this decreases urine volume (1), osmotic sensors and baroreceptors work with ADH to maintain water metabolism (1).</li> </ul> <p>Accept ADH (1).</p>	<p><b>3</b></p> <p><b>AO1=1</b></p> <p><b>AO2=2</b></p>
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<b>3 (b)</b>	<p><b>Body temperature is maintained through the process of thermoregulation.</b></p> <p><b>Discuss the process of thermoregulation.</b></p> <table border="1"> <thead> <tr> <th>Level</th> <th>Marks</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>7–9</td> <td> <p>A wide range of relevant knowledge and understanding of the homeostatic mechanism of thermoregulation is shown, which is accurate and detailed.</p> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the homeostatic mechanism of thermoregulation.</p> </td> </tr> </tbody> </table>	Level	Marks	Description	3	7–9	<p>A wide range of relevant knowledge and understanding of the homeostatic mechanism of thermoregulation is shown, which is accurate and detailed.</p> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the homeostatic mechanism of thermoregulation.</p>	<p><b>9</b></p> <p><b>AO1=1</b></p> <p><b>AO2=4</b></p> <p><b>AO3=4</b></p>
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3	7–9	<p>A wide range of relevant knowledge and understanding of the homeostatic mechanism of thermoregulation is shown, which is accurate and detailed.</p> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the homeostatic mechanism of thermoregulation.</p>						

		Analysis to demonstrate understanding of the homeostatic mechanism of thermoregulation is detailed and highly effective, with reasoned judgements related to the maintenance of body temperature made. Clear links are made.
<b>2</b>	<b>4–6</b>	<p>A wide range of relevant knowledge and understanding of the homeostatic mechanism of thermoregulation 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 homeostatic mechanism of thermoregulation. There may be a few errors.</p> <p>Analysis to demonstrate understanding of the homeostatic mechanism of thermoregulation is effective and mostly relevant, with simplistic judgements related to the maintenance of body temperature made. Some clear links are made.</p>
<b>1</b>	<b>1–3</b>	<p>A limited range of relevant knowledge and understanding of the homeostatic mechanism of thermoregulation is shown and is often fragmented.</p> <p>Application of knowledge is limited and may show a lack of understanding of the homeostatic mechanism of thermoregulation. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of the homeostatic mechanism of thermoregulation lacks detail and may have limited effectiveness and relevance to the maintenance of body temperature. Links may be made but are often inappropriate.</p>
	<b>0</b>	No creditworthy material.
<p><u>Indicative content</u></p> <p><b>AO1</b></p> <ul style="list-style-type: none"> <li>• This is a process of homeostasis</li> <li>• The body maintains a constant internal core temperature despite changes to the external temperature.</li> </ul> <p><b>AO2</b></p> <ul style="list-style-type: none"> <li>• If the external temperature rises:</li> </ul>		

	<ul style="list-style-type: none"> <li>– the sweat glands are instructed to release sweat which causes heat loss through evaporation</li> <li>– the hairs on the skin lay flat which prevents the trapping of heat between the skin and the hair, which increases heat loss through convection</li> <li>– vasodilation occurs, allowing increased blood flow and redirecting blood flow to the skin which increases heat loss through convection and conduction</li> <li>• If the external temperature falls:             <ul style="list-style-type: none"> <li>– the hairs on the skin become erect, trapping air between the skin and the hair to improve insulation</li> <li>– the erector muscles that cause hair to stand also cause swelling in the skin called goose bumps, which adds insulation</li> <li>– vasoconstriction occurs, moving the blood vessels away from the skin and preventing heat loss through convection and conduction</li> <li>– muscles receive messages to start movements called shivering. This creates heat through kinaesthetic energy</li> </ul> </li> </ul> <p><b>AO3</b></p> <ul style="list-style-type: none"> <li>• A rise in body temperature is detected by thermo receptors which send information to the hypothalamus</li> <li>• The hypothalamus instructs the pituitary gland to release hormones to regulate internal temperature</li> <li>• This process is called negative feedback</li> <li>• Thermoregulation prevents hyperthermia (the body overheating)</li> <li>• Thermoregulation prevents hypothermia (the body becoming too cold).</li> </ul> <p>Accept other suitable responses.</p>	
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<p><b>3 (c)</b></p>	<p><b>Identify one (1) of the main hormones in glucoregulation and explain the role of this hormone.</b></p> <p>Award <b>one (1)</b> mark for correct identification and up to <b>three (3)</b> marks for an accurate explanation:</p> <ul style="list-style-type: none"> <li>• Insulin (1) – peptide hormone (1), produced in islets in pancreas (1), regulates the metabolism of carbohydrates (1), absorbs glucose from the blood into the liver (1)</li> <li>• Glucagon (1) – peptide hormone (1), produced by alpha cells in the pancreas (1), raises the concentration of glucose (1), the main catabolic hormone in the human body (1).</li> </ul> <p>Accept other suitable responses.</p>	<p><b>4</b></p> <p><b>AO1=1</b></p> <p><b>AO2=3</b></p>
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<p><b>3 (d)</b></p>	<p><b>Negative feedback is one (1) homeostatic mechanism.</b></p> <p><b>Identify the other homeostatic mechanism and explain the function of this mechanism.</b></p> <p>Award <b>one (1)</b> mark for correct identification and up to <b>three (3)</b> marks for an accurate explanation:</p> <ul style="list-style-type: none"> <li>• Positive feedback (1) – maintains the direction of a stimulus (1), can accelerate the stimulus (1), examples include blood clotting (1), uterine contractions in childbirth (1).</li> </ul> <p>Accept other suitable responses.</p>	<p><b>4</b></p> <p><b>AO1=1</b></p> <p><b>AO3=3</b></p>
<p><b>4 (a)</b></p>	<p><b>Identify two (2) layers of the skin and briefly describe one (1) of these layers.</b></p> <p>Award <b>one (1)</b> mark for each correct identification and <b>one (1)</b> mark for a brief description:</p> <ul style="list-style-type: none"> <li>• Epidermis (1) – outermost layer of skin (1), protects against pathogen (1), regulates water loss through the skin (1). <b>Waterproof layer (1)</b></li> <li>• Dermis (1) – between epidermis and subcutaneous (1), cushions body against damage (1), contains thermoreceptors (1)</li> <li>• Subcutaneous/hypodermis (1) – lowermost layer of skin (1), primarily composed of adipose tissue (fats) (1), contains larger blood vessels and nerves (1).</li> </ul> <p>Accept other suitable responses.</p>	<p><b>3</b></p> <p><b>AO1=2</b></p> <p><b>AO2=1</b></p>

<b>4 (b)</b>	<b>Discuss the effects of ill health on physiological measurements.</b>		<b>9</b>
			<b>AO1=1</b>
			<b>AO2=4</b>
			<b>AO3=4</b>
	<b>Level</b>	<b>Marks</b>	<b>Description</b>
	<b>3</b>	<b>7–9</b>	<p>A wide range of relevant knowledge and understanding of the effects of ill health on physiological measurements is shown, which is accurate and detailed.</p> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the effects of ill health on physiological measurements</p> <p>Analysis to demonstrate understanding of the effects of ill health on physiological measurements is detailed and highly effective, with reasoned judgements related to the effects of ill health on physiological measurements made. Clear links are made.</p>
	<b>2</b>	<b>4–6</b>	<p>A wide range of relevant knowledge and understanding of the effects of ill health on physiological measurements 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 effects of ill health on physiological measurements. There may be a few errors.</p> <p>Analysis to demonstrate understanding of the effects of ill health on physiological measurements is effective and mostly relevant, with simplistic judgements related to the effects of ill health on physiological measurements made. Some clear links are made.</p>
	<b>1</b>	<b>1–3</b>	<p>A limited range of relevant knowledge and understanding of the effects of ill health on physiological measurements is shown and is often fragmented.</p> <p>Application of knowledge is limited and may show a lack of understanding of the effects of ill health on physiological measurements. There may be a number of errors.</p> <p>Analysis to demonstrate understanding of the effects of ill health on physiological measurements lacks detail and may have</p>

		limited effectiveness and relevance to the effects of ill health on physiological measurements. Links may be made but are often inappropriate.
	<b>0</b>	No creditworthy material.

Indicative content

**AO1**

- Long-term illness can make a person less active. This may have the effect of reducing physiological measurements when resting
- Long-term illness could also increase physiological measurements such as blood pressure and resting heart rate (pulse)

**AO2**

- The above can, however, have the opposite effect on exertion of the individual with a long-term illness
- The immune response to infections and invading microorganisms is to increase the core body temperature
- Atheroma or arteriosclerosis can increase blood pressure and pulse rate
- Lung disorders such as emphysema, asthma and bronchitis can reduce oxygen saturation rates and respiration rates, making breathing more frequent and shallower
- Kidney disease can increase blood pressure due to releasing extra fluids into the bloodstream

**AO3**

- Diabetes can reduce body temperature
- Thyroid disorders can increase or reduce blood pressure (hyperthyroidism will increase, whereas hypothyroidism will reduce)
- Adrenal disorders can increase or reduce blood pressure (overactive adrenal glands will increase, whereas underactive adrenal glands will reduce)
- Illnesses such as kidney disease and diabetes can cause hypertension which will increase blood pressure; however, diabetes can also cause hypotension which will reduce blood pressure
- Mental illnesses such as anxiety can have the effect of increasing blood pressure and pulse, whereas depression can have the effect of reducing blood pressure and pulse.

Accept other suitable responses.

**NB: Do not accept the effects of medication.**



<p><b>4 (c)</b></p>	<p><b>Phagocytes are concerned with innate immunity. Lymphocytes are concerned with adaptive immunity.</b></p> <p><b>Identify</b> one (1) <b>type of lymphocyte</b> and <b>describe its function.</b></p> <p>Award <b>one (1)</b> mark for correct identification and up to <b>three (3)</b> marks for an accurate description:</p> <ul style="list-style-type: none"> <li>• T Cells (1) – scan the body for infections (1), help other cells in the immune system to control the immune response (1), prevent autoimmune disease (1), ‘remember’ previous antigens to protect the body in the future (1) <b>Helper T Cells help stimulate B Cells to make antibodies (1) Helper T Cells help Killer T Cell development (1)</b></li> <li>• B Cells (1) – circulate in body to start a fast-immune response (1), can remain in body for decades (1), become memory cells (1), have protective anti-inflammatory effect (1) <b>Produce specific antibodies (1)</b></li> </ul> <p>Accept other suitable responses.</p>	<p><b>4</b></p> <p><b>AO1=1</b></p> <p><b>AO2=3</b></p>
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<p><b>4 (d)</b></p>	<p><b>Bone supports structure and attaches muscles to the body.</b></p> <p><b>Identify</b> and <b>explain</b> one (1) other <b>function of bone.</b></p> <p>Award <b>one (1)</b> mark for correct identification and up to <b>three (3)</b> marks for an accurate explanation:</p> <ul style="list-style-type: none"> <li>• Protects organs (1) – bones protect, the skull is hard and protects the brain from damage (1). The ribcage protects the main internal organs of the thorax (1). Vertebrae protects the spinal cord (1).</li> <li>• Storage of calcium (1) – the body cannot make calcium (1), calcium is essential for cell functioning (1), bones are a living organ comprised of calcium (1), 99% of body’s calcium is contained in bones (1)</li> <li>• Production of blood cells (1) – bone cavities contain bone marrow (1), bone marrow is a connective tissue (1), bone marrow is the primary site for blood cell production (1), produces 500bn blood cells a day (1).</li> </ul> <p>Accept other suitable responses.</p>	<p><b>4</b></p> <p><b>AO1=1</b></p> <p><b>AO3=3</b></p>
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<p><b>5 (a)</b></p>	<p><b>The Central Nervous System (CNS) has two (2) structures.</b></p>	<p><b>4</b></p>
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	<p><b>Name the two (2) structures of the CNS and describe one (1) of these structures.</b></p> <p>Award <b>one (1)</b> mark for <b>each</b> correct identification and up to <b>two (2)</b> marks for an accurate description:</p> <ul style="list-style-type: none"> <li>• Brain (1) – located in the skull (cranium) (1), serves at the centre of the nervous system (1), the most complex organ in the human body (1), central processing unit (1), largest portion of the CNS system (1), the brain processes and interprets sensory information sent from the spinal cord (1)</li> <li>• Spinal cord (1) – long, thin tubular structure (1), runs the length of the spine (1), contains cerebrospinal fluid (1), centre for controlling reflexes (1).</li> </ul> <p>Accept other suitable responses.</p>	<p><b>AO1=2</b></p> <p><b>AO2=2</b></p>
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<b>5 (b)</b>	<p><b>Explain the reasons for recording physiological measurements in an accurate and timely manner.</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <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;"><b>3</b></td> <td style="text-align: center;"><b>5–6</b></td> <td> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the reasons for recording physiological measurements in an accurate and timely manner.</p> <p>Analysis to demonstrate understanding of the reasons for recording physiological measurements in an accurate and timely manner is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p> </td> </tr> <tr> <td style="text-align: center;"><b>2</b></td> <td style="text-align: center;"><b>3–4</b></td> <td> <p>Application of knowledge is mostly appropriate, showing some clear understanding of the reasons for recording physiological measurements in an accurate and timely manner.</p> <p>Analysis to demonstrate understanding of the reasons for recording physiological measurements in an accurate and timely manner is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p> </td> </tr> <tr> <td style="text-align: center;"><b>1</b></td> <td style="text-align: center;"><b>1–2</b></td> <td> <p>Application of knowledge is limited and may show a lack of understanding of the reasons for recording physiological measurements in an accurate and timely manner. There may be a number of errors.</p> </td> </tr> </tbody> </table>	Level	Marks	Description	<b>3</b>	<b>5–6</b>	<p>Application of knowledge is appropriate and accurate and shows clear understanding of the reasons for recording physiological measurements in an accurate and timely manner.</p> <p>Analysis to demonstrate understanding of the reasons for recording physiological measurements in an accurate and timely manner is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p>	<b>2</b>	<b>3–4</b>	<p>Application of knowledge is mostly appropriate, showing some clear understanding of the reasons for recording physiological measurements in an accurate and timely manner.</p> <p>Analysis to demonstrate understanding of the reasons for recording physiological measurements in an accurate and timely manner is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p>	<b>1</b>	<b>1–2</b>	<p>Application of knowledge is limited and may show a lack of understanding of the reasons for recording physiological measurements in an accurate and timely manner. There may be a number of errors.</p>	<p><b>6</b></p> <p><b>AO2=3</b></p> <p><b>AO3=3</b></p>
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Indicative content

**AO2**

- Professionals are required to follow policies and procedures. Failure to do so could result in disciplinary action
- It is important that professionals keep individuals in their care safe. Failing to record in an accurate and timely manner could risk the health of individuals
- Monitoring the health of individuals is important. Failure to accurately record physiological measurements in a timely manner could prevent accurate monitoring
- This may also lead to changes in the health of the individual not being detected, resulting in the condition of the individual worsening

**AO3**

- Frequency of measurement will be recorded in a care plan. Not following the care plan may interfere with the individual receiving the appropriate care
- Accurate and timely recordings assist with the diagnosis of individuals
- This in turn will assist with individuals receiving the correct treatment
- In some cases, not taking physiological measurements in an accurate and timely manner could result in negative consequences for the treatment outcomes of individuals.

Accept other suitable responses.

<b>5 (c)</b>	<p><b>The Peripheral Nervous System (PNS) is made up of two (2) nervous systems.</b></p> <p><b>Name the two (2) nervous systems that make up the PNS and describe one (1) of these systems.</b></p> <p>Award <b>one (1)</b> mark for <b>each</b> correct identification and up to <b>two (2)</b> marks for an accurate description of the identified nervous system:</p> <ul style="list-style-type: none"> <li>• Somatic Nervous System (SNS) (1) – associated with the voluntary control of body movements (1), made up of sensory nerves (1) and motor nerves (1), voluntary reflex arcs (1)</li> <li>• Autonomic Nervous System (ANS) (1) – associated with involuntary control of body (1), controls internal organs (1) and smooth muscles (1).</li> </ul> <p>Accept other suitable responses.</p>	<p><b>4</b></p> <p><b>AO1=2</b></p> <p><b>AO3=2</b></p>
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<b>5 (d)</b>	<p><b>Explain the structure and function of the male reproductive system.</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Level</th> <th style="text-align: center;">Marks</th> <th style="text-align: center;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;"><b>3</b></td> <td style="text-align: center; vertical-align: top;"><b>5–6</b></td> <td> <p>Application of knowledge is appropriate and accurate and shows clear understanding of the structure and function of the male reproductive system</p> <p>Analysis to demonstrate understanding of the structure and function of the male reproductive system is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p> </td> </tr> <tr> <td style="text-align: center; vertical-align: top;"><b>2</b></td> <td style="text-align: center; vertical-align: top;"><b>3–4</b></td> <td> <p>Application of knowledge is mostly appropriate, showing some clear understanding of the structure and function of the male reproductive system.</p> <p>Analysis to demonstrate understanding of the structure and function of the male reproductive system is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p> </td> </tr> <tr> <td style="text-align: center; vertical-align: top;"><b>1</b></td> <td style="text-align: center; vertical-align: top;"><b>1–2</b></td> <td> <p>Application of knowledge is limited and may show a lack of understanding of the structure and function of the male reproductive system. There may be a number of errors.</p> </td> </tr> </tbody> </table>	Level	Marks	Description	<b>3</b>	<b>5–6</b>	<p>Application of knowledge is appropriate and accurate and shows clear understanding of the structure and function of the male reproductive system</p> <p>Analysis to demonstrate understanding of the structure and function of the male reproductive system is detailed and highly effective, with clearly reasoned consequences. Clear links are made.</p>	<b>2</b>	<b>3–4</b>	<p>Application of knowledge is mostly appropriate, showing some clear understanding of the structure and function of the male reproductive system.</p> <p>Analysis to demonstrate understanding of the structure and function of the male reproductive system is effective and mostly relevant, with simplistic consequences. Some clear links are made.</p>	<b>1</b>	<b>1–2</b>	<p>Application of knowledge is limited and may show a lack of understanding of the structure and function of the male reproductive system. There may be a number of errors.</p>	<p><b>6</b></p> <p><b>AO2=3</b></p> <p><b>AO3=3</b></p>
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Indicative content

**AO2**

- To produce, maintain and transport sperm (male reproductive cells) and semen (a protective fluid):
  - sperm is produced in the testes
  - it is then matured in the epididymis
  - it then travels along the vas deferens
  - the seminal vesicles produce fructose to give the sperm energy
  - the prostate gland adds fluid to the semen to protect and nourish sperm
- To discharge sperm within the female reproductive tract during sex:
  - the urethra passes through the prostate gland and on through the penis to its tip
  - ejaculation occurs which releases the semen and sperm into the female reproductive tract

**AO3**

- To produce and secrete male sex hormones responsible for maintaining the male reproductive system:
  - testosterone is produced in the testes
  - testosterone is a type of androgen
  - testosterone plays a key role in the development of male reproductive tissues
  - testosterone is responsible for changes to primary and secondary sex characteristics at puberty.

Accept other suitable responses.

### Assessment Objective Grid

Question	AO1	AO2	AO3	Total
1a	1			1
1b		3	3	6
1c	1			1
1d		3		3
1e		3	3	6
1f	1		2	3
				<b>20</b>
2a	2	5	5	12
2b	1			1
2c		3		3
2d	1	3		4
				<b>20</b>
3a	1	2		3
3b	1	4	4	9
3c	1	3		4
3d	1		3	4
				<b>20</b>
4a	2	1		3
4b	1	4	4	9
4c	1	3		4
4d	1		3	4
				<b>20</b>
5a	2	2		4
5b		3	3	6
5c	2		2	4
5d		3	3	6
				<b>20</b>
<b>Total</b>	<b>20</b>	<b>45</b>	<b>35</b>	<b>100</b>