



*Rewarding Learning*

**ADVANCED SUBSIDIARY (AS)  
General Certificate of Education**

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## **Health and Social Care**

Assessment Unit AS 7

*assessing*

Understanding the Physiology of Health and Illness

**[SHC71]**

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# **Assessment**

# **MARK SCHEME**

## **Additional Guidance for teachers for 2021 only**

**You will find it useful to view the EEP webinar to help you gauge the standard for this assessment.**

**Please read the general marking instructions that follow before you begin marking.**

**Some additional points that will help you use the mark scheme:**

- The questions where QWC (quality of written communication) is assessed are identified on the front cover of the paper. In all other questions on the paper QWC should not influence the marking.
- Where you see “all other valid responses will be given credit”, if you think a response which is not on the mark scheme may be correct, you should check it for accuracy and award the marks if appropriate.
- Avoid awarding marks twice for repeated points in a question.
- When a question requires a specific number of points to be given (e.g. one example, two advantages, three ways), only that number of points can achieve marks. Where a student makes more points than the number required, their best points should be selected for marking. In these types of questions, compensation may be used; this means that a correct additional point in one part of the answer can be awarded marks where another part of the answer is incorrect or blank.
- For extended responses, you need to read the level descriptors carefully to help you make a judgement. There is further advice in the general marking instructions.
- You may find it useful to annotate the responses to help you decide on and justify the marks you award.

## **General Marking Instructions**

### ***Introduction***

The main purpose of a mark scheme is to ensure that examinations are marked accurately, consistently and fairly. The mark scheme provides examiners with an indication of the nature and range of candidates' responses likely to be worthy of credit. It also sets out the criteria which they should apply in allocating marks to candidates' responses.

### ***Assessment objectives***

Below are the assessment objectives for **GCE Health and Social Care**.

Candidates should be able to:

- AO1** Demonstrate knowledge and understanding of the specified content.
- AO2** Apply knowledge, understanding and skills to a variety of health, social care and early years contexts.
- AO3** Investigate, analyse, and evaluate acquired knowledge and understanding, present arguments, make reasoned judgements and draw conclusions.

### ***Quality of candidates' responses***

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 17 or 18-year-old which is the age at which the majority of candidates sit their GCE examinations.

### ***Flexibility in marking***

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

### ***Positive marking***

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 17 or 18-year-old GCE candidate.

### ***Awarding zero marks***

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

### ***Types of mark schemes***

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication. Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

### *Levels of response*

In deciding which level of response to award, examiners should look for the ‘best fit’ bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement.

The following guidance is provided to assist examiners.

- **Threshold performance:** Response which just merits inclusion in the level and should be awarded a mark at or near the bottom of the range.
- **Intermediate performance:** Response which clearly merits inclusion in the level and should be awarded a mark at or near the middle of the range.
- **High performance:** Response which fully satisfies the level description and should be awarded a mark at or near the top of the range.

### *Quality of written communication*

Quality of written communication is taken into account in assessing candidates’ responses to all tasks and questions that require them to respond in extended written form. These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response as follows:

Level 1: Quality of written communication is basic.

Level 2: Quality of written communication is adequate.

Level 3: Quality of written communication is competent.

Level 4: Quality of written communication is highly competent.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided below:

**Level 1 (Basic):** The candidate makes only a limited attempt to select and use an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

**Level 2 (Adequate):** The candidate makes a reasonable attempt to select and use an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

**Level 3 (Competent):** The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is extensive and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard and ensure that meaning is clear.

**Level 4 (Highly competent):** The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is extremely well organised with the highest degree of clarity and coherence. There is extensive and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of the highest standard and ensure that meaning is absolutely clear.

- 1 (a) Write down the name and state **one** function of the organelles labelled A, B,C and D. (AO1, AO2)

**A** Name: smooth endoplasmic reticulum (SER)  
Function: lipid synthesis  
[1] for name; [1] for function

**B** Name: vesicle  
Function: transports protein and lipids in cell  
[1] for name; [1] for function

**C** Name: rough endoplasmic reticulum (RER)s  
Function: synthesise protein  
[1] for name; [1] for function

**D** Name: nucleus/nuclear membrane  
Function: contains the genetic material/controls what enters and leaves nucleus  
[1] for name; [1] for function  
(8 × [1]) [8]

- (b) Describe how this structure speeds up the electrical transmission along the neurone. (AO1, AO2)

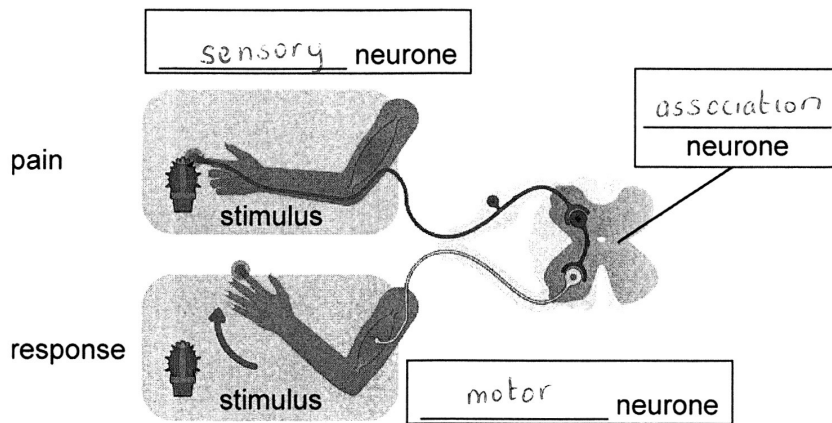
The Schwann cells that make up the myelin sheath act as an insulator, preventing the movement of the electrical impulse across the axon membrane. The impulse is forced to jump from node to node. This is called saltatory conduction and is very fast.  
[1] basic description [2] adequate description [3] competent description  
(1 × [3]) [3]

- (c) Complete the table below to give the name, function or area of the body where the tissue is commonly found. (AO1, AO2)

Name of tissue	Function	Area of the body where the tissue is commonly found
Cardiac Muscle	A special type of muscle that contracts without nervous stimulation	<b>HEART</b>
<b>CARTILAGE</b>	Gives strength and flexibility to skeleton	At the end of bone in joints, e.g. the knee
Adipose	<b>PROTECTION OF ORGANS/ ENERGY SOURCE/ INSULATION</b>	Around organs and beneath the skin

(3 × [1]) [3]

- (d) (i) On the diagram label the motor neurone, the association neurone and the sensory neurone. (AO1)



(3 × [1])

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[3]

- (ii) Explain why reflex responses like the one shown in the diagram are an advantage to the body. (AO1, AO2)

They are much faster as they are controlled by the spinal cord and not the brain therefore protect the body from damage.

[1] basic explanation [2] competent explanation

(1 × [2])

[2]

- (iii) Discuss the process that occurs when an impulse passes from the end of one neurone to the start of the next neurone across the synapse. (AO1, AO2, AO3)

**Examples of suitable points to be discussed:**

- the electrical impulse reaches the pre-synaptic knob/end of the first neurone
- this causes calcium ions to enter the pre-synaptic knob and bind to the vesicles
- vesicles in the presynaptic knob move towards the presynaptic membrane
- vesicles fuse with the membrane
- the neurotransmitter/acetylcholine/chemical is released from the vesicle
- the neurotransmitter/acetylcholine/chemical diffuses across the synaptic cleft/synapse
- the neurotransmitter/acetylcholine/chemical attaches to receptors on the association/relay neurone
- this causes an electrical impulse to begin in the second neurone

All other valid responses will be given credit.

[0] is awarded for a response not worthy of credit.

**Level 1 ([1]–[3])**

Overall impression: basic

- basic knowledge and understanding of the mechanism of synaptic transmission

- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- displays a limited ability to discuss the mechanism of synaptic transmission
- quality of written communication is basic. The candidate makes only a limited attempt to select and use an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

**Level 2 ([4]–[6])**

Overall impression: adequate

- adequate knowledge and understanding of the mechanism of synaptic transmission
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- displays an adequate ability to discuss the mechanism of synaptic transmission
- quality of written communication is adequate. The candidate makes a reasonable attempt to select and use an appropriate form and style of writing. Relevant material is organized with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

**Level 3 ([7]–[9])**

Overall impression: competent

- competent knowledge understanding of the mechanism of synaptic transmission
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- displays a competent ability to discuss the mechanism of synaptic transmission
- quality of written communication is competent. The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organized with a high degree of clarity and coherence. There is extensive and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard and ensure that the meaning is clear.

[9]

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2 (a) (i) Write down the names of parts **A**, **B** and **C**. (AO1)

**A**: cerebrum

**B**: thalamus

**C**: pituitary gland

(3 × [1])

[3]

(ii) The brain and which other structure make up the central nervous system? (AO1)

- spinal cord

(1 × [1])

[1]

(b) Discuss the physiological cause of MS. (AO1, AO2, AO3)

**Examples of suitable points to be discussed:**

- the body's immune system attacks the myelin sheath mistaking it as a 'foreign body'
- this damages the myelin, stripping it of fibres leaving scars known as lesions or plaques
- a hole develops in the myelin sheath
- plaques form over the hole
- this reduces the electrical conductivity of the axon
- impulse can be slowed down or prevented from travelling along the axon

All other valid responses will be given credit.

[0] is awarded for a response not worthy of credit.

**Level 1 ([1]–[2])**

Overall impression: basic

- basic knowledge and understanding of the physiological cause of MS
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- displays a limited ability to discuss the physiological cause of MS.

**Level 2 ([3]–[4])**

Overall impression: adequate

- adequate knowledge and understanding of the physiological cause of MS
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- displays an adequate ability to discuss the physiological cause of MS.

**Level 3 ([5]–[6])**

Overall impression: competent

- competent knowledge and understanding of the physiological cause of MS
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- displays a competent ability to discuss the physiological cause of MS.

[6]

- (c) Assess how MS may affect Sam's work, income and relationships. (AO1, AO2, AO3)

Examples of suitable points to be assessed:

**Work:** Sam may no longer be able to cut hair but as MS is a progressive disease this is not likely to happen immediately. As Sam is a hair stylist she will be able to continue to do other things, e.g. hair colouring. Sam may eventually require a wheelchair and may not be able to stand to work with clients. Sam could take up a different role in the business such as manager doing tasks that are less dependent on her dexterity or mobility.

**Income:** Sam may eventually lose some of the income she gets from her work with clients, however as Sam is an employer in the salon she should be able to maintain some income from her employees. As Sam's MS progresses she will be entitled to state benefits which will boost her income.

**Relationships:** Sam should be able to continue working for some time therefore her relationship with her employees should remain strong or they may weaken if her employees leave because they are concerned about their futures. Her clients may be very supportive of her. Sam may get support from her colleagues and may feel closer to them. Sam is a single mother and may be anxious about how her disease will impact on her relationship with her children. Sam's condition may put a strain on the relationship with her children, or they may become closer. She may rely more on her siblings and parents so those relationships could also become strained or alternatively become closer.

All other valid responses will be given credit.

[0] is awarded for a response not worthy of credit.

### Level 1 ([1]–[4])

Overall impression: basic

- basic knowledge and understanding of how MS will impact on work, income, and relationships
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- displays a limited ability to assess the impact of how MS will impact on work, income, and relationships
- candidates addressing only one area of lifestyle cannot achieve beyond this level
- quality of written communication is basic. The candidate makes only a limited attempt to select and use an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

### Level 2 ([5]–[8])

Overall impression: adequate

- adequate knowledge and understanding of how MS will impact on work, income, and relationships
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question

- displays an adequate ability to assess how MS will impact on work, income, and relationships
- addressing only two aspects of lifestyle cannot achieve beyond this level
- quality of written communication is adequate. The candidate makes a reasonable attempt to select and use an appropriate form and style of writing. Relevant material is organized with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

### Level 3 ([9]–[12])

Overall impression: competent

- competent knowledge and understanding of how MS will impact on work, income, and relationships
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- displays a competent ability to assess how MS will impact on work, income, and relationships
- candidates addressing all three aspects of lifestyle competently can achieve at the top of this level
- quality of written communication is competent. The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organized with a high degree of clarity and coherence. There is extensive and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard and ensure that the meaning is clear. [12]

- (d) (i) Describe the difference between these two main types of stroke. (AO1, AO2)

A haemorrhagic stroke occurs when a blood vessel in the brain becomes stretched or thin and bursts making blood leak out of the vessel and preventing an area of the brain from getting oxygen or food.

An ischaemic stroke occurs when a blood vessel becomes blocked by fatty deposits and blood can no longer flow past this point meaning tissue is starved of food and oxygen.

[1] basic description [2] adequate description [3] full description

(1 × [3])

[3]

- (ii) Write down two signs or symptoms that someone may experience when having a stroke. (AO1, AO2)

Any **two** from:

- slurred speech
- facial drooping
- inability to raise arms and keep them there
- numbness in arms, legs or face
- blurred vision
- confusion

All other valid responses will be given credit.

(2 × [1])

[2]

- (e) Discuss how these two systems work together to control the amount of water in the blood (osmoregulation). (AO1, AO2, AO3)

**Examples of suitable points to be discussed:**

- osmoreceptors in the hypothalamus detects low concentration of water in the blood
- the hypothalamus stimulates thirst receptors to make the person want to drink fluid
- hypothalamus sends messages to the pituitary gland to increase the release of ADH
- ADH travels to the kidney via the blood
- more ADH affects the permeability of the collecting duct in the kidney nephron, making it more permeable
- more water is reabsorbed and urine becomes more concentrated
- water balance is returned to normal
- osmoreceptors in the hypothalamus detect the high concentration of water in the blood
- thirst receptors are no longer stimulated
- the hypothalamus sends messages to the pituitary gland to decrease the release of ADH
- less ADH travels to the kidney via the blood
- less ADH affects the permeability of the collecting duct in the kidney nephron, making it less permeable
- less water is reabsorbed
- urine becomes less concentrated
- water balance returns to normal

All other valid responses will be given credit.

[0] is awarded for a response not worthy of credit.

**Level 1 ([1]–[4])**

Overall impression: basic

- basic knowledge and understanding of the interrelationship between the nervous system and the endocrine system in osmoregulation
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- displays a limited ability to discuss the interrelationship between the nervous system and the endocrine system in osmoregulation
- quality of written communication is basic. The candidate makes only a limited attempt to select and use an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

**Level 2 ([5]–[8])**

Overall impression: adequate

- adequate knowledge and understanding of the interrelationship between the nervous system and the endocrine system in osmoregulation
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- displays an adequate ability to discuss the interrelationship between the nervous system and the endocrine system in osmoregulation

- quality of written communication is adequate. The candidate makes a reasonable attempt to select and use an appropriate form and style of writing. Relevant material is organized with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

**Level 3 ([9]–[12])**

Overall impression: competent

- competent knowledge and understanding of the interrelationship between the nervous system and the endocrine system in osmoregulation
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- displays a competent ability to discuss the interrelationship between the nervous system and the endocrine system in osmoregulation
- quality of written communication is competent. The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organized with a high degree of clarity and coherence. There is extensive and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard and ensure that the meaning is clear. [12]

AVAILABLE  
MARKS

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- 3 (a) Write down the name and **one** function in digestion of the parts labelled **A**, **B** and **C**. (AO1, AO2)

**A** Name: pancreas

Function in digestion: releases digestive enzymes

[1] for name [1] for function

**B** Name: small intestine

Function in digestion : releases enzymes into small intestine to complete digestion

[1] for name [1] for function

**C** Name: gall bladder

Function in digestion: stores bile needed for emulsification of fats

[1] for name [1] for function

(6 × [1])

[6]

- (b) (i) Complete the paragraph below to show how blood glucose levels are controlled (AO1, AO2)

After a meal blood glucose levels rise. This rise is detected by organ A. The organ then releases the hormone **INSULIN** which travels to the **LIVER** and reduces the amount of blood glucose by converting the glucose to **GLYCOGEN**. The hormone also increases the uptake of glucose by cells and increases the rate of respiration. After some time, the blood glucose levels will begin to fall below normal as all the available glucose has been used up in respiration. Organ A will then release a second hormone called **GLUCAGON**. This causes the stored glycogen to be broken back down into glucose. The glucose is then released from the liver into the **BLOOD** and carried to the cells in the body where it is needed.

(5 × [1])

[5]

- (ii) Complete the sentence below. (AO1)

The normal level of blood glucose is between **4 mmol/dm<sup>3</sup>** and **5.9 mmol/dm<sup>3</sup>** (also accept 7 mmol/dm<sup>3</sup>)

(2 × [1])

[2]

- (c) (i) Describe how a stomach ulcer develops. (AO1)

The stomach either begins producing excess acid or there is a depletion in the amount of mucus produced. The acid then attacks the lining of the stomach causing a hole to form.

[1] basic description [2] adequate description [3] competent description

(1 × [3])

[3]

- (ii) Suggest how John may have to adapt his diet. (AO1, AO2)

John may need to eat more foods that help to fight any infection in the ulcer such as carrots, broccoli, blueberries etc. He may also need to avoid foods that might irritate the ulcer and cause pain such as fizzy drinks, pickles, very spicy or fatty foods.

[1] basic suggestions [2] adequate suggestions [3] competent suggestions

(1 × [3])

[3]

- (iii) Explain how having a stomach ulcer may impact on John's work. (AO1, AO2)
- It is unlikely that John would require a long period of time off work. He may, however, need some time off if he is in pain.  
[1] basic explanation [2] competent explanation  
(1 × [2]) [2]
- (d) Write down the name of the structure labelled X in the photograph and give its function. (AO1, AO2)
- Name: villi/microvilli  
Function: increases the surface area for absorption of food.  
[1] for name [1] for function  
(2 × [1]) [2]
- (e) (i) Explain why it is important that excess amino acids are deaminated in the liver. (AO2)
- Amino acids cannot be stored in the body and their build up can lead to toxicity in the body.  
[1] basic explanation [2] competent explanation  
(1 × [2]) [2]
- (ii) Describe how amino acids are deaminated in the liver. (AO1, AO2)
- Examples of suitable points to be included in description:**
- the amino group is removed from the amino acid and converted to ammonia
  - the rest of the molecule is converted to useful carbohydrates
  - the ammonia is converted into urea (excreted via the kidneys) and the carbohydrate is stored in the liver
- [1] basic description [2] adequate description [3] competent description  
(1 × [3]) [3]
- (f) (i) Outline the physiological cause of cirrhosis of the liver. (AO1)
- Damage to the liver causes it to produce collagen fibres within the liver cells, preventing them from working. Over time, these fibres called fibrosis affect more and more of the liver tissue and eventually the scarring they cause begins to reduce the ability of the liver to function. When the scar tissue is formed it can block the flow of substances between the blood and the liver.  
[1] basic outline [2] adequate outline [3] full outline  
(1 × [3]) [3]
- (ii) Explain why someone who has cirrhosis of the liver should avoid alcohol. (AO2)
- The liver can no longer adequately process alcohol due to the scarring. The alcohol therefore builds up in the person's system and acts as a poison.  
[1] basic explanation [2] competent explanation  
(1 × [2]) [2]

**Total**

AVAILABLE  
MARKS

33

**100**





