# NCFE CACHE Level 3 Extended Diploma in Health and Social Care (Adults) (Northern Ireland) (603/5355/7)

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

Unit title: Anatomy and physiology for health and social care

Spring 2024

Assessment code: HSCNI/SAE
Paper number: P002213

## Mark Scheme

v1.0 Post-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 back 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. You must also consider the relative weightings of the assessment objectives, so as not to over/under credit a response. 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:

| | |
|---|---|
| **AO1** | Recall knowledge and show understanding. |
| **AO2** | Apply knowledge and understanding. |
| **AO3** | Analyse to demonstrate knowledge of concepts and/or theories. |

| Qu | Mark scheme | Total marks |
|---|---|---|

**Section A** **Total for this section: 20 marks**

| | | |
|---|---|---|
| **1 (a)** | **Identify the piece of equipment used to measure temperature.**<br><br>**A: Pulse Oximeter**<br><br>**B: Sphygmomanometer**<br><br>**C: Stethoscope**<br><br>**D: Thermometer**<br><br>Award one (1) mark for the correct answer.<br><br>D: Thermometer. | **1**<br><br>**AO1=1** |

| | | |
|---|---|---|
| **1 (b)** | **Identify the type of consent required to carry out this procedure** and **describe what is meant by this type of consent.**<br><br>Award one (1) mark for a correct identification:<br><br>• informed consent (1).<br><br>Award up to three (3) marks for an accurate description.<br><br>• Individual is informed about the procedure (1)<br>• Individual is aware of any risks (1)<br>• Individual agrees to procedure in writing (1)<br>• In some circumstances, individual may agree verbally (1).<br>• Accept if they understand<br><br>Accept other suitable responses. | **4**<br><br>**AO1=1**<br><br>**AO2=3** |

| | | |
|---|---|---|
| **1 (c)** | **Statins and inhalers are two medications that have an effect on physiological measurements.**<br><br>**Identify** two (2) other **medications that have an effect on physiological measurements** and **explain the effects on physiological measurements of** one (1) **of the medications identified.**<br><br>Award up to two (2) marks for correct identification:<br><br>• beta-blockers (1) Hypertensive drugs<br>• paracetamol (1) Ibuprofen (1) Codeine (1) | **5**<br><br>**AO1=2**<br><br>**AO3=3** |

| | | |
|---|---|---|
| | • prednisolone (1).<br>• Insulin (1).<br>• Opioids<br><br>Award up to three (3) marks for an accurate explanation.<br><br>• Beta-blockers – may reduce blood pressure (1) can also reduce pulse rate (1) making it harder to regulate body temperature (1). May increase respiratory rate (1).<br>• Paracetamol / Ibuprofen – may reduce temperature (1) which may reduce respiratory rate (1). May increase blood pressure (1) and increase pulse rate (1).<br>• Prednisolone –may increase pulse rate (1) and increase blood pressure (1). May reduce body temperature (1) and increase respiratory rate (1).<br>• Opioids decrease heart rate (1) and BP (1) and increases temperature.<br>• Insulin increases heart rate (1) and decreases temperature.<br><br>Accept other suitable responses.<br>Do not accept contraceptive pills. | |

| | | | | |
|---|---|---|---|---|
| **1 (d)** | **Explain failure of homeostatic balance in thermoregulation.** | | | **6**<br><br>**AO2=3**<br><br>**AO3=3** |
| | **Level** | **Mark** | **Description** | |
| | **3** | **5–6** | Application of knowledge is appropriate and accurate and shows clear understanding of failure of homeostatic balance in thermoregulation.<br><br>Analysis to demonstrate understanding of failure of homeostatic balance in thermoregulation is detailed and highly effective, with clearly reasoned consequences. Clear links are made. | |
| | **2** | **3–4** | Application of knowledge is mostly appropriate, showing some clear understanding of failure of homeostatic balance in thermoregulation. There may be a few errors.<br><br>Analysis to demonstrate understanding of failure of homeostatic balance in thermoregulation 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 failure of homeostatic balance in thermoregulation. There may be a number of errors.<br><br>Analysis to demonstrate understanding of failure of homeostatic balance in thermoregulation lacks detail and may have limited effectiveness and relevance. Links may be made but are often inappropriate. |
| | | | **0** | No creditworthy material |

**Indicative content**

**AO2**

- If the body temperature becomes dangerously low (below 35°C), it is called hypothermia
- Symptoms could include shivering and skin that is cold to the touch
- If the body temperature becomes dangerously high (above 40°C), it is called hyperthermia
- Symptoms include reddening of the skin, and thickening of the blood leading to an increase in pulse rate

**AO3**

- Hypothermia can also cause speech to become slurred
- Breathing may become slow with hypothermia leading to tiredness and exhaustion
- Hyperthermia can also cause muscle cramps and fatigue
- Hyperthermia may also cause headaches, dizziness and nausea.

Accept other suitable responses.

| | | |
|---|---|---|
| **1 (e)** | **Identify** four (4) **structures in the urinary system.**<br><br>Award up to four (4) marks for correct identification:<br><br>• kidney(s) (1)<br>• ureters (1)<br>• bladder (1)<br>• urethra (1). | **4**<br><br>**AO1=4** |

| | | |
|---|---|---|
| | Do not accept Penis as it's genitalia.<br><br>Do not accept urinary tract as it is the whole urinary system. | |

**Section B** **Total for this section: 20 marks**

**2 (a)** **Discuss the likely effects of cardiovascular disease on Noah's wellbeing.**

**12**

**AO1=2**

**AO2=5**

**AO3=5**

| Level | Mark | Description |
|---|---|---|
| **3** | **9–12** | A wide range of relevant knowledge and understanding of the likely effects of cardiovascular disease on Noah's wellbeing is shown, which is accurate and detailed.<br><br>Application of knowledge is appropriate and accurate and shows clear understanding of the likely effects of cardiovascular disease on Noah's wellbeing.<br><br>Analysis to demonstrate understanding of the likely effects of cardiovascular disease on Noah's wellbeing is detailed and highly effective, with reasoned judgements made. Clear links are made. |
| **2** | **5–8** | A range of relevant knowledge and understanding of the likely effects of cardiovascular disease on Noah's wellbeing is shown. There may be a few errors.<br><br>Application of knowledge is mostly appropriate, showing some clear understanding of the likely effects of cardiovascular disease on Noah's wellbeing. There may be a few errors.<br><br>Analysis to demonstrate understanding of the likely effects of cardiovascular disease on Noah's wellbeing is effective and mostly relevant with simplistic judgments made. Some clear links are made. |
| **1** | **1–4** | A limited range of relevant knowledge and understanding of the likely effects of cardiovascular disease on Noah's wellbeing is shown but is often fragmented.<br><br>Application of knowledge is limited and may show a lack of understanding of the likely effects of cardiovascular disease on Noah's wellbeing. There may be a number of errors. |

| | | |
|---|---|---|
| | | Analysis to demonstrate understanding of the likely effects of cardiovascular disease on Noah's wellbeing lacks detail and may have limited effectiveness and relevance to the likely effects of cardiovascular disease on Noah's wellbeing. Links may be made but are often inappropriate. |
| | **0** | No relevant material. |

**Indicative content**

Answers may take a holistic approach or focus on the physical, cognitive, emotional and social aspects of Noah's wellbeing.

<u>Physical</u>

**AO1**

- Noah may have chest pains which may immobilise him
- Noah may suffer from a shortness of breath which limits his levels of activity

**AO2**

- Noah may feel faint, making it difficult to carry out activities
- Noah may feel nauseous, making it harder to eat and drink normally
- Accept tiredness
- Accept fatigue

(Tiredness = usually short tern lack of energy, Fatigue = constant mental and physical exhaustion)

**AO3**

- Noah may experience pain throughout his body and down his arms
- Noah may feel numb, weak or cold throughout his muscles

<u>Cognitive</u>

**AO1**

- Noah may be distracted and lose concentration due to his physical symptoms
- This could lead to forgetfulness and interfere with his normal daily activities

**AO2**

- Noah's attention span could reduce making it harder to carry out his work
- This could lead to difficulties with communication which he needs as a receptionist

**AO3**

- Noah could lose executive cognitive functions, such as problem-solving skills
- Noah could develop vascular dementia, which would lead to permeant cognitive dysfunction

<u>Emotional</u>

**AO1**

- Noah may become worried or anxious about his symptoms and his health
- Noah may also become worried or anxious about his future and his family
- Accept sad or sadness

**AO2**

- Noah may become withdrawn as he feels nobody understands what he is going through
- Noah may develop depression due to having a chronic and painful health condition
- Noah may become worried about his financial wellbeing

**AO3**

- Noah may start to feel angry with himself especially if he has not looked after his health and smoked or has been overweight
- Noah may start to feel lonely, as his feelings overcome him, and he withdraws further

<u>Social</u>

**AO1**

- Noah may not feel like socialising with others for fear of damage to his health
- Noah may struggle to cope with family life due to the pain and discomfort

**AO2**

- Noah may have to take time off work which would reduce his contact with others
- Noah may have to give up hobbies, pastimes and sports activities due to his condition

**AO3**

- Noah may have to leave his job completely if his health deteriorates

| | | |
|---|---|---|
| | • Noah may become socially isolated due to his depressive feelings and lack of opportunity to socialise.<br><br>Accept other suitable responses. | |

| | | |
|---|---|---|
| **2 (b)** | **The heart contains** four (4) **valves that assist it to function correctly.**<br><br>**Name these** four (4) **valves.**<br><br>Award up to four (4) marks for correct identification:<br><br>• bicuspid (mitral) valve (1)<br>• tricuspid valve (1)<br>• aortic valve (1)<br>• pulmonary valve (1).<br><br>**NB:** Accept semi-lunar valve if aortic or pulmonary are not offered. | **4**<br><br>**AO1=4** |

| | | |
|---|---|---|
| **2 (c)** | **One circulatory pathway is the systemic pathway.**<br><br>**Name the** other **circulatory pathway** and **explain the function of this pathway.**<br><br>Award one (1) mark for correct identification:<br><br>• pulmonary (1).<br><br>Award up to three (3) marks for an accurate explanation.<br><br>• Deoxygenated blood is transported from the right ventricle of the heart (1) to the lungs along the pulmonary vein (1) where the blood is oxygenated (1). The oxygenated blood is pumped back along the pulmonary artery (1) to the left atrium of the heart (1).<br>• Accept circuit instead of circulatory<br><br>Accept other suitable responses.<br><br>Do not accept double circulatory system unless they mention the above points. | **4**<br><br>**AO1=1**<br><br>**AO3=3** |

**Section C** **Total for this section: 20 marks**

**3 (a)** **Discuss the likely effects of eczema on Chloe's social and emotional wellbeing.**

**9**

**AO1=3**

**AO2=3**

**AO3=3**

| Level | Mark | Description |
|---|---|---|
| **3** | **7–9** | A wide range of relevant knowledge and understanding of the likely effects of eczema on Chloe's social and emotional wellbeing is shown, which is accurate and detailed.<br><br>Application of knowledge is appropriate and accurate and shows clear understanding of the likely effects of eczema on Chloe's social and emotional wellbeing.<br><br>Analysis to demonstrate understanding of the likely effects of eczema on Chloe's social and emotional wellbeing is detailed and highly effective, with reasoned judgements made. Clear links are made. |
| **2** | **4–6** | A range of relevant knowledge and understanding of the likely effects of eczema on Chloe's social and emotional wellbeing is shown, but may be lacking in sufficient detail, with a few errors.<br><br>Application of knowledge is mostly appropriate, showing some clear understanding of the likely effects of eczema on Chloe's social and emotional wellbeing. There may be a few errors.<br><br>Analysis to demonstrate understanding of the likely effects of eczema on Chloe's social and emotional wellbeing is effective and mostly relevant with simplistic judgments made. Some clear links are made. |
| **1** | **1–3** | A limited range of relevant knowledge and understanding of the likely effects of eczema on Chloe's social and emotional wellbeing is shown but is often fragmented.<br><br>Application of knowledge is limited and may show a lack of understanding of the likely effects of eczema on Chloe's social and emotional wellbeing. There may be a number of errors. |

| | | |
|---|---|---|
| | | Analysis to demonstrate understanding of the likely effects of eczema on Chloe's social and emotional wellbeing lacks detail and may have limited effectiveness and relevance. Links may be made but are often inappropriate. |
| **0** | | No relevant material |

**Indicative content**

<u>Social</u>

**AO1**

- Chloe may not want to go out with her friends due to having a visible rash and possibly being unable to wear makeup
- Chloe might avoid work as she may feel service users would be put off by her rash

**AO2**

- Chloe might not want to engage in intimate relationships with a partner or engage in dating
- Chloe might not want to take part in sports due to sweating irritating her skin

**AO3**

- Chloe might become isolated due to withdrawing from social activities
- Chloe might be reluctant to go on holidays in the future due to her eczema and the fear of flare ups

<u>Emotional</u>

**AO1**

- Chloe might feel embarrassed at having a rash covering her body
- Chloe might feel ashamed and it might affect her self-esteem

**AO2**

- Chloe might start to feel angry and frustrated that she is unable to engage in the social activities that she used to
- Chloe might start to suffer from loneliness as she doesn't see her friends as much

**AO3**

- Chloe may become frustrated due to having to apply creams and lotions on a daily basis in order to carry out her daily activities
- Chloe could start to feel depressed and anxious due to the impact that eczema is having on her life.

Accept other suitable responses.

| | | |
|---|---|---|
| **3 (b)** | **The subcutaneous is one of the primary layers of the skin.** | **5** |

| | | |
|---|---|---|
| | **Name the** two (2) other **primary layers of the skin** and **describe the structure** and / or **function of** one (1) **of the layers named.**<br><br>Award up to two (2) marks for a correct identification:<br><br>• epidermis (1)<br>• dermis (1).<br><br>Award up to three (3) marks for an accurate description.<br><br>• Epidermis – the outer layer of the skin (1). It is the thinnest layer of skin (1) and it protects the body from harm (1). This layer produces new skin cells (1).<br>• Dermis – the middle layer of skin (1). It is the thickest layer of skin (1). It contains connective tissues (1), sweat glands (1), sebaceous glands (1) and follicles (1).<br><br>Accept other suitable responses.<br><br>Epidermis do not produce melanin as melanocytes do. These cells are manufactured by melanoblasts from embryonic cells. Melanocytes can be found in iris as well. | **AO1=2**<br><br>**AO2=3** |

| | | |
|---|---|---|
| **3 (c)** | **The ovaries and vagina are two structures of the female reproductive system.**<br><br>**Name** two (2) other **structures of the female reproductive system.**<br><br>Award up to two (2) marks for correct identification:<br><br>• cervix (1)<br>• fallopian tube(s) (1)<br>• uterus (1). | **2**<br><br>**AO1=2** |

| | | |
|---|---|---|
| **3 (d)** | **Name the** two (2) **hormones produced by the ovaries** and **explain the function of** one (1) **of the hormones named.**<br><br>Award up to two (2) marks for correct identification:<br><br>• oestrogen (1)<br>• progesterone (1).<br><br>Award up to two (2) marks for an accurate explanation.<br><br>• Oestrogen – responsible for the development of the female reproductive system (1) and the secondary sex | **4**<br><br>**AO1=2**<br><br>**AO3=2** |

| | | |
|---|---|---|
| | characteristics (1). It is responsible for regulating the menstrual cycle (1).<br>• Progesterone – prepares the uterus for conception (1) by thickening the endometrium (lining) (1). It stimulates glands in the endometrium to nourish a fertilised embryo (1).<br><br>Accept other suitable responses.<br><br>Accept Testosterone | |

**Section D** **Total for this section: 20 marks**

| | | |
|---|---|---|
| **4 (a)** | **Which** one (1) **of the following is a muscle in the human body?**<br><br>**A: Femur**<br><br>**B: Patella**<br><br>**C: Quadricep**<br><br>**D: Tendon**<br><br>Award one (1) mark for the correct answer.<br><br>C: Quadricep (1). | **1**<br><br>**AO1=1** |

| | | |
|---|---|---|
| **4 (b)** | **One type of muscle is smooth muscle.**<br><br>**Name the** other two (2) **types of muscle** and **describe** one (1) **of the types of muscle named.**<br><br>Award up to two (2) marks for correct identification:<br><br>• cardiac (1)<br>• skeletal (1).<br><br>Award up to two (2) marks for an accurate description.<br><br>• Cardiac – the heart is made of this muscle (1). It maintains a constant rhythm (1) and does not fatigue (1). Involuntary muscle (1).<br>• Skeletal – attached to bones by tendons (1). Allows for movement of the body (1). Consists of paired groups of muscle (1). Voluntary muscle (1).<br><br>Accept other suitable responses. | **4**<br><br>**AO1=2**<br><br>**AO2=2** |

| | | |
|---|---|---|
| | Do not accept striated muscles as bot the cardiac and skeletal muscles are. | |

**4 (c)**

**Explain how the structures and characteristics of a synovial joint assist its function.**

**6**

**AO2=3**

**AO3=3**

| Level | Mark | Description |
|---|---|---|
| **3** | **5–6** | Application of knowledge is appropriate and accurate and shows clear understanding of how the characteristics of a synovial joint assist its function.<br><br>Analysis to demonstrate understanding of how the structures and characteristics of a synovial joint assist its function is detailed and highly effective, with clearly reasoned consequences. Clear links are made. |
| **2** | **3–4** | Application of knowledge is mostly appropriate, showing some clear understanding of how the characteristics of a synovial joint assist its function. There may be a few errors.<br><br>Analysis to demonstrate understanding of how the structures and characteristics of a synovial joint assist its function 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 how the characteristics of a synovial joint assist its function. There may be a number of errors.<br><br>Analysis to demonstrate understanding of how the structures and characteristics of a synovial joint assist its function 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 joint has a synovial capsule, which is a completely closed cavity
- The capsule is composed of smooth cartilage that covers the bones
- This cavity is filled with synovial fluid
- This allows the joint to be freely moveable

| | | |
|---|---|---|
| | **AO3**<br>• The joint capsule is lined by a synovial membrane that produces the synovial fluid<br>• The smooth cartilage and the synovial membrane are continuous<br>• The cartilage reduces friction at the end of the bones<br>• The synovial fluid lubricates the moving parts.<br>• Accept shock absorbing<br><br>Accept other suitable responses. | |

| | | |
|---|---|---|
| **4 (d)** | **The skeletal system can be separated into two specific sections of skeleton.**<br><br>**Name these** two (2) **sections of the skeletal system.**<br><br>Award up to two (2) marks for correct identification:<br><br>• appendicular (1)<br>• axial (1). | **2**<br><br>**AO1=2** |

| | | |
|---|---|---|
| **4 (e)** | **Name the response mechanism activated by stress** and **explain the effect it can have on physiological measurements.**<br><br>Award one (1) mark for correct identification:<br><br>• fight or flight (1).<br><br>Award up to two (2) marks for an accurate explanation:<br><br>• adrenaline is released causing the heart to beat faster increasing pulse (1)<br>• this increase in heart rate causes an increase in blood pressure (1)<br>• due to the increase in heart rate and blood pressure the body temperature rises (1)<br>• more oxygen is required to be delivered to working muscles causing the respiratory rate to increase (1).<br>• Accept Cortisol released to trigger the release of glucose for utilisation in muscles flight reaction and increases the heart rate for delivery<br><br>Accept other suitable responses. | **3**<br><br>**AO1=1**<br><br>**AO3=2** |

| | | |
|---|---|---|
| | Do not accept heart rate increasing or BP rising etc unless referred to adrenaline of cortisol release | |

| | | |
|---|---|---|
| **4 (f)** | **The skin helps the body cool when it gets too hot.**<br><br>**Identify** two (2) **mechanisms in the skin that help the body cool** and **explain how** one (1) **of the mechanisms identified achieves this.**<br><br>Award up to two (2) marks for correct identification:<br><br>• hairs lie flat (1)<br>• vasodilation (1)<br>• sweating (1).<br><br>Award up to two (2) marks for an accurate explanation:<br><br>• hairs lie flat – this creates a flat non insulating surface (1) which allows air to cool the skin (1) and facilitates evaporation of sweat (1)<br>• vasodilation - blood vessels expand (1) and move closer to the surface of the skin (1) providing a larger surface area of blood vessel to be cooled by the air (1)<br>• sweating – heat is trapped in the sweat (1) on reaching the surface it evaporates (1) allowing heat to escape via convection (1).<br><br>Accept other suitable responses. | **4**<br><br>**AO1=2**<br><br>**AO3=2** |

## Assessment Objective Grid

| Question | AO1 | AO2 | AO3 | Total |
|---|---|---|---|---|
| 1(a) | 1 | | | 1 |
| 1(b) | 1 | 3 | | 4 |
| 1(c) | 2 | | 3 | 5 |
| 1(d) | | 3 | 3 | 6 |
| 1(e) | 4 | | | 4 |
| | | | | **20** |
| 2(a) | 2 | 5 | 5 | 12 |
| 2(b) | 4 | | | 4 |
| 2(c) | 1 | | 3 | 4 |
| | | | | **20** |
| 3(a) | 3 | 3 | 3 | 9 |
| 3(b) | 2 | 3 | | 5 |
| 3(c) | 2 | | | 2 |
| 3(d) | 2 | | 2 | 4 |
| | | | | **20** |
| 4(a) | 1 | | | 1 |
| 4(b) | 2 | 2 | | 4 |
| 4(c) | | 3 | 3 | 6 |
| 4(d) | 2 | | | 2 |
| 4(e) | 1 | | 2 | 3 |
| 4(f) | 2 | | 2 | 4 |
| | | | | **20** |
| **Total** | **32** | **22** | **26** | **80** |