



*Rewarding Learning*

**ADVANCED SUBSIDIARY (AS)  
General Certificate of Education  
2023**

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**Nutrition and Food Science**

**Assessment Unit AS 2**

*assessing*

**Diet, Lifestyle and Health**

**[SNF21]**

**TUESDAY 30 MAY, MORNING**

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**MARK  
SCHEME**

## **General Marking Instructions**

### ***Introduction***

The main purpose of the 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 Nutrition and Food Science.

Candidates should be able to demonstrate:

- AO1** knowledge and understanding of the specified content
- AO2** the ability to apply knowledge, understanding and skills in a variety of situations and to analyse problems, issues and situations using appropriate skills
- AO3** the ability to gather, organise and select information, evaluate acquired knowledge and understanding, and present and justify an argument

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

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity that may reasonably be expected of a 17 or 18-year-old, 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 the 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 makes a good attempt to select and use an appropriate form and style of writing. Relevant material is organised with a good degree of clarity and coherence. There is widespread use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

**Level 4 (Highly competent):** The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is succinct, well organised and displays a high 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.

Section A

AVAILABLE  
MARKS

1 (a) State the number of kilocalories in 1 g of alcohol. (AO1)

- 1 g of alcohol has 7 kcals [1]

(b) Explain how alcohol affects blood glucose levels. (AO1, AO2)

- alcohol is a toxin and makes the control of blood glucose levels more difficult, insulin production is affected
- alcohol is high in carbohydrates raising blood glucose levels, the pancreas becomes inflamed and is unable to produce sufficient hormones to regulate glucose levels
- excessive alcohol consumption may increase insulin secretion leading to low blood sugar

All other valid points will be given credit

[0]–[2] basic explanation

[3] competent explanation

[4] highly competent explanation [4]

(c) 'Drinking alcohol at any stage during pregnancy can cause harm to your baby.' Consider this statement. (AO1, AO2, AO3)

- experts are unsure exactly how much alcohol is completely safe to have during pregnancy so the safest approach is to not drink at all to keep risks to the baby to a minimum
- drinking alcohol, especially in the first three months of pregnancy increases the risk of miscarriage, premature birth and low birthweight
- drinking after the first three months could increase the risk of learning difficulties and behavioural problems
- risks are greater when alcohol consumption is high and drinking heavily throughout pregnancy can cause a serious condition called fetal alcohol syndrome

All other valid points will be given credit

[0]–[2] basic consideration

[3]–[4] competent consideration

[5] highly competent consideration [5]

10

2 (a) Identify **three** health problems associated with obesity in childhood. (AO1)

- Type 2 diabetes
- Low confidence or self-esteem which may lead to depression
- Joint problems and musculoskeletal discomfort

All other valid points will be given credit

[3]

(b) Suggest **three** ways parents can help their child achieve a healthy weight. (AO1, AO2, AO3)

- children learn by example and one of the most effective ways to encourage a child to be active and eat well is for parents to do so themselves. Changes to diet and lifestyle are more likely to be accepted if the changes are small and involve the whole family
- avoid serving large portions of food to children. Eating large portions can become a habit and provides unnecessary calories. Start meals with small servings and allow children to ask for more if they are still hungry
- encourage daily physical activity and limit the amount of time the child spends on inactive pastimes such as watching television, playing video games and playing on electronic devices. Sitting or lying around too much leads to weight gain

All other valid points will be given credit

[0]–[2] basic suggestions

[3]–[4] competent suggestions

[5]–[6] highly competent suggestions

[6]

AVAILABLE  
MARKS

9

3 (a) Describe **two** ways food advertising can prevent consumers from making healthy food choices. (AO1, AO2)

- celebrity endorsements and cartoon characters are used to advertise foods high in fats, sugar and salt; these repeated messages encourage consumers to make less healthy food choices
- misleading health claims persuade consumers to make unhealthy food choices, e.g. ultra processed food, foods high in fat, sugar or salt

All other valid points will be given credit

[0]–[1] basic description

[2]–[3] competent description

[4] highly competent description

[4]

(b) Explain how employment patterns may contribute to poor eating habits. (AO1, AO2, AO3)

- individuals working from home may snack frequently due to accessibility of foods or may not eat sufficiently due to work commitments
- long working hours and shift work patterns can lead to increased consumption of ready meals or take away food for convenience
- those with long commute times may skip breakfast and choose to eat on the move, possibly on snack foods or foods with poor nutritional value
- long working hours can mean more disposable income but less time available. Households may choose to spend more on meals outside the home that are more energy dense

All other valid points will be given credit

[0]–[2] basic explanation

[3]–[4] competent explanation

[5]–[6] highly competent explanation

[6]

AVAILABLE  
MARKS

10

4 Discuss the benefits of fruit in the management of Type 2 diabetes. (AO1, AO2, AO3)

- the sugar in fruit is intrinsic rather than free sugar which is important to help manage diabetes as it avoids a sharp rise in blood glucose levels
- a portion of fruit generally has a low to medium glycaemic index which helps manage blood glucose levels in the long term as it does not lead to a sharp rise in blood glucose
- whole fruit contains fibre which helps control blood sugar levels when managing Type 2 diabetes. The soluble fibre found in the skin of fruit slows the absorption of sugar and provides satiety
- fruit is low in calories, which assists with weight management and avoids insulin resistance

All other valid points will be given credit

[0]–[2] basic discussion

[3]–[4] competent discussion

[5]–[6] highly competent discussion

[6]

**Section A**

**AVAILABLE  
MARKS**

6

**35**

## Section B

AVAILABLE  
MARKS

Quality of written communication is assessed in this section.

Answer **three** questions from this section.

- 5 Explore some of the health benefits associated with regular physical activity for adults. (AO1, AO2, AO3)

### Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of the health benefits associated with regular physical activity for adults
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explore some of the health benefits associated with regular physical activity for adults
- quality of written communication is basic

### Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of the health benefits associated with regular physical activity for adults
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explore some of the health benefits associated with regular physical activity for adults
- quality of written communication is adequate

### Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of the health benefits associated with regular physical activity for adults
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explore some of the health benefits associated with regular physical activity for adults
- quality of written communication is competent

### Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of the health benefits associated with regular physical activity for adults
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explore some of the health benefits associated with regular physical activity for adults
- quality of written communication is highly competent

### Examples of suitable points to be explored by the candidate:

- improves heart health; physical activity strengthens the heart muscle, improves blood circulation and lowers blood pressure. It also improves blood lipid profile by increasing HDL cholesterol levels
- lowers the risk of Type 2 diabetes; physical activity helps improve effectiveness of insulin leading to improved blood glucose control.

It improves the ability of fat cells to respond to insulin, known as insulin sensitivity

- reduces the risk of cancer; adults who are more active have lower rates of colon cancer and breast cancer
- controls body weight; adults who are more physically active burn more calories therefore achieving energy balance; they have a healthier body mass and composition by completing aerobic activity
- improves mental health and well-being; regular physical activity by adults helps ease anxiety, stress and depression by releasing feel good hormones, endorphins, enhancing sense of well-being; the social aspect with colleagues/friends helps promote a positive work/life balance and manages stress and anxieties
- improves bone and joint health; weight bearing activities promote increases in bone density and enhances skeletal muscle mass and strength, it helps to prevent osteoporosis in later life, physical activity also helps in the lubrication of the joints. Active adults are likely to have less risk of hip or vertebral fractures and it minimises a decrease in hip and spine bone mineral density
- improves sleep; moderate activity increases sleep quality and decreases time adults lie awake during the night, sleep decreases fatigue as adults are more alert during the day

All other valid points will be given credit

[15]

AVAILABLE  
MARKS

15

- 6 Propose and justify lifestyle recommendations to reduce the risk of cancer in adult women. (AO1, AO2, AO3)

AVAILABLE  
MARKS

**Mark Band ([0]–[3])**

Overall impression: basic

- inadequate knowledge and understanding of cancer risks in adult women
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to propose and justify lifestyle recommendations to reduce the risk of cancer in adult women
- quality of written communication is basic

**Mark Band ([4]–[7])**

Overall impression: adequate

- adequate knowledge and understanding of cancer risks in adult women
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to propose and justify lifestyle recommendations to reduce the risk of cancer in adult women
- quality of written communication is adequate

**Mark Band ([8]–[11])**

Overall impression: competent

- competent knowledge and understanding of cancer risks in adult women
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to propose and justify lifestyle recommendations to reduce the risk of cancer in adult women
- quality of written communication is competent

**Mark Band ([12]–[15])**

Overall impression: highly competent

- highly competent knowledge and understanding of cancer risks in adult women
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to propose and justify lifestyle recommendations to reduce the risk of cancer in adult women
- quality of written communication is highly competent

**Examples of suitable points to be proposed and justified by the candidate**

**Do not smoke or give up smoking:**

- cigarette smoke contains cancer causing chemicals which can damage DNA causing cancer cells to grow and multiply. Smoking is a risk factor for lung cancer, bowel cancer, womb cancer and cervical cancer in women

**Maintain a healthy weight:**

- being overweight increases the risk of breast cancer, bowel cancer, womb cancer, ovarian cancer and cervical cancer. These are all common cancers in women
- storing too much body fat can lead to insulin resistance which encourages the body to produce certain hormones. High levels of these hormones, over a long period of time, can promote the growth of cancer cells

**Be physically active:**

- a regular routine of physical activity can help maintain a healthy weight. Regular physical activity helps to lower insulin resistance and helps keep hormones at a healthy level. High levels of some hormones can increase cancer risk

**Adhere to the guidelines for alcohol consumption:**

- alcohol increases the amount of oestrogen in the blood. This is a risk factor for hormone related cancers
- alcohol contains ethanol which is converted into acetaldehyde. This is a toxic substance that damages cells and increases the risk of breast cancer

**Protect skin from ultra-violet light:**

- ultra-violet light from the sun and/or sunbeds can cause skin cancer. It lowers the immune function of the skin with pre-cancerous cells evident in skin lesions

**Breastfeed**

- breastfeeding can reduce the risk of breast cancer for the mother by lowering the levels of some cancer-related hormones in the body and helping to remove any cells in the breasts that may have DNA damage

**Minimise hormone replacement therapy (HRT) use:**

- taking oestrogen-only HRT is a risk factor for womb cancer. Menopausal symptoms may be improved by losing weight, stopping smoking, not drinking alcohol or cutting down and staying active

All other valid points will be given credit

[15]

15

AVAILABLE  
MARKS

7 Discuss **three** factors that affect energy expenditure. (AO1, AO2, AO3)

AVAILABLE  
MARKS

**Mark Band ([0]–[3])**

Overall impression: basic

- inadequate knowledge and understanding of factors that affect energy expenditure
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss **three** factors that affect energy expenditure
- quality of written communication is basic

**Mark Band ([4]–[7])**

Overall impression: adequate

- adequate knowledge and understanding of factors that affect energy expenditure
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss **three** factors that affect energy expenditure
- quality of written communication is adequate

**Mark Band ([8]–[11])**

Overall impression: competent

- competent knowledge and understanding of factors that affect energy expenditure
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to discuss **three** factors that affect energy expenditure
- quality of written communication is competent

**Mark Band ([12]–[15])**

Overall impression: highly competent

- highly competent knowledge and understanding of factors that affect energy expenditure
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to discuss **three** factors that affect energy expenditure
- quality of written communication is highly competent

**Examples of suitable points to be discussed by the candidate:**

**Lifestage**

- infant/adolescent; energy is required to facilitate the additional energy expended during primary and secondary growth spurts
- young children have higher relative metabolic rate and expend more energy as they are more active and growing rapidly
- older people expend less energy as there is a decrease in physical activity and a reduction in lean body mass
- pregnancy and lactating mothers; the growing foetus in the last trimester and production of breast milk increases energy expenditure

**Body size and gender**

- men expend more energy than women because they tend to have a larger overall body size
- larger bodies expend more energy to keep warm and large muscles expend more energy for movement than smaller body frames
- lean body tissue; muscle is an active tissue compared to fat leading to an increased energy expenditure, muscle helps the body to convert food into energy for expenditure maintaining a lean body tissue

**Activity level**

- physical activity is an important component of daily energy expenditure. Many different types of activity contribute to this, e.g. household chores, leisure-time, transport (walking or cycling to work) and sport
- sedentary occupations expend less energy as individuals are inactive whereas very active occupations expend more energy due to physical exertion
- physical activity levels; athletes who train for long periods of time will expend more energy. Some activities expend more calories than others because they exercise the muscles more and require the body to work harder

All other valid points will be given credit

[15]

**AVAILABLE  
MARKS**

15

8 Explain how the factors listed below may contribute to cardiovascular disease.  
(AO1, AO2, AO3)

- smoking
- low antioxidant status
- low intake of soluble fibre.

**Mark Band ([0]–[3])**

Overall impression: basic

- inadequate knowledge and understanding of how the listed factors may contribute to cardiovascular disease
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how smoking, low antioxidant status and low intake of soluble fibre may contribute to cardiovascular disease
- quality of written communication is basic

**Mark Band ([4]–[7])**

Overall impression: adequate

- adequate knowledge and understanding of how the listed factors may contribute to cardiovascular disease
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how smoking, low antioxidant status and low intake of soluble fibre may contribute to cardiovascular disease
- quality of written communication is adequate

**Mark Band ([8]–[11])**

Overall impression: competent

- competent knowledge and understanding of how the listed factors may contribute to cardiovascular disease
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how smoking, low antioxidant status and low intake of soluble fibre may contribute to cardiovascular disease
- quality of written communication is competent

**Mark Band ([12]–[15])**

Overall impression: highly competent

- highly competent knowledge and understanding of how the listed factors may contribute to cardiovascular disease
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how smoking, low antioxidant status and low intake of soluble fibre may contribute to cardiovascular disease
- quality of written communication is highly competent

AVAILABLE  
MARKS

**Examples of suitable points to be explained by the candidate:**

**Smoking**

- damaged arteries; smoking cigarettes makes the walls of the arteries sticky causing fatty material to stick to them, this may cause a heart attack if the narrowed arteries to the heart do not allow blood flow or a stroke if the arteries carrying blood to the brain are damaged
- harmful chemicals; carbon monoxide prevents blood cells from carrying oxygen around the body and increases heart disease. Nicotine increases the heart rate and blood pressure which are risk factors for cardiovascular disease

**Low antioxidant status**

- free radical damage; low intake of antioxidant nutrients, vitamin A, C and E increases cardiovascular risk as the oxidative damage by free radicals causes accumulation of cholesterol in the arteries
- reduced anti-inflammatory effect; low intake of phytochemicals or antioxidant nutrients may increase inflammation in the blood vessels causing build up of plaque or clots reducing blood flow to the heart

**Low soluble fibre intake**

- increased total and LDL cholesterol; a diet low in soluble fibre, e.g. oats, beans, nuts and fruit can increase cardiovascular disease as it causes a build-up of low density lipoprotein in the liver which is carried and deposited in the arteries causing atherosclerosis
- weight management; foods high in soluble fibre have a high satiety value helping to manage weight. If these foods are not consumed weight is gained which is a contributing factor to cardiovascular disease

All other valid points will be given credit

[15]

15

**Section B**

**45**

**Total**

**80**

**AVAILABLE MARKS**