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

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Assessment code: HSCNI/SAE
Paper number: P001445

Mark Scheme

v1.0 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. 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	Analysis to demonstrate understanding of concepts and theories.

Qu	Mark scheme	Total marks

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

1 (a)	**Which** one (1) **of the following is an invasive site for measuring a person's temperature?** Award **one** mark for correct answer: **D: Rectal**	**1** **AO1=1**

1 (b)	**Occasionally, physiological measurements may be a cause for concern.** **Identify** three (3) **appropriate people that should be informed when physiological measurements are a cause for concern** and **explain the importance of informing people.** Award **one** mark for each correct identification up to **three** marks: • manager (1) • doctor (1) • senior nurse (1) • supervisor (1). • Patient (1) Award up to **three** marks for an accurate explanation: • Practitioners must follow policies and procedures (1). These will include lines of reporting (1). Practitioners must follow care plans (1) which will safeguard the individual (1). Practitioners should be aware of changes in health to the individual (1). Accept other suitable responses	**6** **AO1=3** **AO3=3**

1 (c)	**Explain the process of thermoregulation.** **Level 3** / **Mark 5–6** / **Description**: Application of knowledge is appropriate and accurate and shows clear understanding of the process of thermoregulation. Analysis to demonstrate understanding of the process of thermoregulation is detailed and highly effective, with clearly reasoned consequences. Clear links are made.	**6** **AO2=3** **AO3=3**

2	**3–4**	Application of knowledge is mostly appropriate, showing some clear understanding of the process of thermoregulation. There may be a few errors. Analysis to demonstrate understanding of the process of 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 the process of thermoregulation. There may be a number of errors. Analysis to demonstrate understanding of the process of thermoregulation lacks detail and may have limited effectiveness and relevance. Links may be made but are often inappropriate.
	0	No relevant material.

Accept base temp, shivering, sweating, cooling down,

Indicative content

AO2

- Thermoregulation is a type of homeostasis.
- Temperature receptors in the skin and temperature receptors within the body detect when the body temperature moves away from desired temperature.
- If the body temperature is too high, the body responds by vasodilation to expose more surface area of blood to the external environment to cool it down. The sweat glands produce more sweat to help release heat through evaporation and the hairs erect to expose the surface of the skin to the environment.
- If the body temperature is low, the body responds with vasoconstriction to conserve the heat in the blood, by shivering to produce heat through kinaesthetic motion and the hairs lie flat to add extra insulation to the skin.

AO3

- The hypothalamus has a role in homeostasis/thermoregulation. It receives the information from the receptors and acts to maintain desired body temperature.
- The hypothalamus maintains stability via signals to the pituitary gland to release hormones or sending signals directly to receptor nerves.
- Temperature receptors in the skin and temperature receptors within the body constantly monitor the internal body temperature. When the body temperature returns to the desired temperature, the hypothalamus stops sending the signals to halt the process.

	Accept other suitable responses.	

1 (d)	**Name** three (3) **hormones produced by the pituitary gland.** Award **one mark** for each correct identification up to **three** marks: • somatotrophin (1) • prolactin (1) • luteinising hormone (LH) (1) • follicle stimulating hormone (FSH) (1) • oxytocin (1) • antidiuretic hormone (ADH) (1). • ACTH hormone secreted by front lobe of pituitury gland. • TSH	**3** **AO1=3**

1 (e)	**Identify the structure that produces the major female reproductive hormones** and **explain the function of this structure**. Award **one** mark for correct identification: • Ovary/ovaries (1). Not stored but manufactures and develops embryo, secretion of hormone for eggs to produce here. Accept uterus accepts the development of embryo. Award up to **three marks** for an accurate explanation: • Secretes oestrogen, progesterone and androgens into the bloodstream (1). These are responsible for the maturation and maintenance of sexual organs (1) and preparing for pregnancy (1). • Produces the ovum or egg (1) and is responsible for releasing this egg for fertilisation (1). • The ageing of the ovary is thought to be significant for the onset of menopause (1) due to fluctuations in hormone production (1) and a decline in the number of egg cells (1). **NB: do not accept 'produces female reproductive hormones' without specific explanation, as this is in the question.** Accept other suitable responses.	**4** **AO1=1** **AO3=3**

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

2 (a)	**Which** one (1) **of the following is a type of neuron?** Award **one mark** for: **A** Sensory	**1** **AO1=1**

2 (b)	**Discuss the possible effects of multiple sclerosis (MS) on Ayesha's wellbeing.** Do not give points for what MS is only the effects	**12** **AO1=2** **AO2=5** **AO3=5**

Level	Mark	Description
3	**9–12**	A wide range of relevant knowledge and understanding of the impact of MS on Ayesha's wellbeing is shown, which is accurate and detailed. Application of knowledge is appropriate and accurate and shows clear understanding of the impact of MS on Ayesha's wellbeing. Analysis to demonstrate understanding of the impact of MS on Ayesha's wellbeing is detailed and highly effective, with reasoned judgements made. Clear links are made.
2	**5–8**	A wide range of relevant knowledge and understanding of the impact of MS on Ayesha's wellbeing is shown. There may be a few errors. Application of knowledge is mostly appropriate, showing some clear understanding of the impact of MS on Ayesha's wellbeing. There may be a few errors. Analysis to demonstrate understanding of the impact of MS on Ayesha'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 impact of MS on Ayesha's wellbeing is shown but is often fragmented. Application of knowledge is limited and may show a lack of understanding of the impact of MS on Ayesha's wellbeing. There may be a number of errors.

		Analysis to demonstrate understanding of the impact of MS on Ayesha's wellbeing lacks detail and may have limited effectiveness and relevance. Links may be made but are often inappropriate.
	0	No relevant material.

Indicative content

Answers may take a holistic approach or focus on the individual physical, cognitive, emotional and social aspects of Ayesha's wellbeing.
Needs to relate wellbeing,
Physical**:**

AO1
- Many of the physical effects on Ayesha are related to the failure of the nervous system in MS.
- MS could cause Ayesha a lot of pain.
- Fine and gross motor skills effected
- Diff walking, communicationg, hand tremours depression, anxiety, isolation.

AO2
- MS could cause issues with Ayesha's muscle control leading to coordination problems.
- This loss of muscle control could also cause mobility issues.

AO3
- Ayesha may develop problems with her bladder or bowels possibly leading to incontinence.
- Ayesha may have problems with her sexual functioning.

Cognitive:

AO1
- There is a 50% chance of Ayesha experiencing cognitive problems.

AO2
- Ayesha may experience problems with her memory, concentration, and attention.
- Ayesha may also experience problems regarding the speed at which she processes information, and this could slow down.

AO3
- Ayesha could experience issues with her word-finding, abstract-thinking and problem-solving.
- Ayesha could have problems with her visuo-spatial awareness.

Emotional**:**

AO1
- Ayesha could suffer anxiety and depression.

	AO2 • Ayesha could have issues with her self-image as it may take a while to adjust to physical changes. • This may have a negative impact on Ayesha's self-esteem. **AO3** • Ayesha could have lability of mood which would lead to unexpected mood changes. • Ayesha could be subject to uncontrollable bouts of laughing and crying due to changes in her brain. <u>Social</u> **AO1** • Ayesha may find it more difficult to maintain her social contacts. **AO2** • Ayesha may be unable to continue in her employment during her illness. • This could influence Ayesha's socio-economic status. **AO3** • Ayesha's relationships with her friends and family may change should she become less mobile. • Ayesha may make new friends in a supportive MS community. Accept other suitable responses. al	

2 (c)	**Identify the component of the peripheral nervous system responsible for voluntary movement** and **explain the function of this component.** Award **one mark** for: • somatic (1). Accept SMS Award up to a further **three** marks for an accurate explanation: • This system connects the central nervous system (CNS), sensory system, and muscular system (1). • Sensory (afferent) neurons are responsible for carrying information to the CNS (1). • Motor (efferent) neurons are responsible for carrying information from the CNS to muscles (1). • The somatic nervous system uses the spinal reflex arc for rapid (emergency) movements (1). Accept other suitable responses.	**4** **AO1=1** **AO3=3**

2 (d)	**Describe the structure of the spinal cord.** Award up to **three** marks for an accurate description: • A long, thin, tubular structure made up of nervous tissue (1), which extends from the medulla oblongata in the brainstem (1) to the lumbar region of the vertebral column (1). It contains cerebrospinal fluid (1). Accept other suitable responses. Such as : long thin, tubular, protects nerves, nervous tissue sinovial and not synobi	**3** **AO2=3**

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

3 (a)	**Identify** three (3) **common symptoms of asthma** and **briefly describe** one (1) **of these symptoms.** Award **one** mark for each correct identification up to **three** marks: • wheezing (1) • shortness of breath (1) • tightness in the chest (1) • coughing (1). • Increase in heart rate and diff breathing Award a further **one** mark for a brief description: • Wheezing – this is a whistling sound when breathing (1) as a result of inflammation of the tubes in the lungs (1). • Shortness of breath – inflammation in the lungs (1) reduces the amount of available air (1). • Tightness in the chest – feels like a band is tightened around the chest (1) and as a result of inflammation of the tubes in the lungs (1). • Coughing – this is the body's way of trying to remove an irritant from the lungs (1). As a result of inflammation in the tubes of the lungs (1). Accept other suitable responses.	**4** **AO1=3** **AO2=1**

3 (b)	**Discuss the possible effects of asthma on George's wellbeing.** **Level** / **Mark** / **Description** **3** / **7–9** / A range of relevant knowledge and understanding of how asthma may impact on George's wellbeing is shown, which is accurate and detailed. Application of knowledge is appropriate and accurate and shows clear understanding of how asthma may impact on George's wellbeing. Analysis to demonstrate understanding of how asthma may impact on George's wellbeing is detailed and highly effective, with reasoned judgements made. Clear links are made.			**9** **AO1=3** **AO2=3** **AO3=3**

2	**4–6**	A range of relevant knowledge and understanding of how asthma may impact on George's wellbeing is shown, but may be lacking in sufficient detail, with a few errors. Application of knowledge is mostly appropriate, showing some clear understanding of how asthma may impact on George's wellbeing. There may be a few errors. Analysis to demonstrate understanding of how asthma may impact on George's wellbeing is effective and mostly relevant with simplistic judgments made. Some clear links are made.
1	**1–3**	A range of relevant knowledge and understanding of how asthma may impact on George's wellbeing is shown but is often fragmented. Application of knowledge is limited and may show a lack of understanding of how asthma may impact on George's wellbeing. There may be a number of errors. Analysis to demonstrate understanding of how asthma may impact on George's wellbeing lacks detail and may have limited effectiveness and relevance. Links may be made but are often inappropriate.
	0	No relevant material.

Indicative content

Answers may take a holistic approach or focus on the individual physical, cognitive, emotional, and social aspects of George's wellbeing:
Life long condition, effects pies, and participation in sports and social activities, depression and anxiety, lonilness.
Physical:

AO1
- George may experience difficulties when he breathes.

AO2
- Due to breathing issues, George may be unusually tired.
- George may experience an acute phase (asthma attack).

AO3
- George may have severely limited physical activity due to severe breathing difficulties.
- This may result in a reduction of George's overall fitness

Cognitive**:**

	AO1 • George may have difficulty concentrating when his breathing is affected. **AO2** • This could affect his performance of daily activities, including school, sports activities, and work. <u>Emotional</u>**:** **AO1** • George could experience considerable emotional distress when having breathing difficulties. **AO3** • The feeling of dyspnoea during an asthma attack could leave George feeling like he is unable to breathe. <u>Social</u> **AO1** • Not being able to take part in sporting activities could lead to social isolation. **AO2** George might be reluctant to join friends due to fear of having asthma attacks **AO3** • George's parents could have limited his social activities when younger out of fear for his safety. This could result in him having fewer friends. Accept other suitable responses.	

3 (c)	**Identify the** three (3) **structures of the respiratory system that are found between the mouth and the trachea.** Award one (1) mark for each correct identification up to three (3) marks: • pharynx (1) • epiglottis (1) • larynx (1). Accept voice box	**3** **AO1=3**

3 (d)	**Identify** three (3) **functions of the respiratory system** and **briefly explain** one (1) **of these functions.** Award one (1) mark for each correct identification up to three (3) marks:	**4** **AO1=3** **AO3=1**

	• delivers oxygen into the body (1) • removes carbon dioxide from the body (1) • allows you to talk (1) • allows you to smell (1) • brings air to body temperature (1). • Intercostal muscles, expand, take oxygen away and breath out carbon dioxide. Award a further one (1) mark for a brief explanation. • Delivers oxygen into the body - oxygen is required by all the cells to live (1) this is part of gaseous exchange (1). • Removes carbon dioxide from the body – carbon dioxide is a waste product (1) from gaseous exchange in the cells (1). • Allows you to talk - the passage of air through the larynx (1) creates vibration which produces sound (1). • Allows you to smell – air passing over sensory receptors in the nose (1) produces a sense of smell (1). • Brings air to body temperature – as air passes through the respiratory system it is warmed to body temperature (1) to prevent irritation in the lungs (1). Accept other suitable responses.	

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

4 (a) **Explain the role of enzymes in chemical digestion.** **6**

AO2=3

AO3=3

Level	Mark	Description
3	**5–6**	Application of knowledge is appropriate and accurate and shows clear understanding of the role of enzymes in chemical digestion. 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.
2	**3–4**	Application of knowledge is mostly appropriate, showing some clear understanding of the role of enzymes in chemical digestion. There may be a few errors. 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.
1	**1–2**	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. 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.
	0	No creditworthy material.

Accept :- breakdon of nutrients, operate at 37, lipids, catalyst reaction from a-b without the enzymes depleating, keeps equiblibruim. constant

Indicative content

AO2

- Amylase is produced in the mouth and is present in saliva and breaks down starches into sugars.
- Protease is secreted into the stomach and duodenum and breaks down proteins into amino acids.
- Lipase is present in pancreatic secretions in the intestines and breaks down fats into fatty acids.

AO3

- The pancreas and salivary gland both make amylase to hydrolyse dietary starch, breaking it down into disaccharides and trisaccharides. These are converted by other enzymes into glucose which supplies the body with energy.

	• Protease catalyses proteolysis, which is the breakdown of proteins into smaller polypeptides/single amino acids. This is done by cleaving the peptide bonds within proteins by hydrolysis, a reaction where water breaks down bonds. • Lipase breaks down dietary fats in the digestive system and converts triglyceride substrates found in oils to monoglycerides and fatty acids. Accept other suitable responses	

4 (b)	**Chemical digestion is one type of digestion.** **Identify the** other **type of digestion.** Award one (1) mark for: • mechanical (1).	**1** **AO1=1**

4 (c)	**Identify** three (3) **organs of the alimentary canal** and **describe the function of** one (1) **of these organs.** Award one (1) mark for correct identification up to three (3) marks: • mouth (1) • pharynx (1) • oesophagus (1) • stomach (1) • small intestine (1) • large intestine (1). Award up to two (2) marks for an accurate description: • Mouth o the start of the digestive process (1). Responsible for both mechanical digestion (1) and chemical digestion (1). • Pharynx o the walls are significant for swallowing (1). Serves as a pathway for the movement of food (1) from the mouth to the oesophagus (1). • Oesophagus o a muscular tube that connects your mouth to your stomach (1). When you swallow food, the walls of the oesophagus contract (1). This moves the food down the oesophagus to the stomach (1). • Stomach o secretes hydrochloric acids and enzymes to chemically digest food (1). Has muscular walls that contract to	**5** **AO1=3** **AO2=2**

	mechanically digest food (1). The result is the production of chyme (1). • Small intestine o breaks down food through mechanical digestion (1) and chemical digestion (1). Absorbs nutrients needed for the body (1). Removes unnecessary components (1). • Large intestine o finishes absorption of nutrients and water (1). Synthesises certain vitamins (1). Forms faeces and eliminates it from the body (1). Accept other suitable responses.	

4 (d)	**Identify** and **describe the process that allows food to move through the digestive tract**. Don't accept swallowing as an answer. Award one (1) mark for correct identification and up to two marks for an accurate description: • peristalsis (1) – the symmetrical contraction and relaxation (1) of circular smooth muscles (1) that propagates in a wave down a tube (1) which transports the bolus (1).	**3** **AO1=1** **AO2=2**

4 (e)	**Identify** three (3) **structures in the urinary (excretory) system** and **explain the function of** one (1) **of these structures.** Award one (1) mark for correct identification up to three (3) marks: • kidneys (1) • ureters (1) • bladder (1) • urethra (1). Award up to two (2) marks for an accurate explanation: • Kidneys o remove waste products from the body (1). Remove excess fluids from the body (1). The waste product is called urine (1) Release hormones that regulate blood pressure (1). Regulate the production of red blood cells (1). • Ureters o remove urine from the kidneys (1). Transport urine through muscle contractions (1). Pass urine to the bladder (1). • Bladder o stores urine (1). Allows urination to be infrequent and controlled (1). When urinating, the bladder muscles contract, and two valves open to allow urine to exit the bladder (1). • Urethra	**5** **AO1=3** **AO3=2**

	o the primary function of the urethra is to transport urine from the bladder to the outside of the body (1) This allows the bladder to empty when urinating (1). The male urethra is also responsible for removing semen from the body during ejaculation (1). Accept other suitable responses.	

Assessment Objective Grid

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