



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2013**

Home Economics

Assessment Unit AS 1

assessing

Nutrition for Optimal Health

[AN111]

FRIDAY 24 MAY, MORNING

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

Section A

AVAILABLE
MARKS

- 1** Phytates interfere with the absorption of certain minerals. State **three** examples of these minerals. (AO1)
- calcium
 - iron
 - zinc
- All other valid points will be given credit [3] 3
- 2** Identify **two** significant food sources for each of the following: (AO1, AO2)
- Soluble NSP
- oats, rye, barley, pulses, fruit, vegetables
- Insoluble NSP
- wheat, maize, brown rice, fruit and vegetables, wholemeal bread, wholegrain breakfast cereals, nuts, seeds
- All other valid points will be given credit [4] 4
- 3** Identify and explain the rationale for the current dietary guidelines regarding trans fatty acids in the diet. (AO1, AO2)
- intake of trans fatty acids is recommended to be no more than 2% of food energy
 - can have similar adverse effects on health as saturates as they raise LDL and total cholesterol and reduce HDL cholesterol in the blood increasing the risk of heart disease; also increases blood triglycerides
- All other valid points will be given credit [4] 4
- 4** Justify the advice you would give to prevent dehydration in an active sports person. (AO1, AO2)
- take fluids, before, during and after exercise, as dehydration of as little as 2% of body weight lost as water, can impair performance
 - the amount of fluid may also need to increase depending on the type or intensity of the sport and the climatic conditions at the time
 - plain water is suitable for replacing any lost fluids following mild or moderate exercise, but research has demonstrated that water alone is not the best solution for fluid replacement during or after vigorous or prolonged exercise. Drinks that are specially prepared for this purpose contain carbohydrates (often glucose) and sodium to replace sodium lost in sweat
- All other valid points will be given credit [5] 5

5 What is the difference between high biological value protein and low biological value protein? Give one example of a food providing each type. (AO1, AO2)

- high biological value; when a protein contains the indispensable amino acids in a proportion similar to that required by humans, we say that it has high biological value
- low biological value; when one or more indispensable amino acids are limiting, the protein is said to have low biological value
- HBV sources; meat, poultry, fish, eggs, milk, cheese, yogurt and soya (one plant exception)
- LBV sources; pulses, grains, nuts, seeds and vegetables

All other valid points will be given credit

[5]

5

- 6 Evaluate the use of vitamin D supplements across the lifespan. (AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of vitamin D as a supplement
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to evaluate the use of vitamin D supplements across the lifespan
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of vitamin D as a supplement
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to evaluate the use of vitamin D supplements across the lifespan
- quality of written communication is reasonable to good

Mark Band ([6]–[8])

Overall impression: very good to highly competent

- clear knowledge and understanding of vitamin D as a supplement
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to evaluate the use of vitamin D supplements across the lifespan
- quality of written communication is very good to highly competent

Examples of suitable points to be evaluated by the candidate:

Pros

- infants; premature infants have a particularly high requirement for vitamin D
- children; low levels of vitamin D are found in formula milk and weaning diet, not enough exposure to the sun or excessive use of sunscreen can also reduce skin synthesis of this vitamin
- adults; during a winter pregnancy, those who live in the northern latitudes, or of Asian origin may have less sun exposure; a high alcohol intake may result in vitamin D being excreted by adults
- older people; being housebound or institutionalised may result in not getting enough vitamin D exposure, the efficiency of vitamin D synthesis in skin declines with age as the skin becomes thinner and contains less of the vitamin D precursor

Cons

- toxic; excess vitamin D in supplement form is toxic, the margin of safety with vitamin D is low and therefore raised blood calcium may occur with regular intake

All other valid points will be given credit

[8]

8

- 7 Explain the functions of carbohydrate as a nutrient in the body. (AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of the functions of carbohydrate as a nutrient in the body
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain the functions of this nutrient in the body
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the functions of carbohydrate as a nutrient in the body
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to explain the functions of this nutrient in the body
- quality of written communication is reasonable to good

Mark Band ([6]–[8])

Overall impression: very good to highly competent

- clear knowledge and understanding of the functions of carbohydrate as a nutrient in the body
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to explain the functions of this nutrient in the body
- quality of written communication is very good to highly competent

Examples of suitable points to be explained by the candidate:

- energy; glucose is oxidised in the cells and broken down in a series of reactions and energy is released providing 17kJ of energy per g
- storage of energy; glycogen is stored in the liver and muscles as a readily available reserve of carbohydrate; when glycogen stores are full, further excesses are converted into fat and stored all over the body in the fatty cells of the adipose tissue
- protein sparing; a moderate carbohydrate intake ensures that most of the dietary protein can be used for growth purposes
- dietary fibre; unavailable carbohydrates, i.e. those not broken down by digestive enzymes, give bulk to the faeces

All other valid points will be given credit

[8]

8

8 Consider the role of micronutrients in maintaining good bone health in the body. (AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of micronutrients in relation to good bone health in the body
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to consider the role of micronutrients in maintaining good bone health in the body
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of micronutrients in relation to good bone health in the body
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to consider the role of micronutrients in maintaining good bone health in the body
- quality of written communication is reasonable to good

Mark Band ([6]–[8])

Overall impression: very good to highly competent

- clear knowledge and understanding of micronutrients in relation to good bone health in the body
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to consider the role of micronutrients in maintaining good bone health in the body
- quality of written communication is very good to highly competent

Examples of suitable points to be considered by the candidate:

- calcium; is the most prevalent mineral present in the bones of an adult, together with phosphorus, it plays an essential part in hardening the skeleton
- phosphorus; is present as phosphate and is the second major mineral in bone, depletion of phosphate can result in poor mineralisation
- vitamin D; this is essential in the regulation of calcium balance and a deficiency will result in inadequate bone mineralisation, resulting in rickets and osteomalacia
- vitamin K: vitamin K is required for the correct mineralisation of bone, some evidence suggests low vitamin K levels lead to low bone density and increased risk of fractures in older people

All other valid points will be given credit

[8]

8

Section A

45

Section B

AVAILABLE
MARKS

- 9 (a) Outline the health risks for adults of binge drinking. (AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of the health risks for adults of binge drinking
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to outline these health risks
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the health risks for adults of binge drinking
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to outline these health risks
- quality of written communication is reasonable to good

Mark Band ([8]–[10])

Overall impression: very good to highly competent

- clear knowledge and understanding of the health risks for adults of binge drinking
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to outline these health risks
- quality of written communication is very good to highly competent

Examples of suitable points to be outlined by the candidate:

- damage to brain; alcohol impairs activity in the brain receptors responsible for memory and learning; it switches off the part of the brain which controls judgement, leading to high risk behaviours, which in turn can result in accidents and death
- liver failure; binge drinking causes alcoholic hepatitis and cirrhosis, the liver plays a central role in many essential body functions and when scarred, it cannot function like healthy tissue
- heart disease and obesity; consuming alcohol exceeding the benchmark may increase the risk of heart disease and obesity in later life
- cancer; increased risk of mouth, pharynx, oesophagus and cirrhosis of the liver can cause liver cancer for both genders; women are more at risk of breast cancer and men at greater risk of colon cancer

- infertility; drinking heavily can affect fertility and drinking alcohol when pregnant can seriously damage the development of the unborn baby
- poor mental health; alcohol is a depressant, linked to depression, anxiety and suicide

All other valid points will be given credit [10]

(b) Explain how the following foods could help promote a healthy diet for an adult:

- oily fish;
- fruit and vegetables and
- soya bean products

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the health benefits of oily fish, fruit and vegetables and soya bean products
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how these foods could help promote a healthy diet for an adult
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the health benefits of oily fish, fruit and vegetables and soya bean products
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to explain how these foods could help promote a healthy diet for an adult
- quality of written communication is reasonable to good

Mark Band ([11]–[15])

Overall impression: very good to highly competent

- clear knowledge and understanding of the health benefits of oily fish, fruit and vegetables and soya bean products
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to explain how these foods could help promote a healthy diet for an adult
- quality of written communication is very good to highly competent

Examples of suitable points to be explained by the candidate:

Oily fish

- source of Omega 3; fatty acids DHA and EPA may reduce the risk of a fatal heart attack by decreasing the tendency of the blood to clot; Omega 3 fatty acids are believed to assist with the treatment of inflammatory conditions such as rheumatoid arthritis
- source of vitamins A and D; necessary for good eye and bone health for this age group
- source of protein; high quality, easily digested for this age group

Fruit and vegetables

- source of antioxidants; beta carotene, C and E have an antioxidant role in preventing certain dietary cancers and heart disease; higher risk at this life stage
- lycopene; a carotenoid abundant in red fruits such as watermelon and tomatoes; adult men with lower intakes of lycopene appear to have greater risks of prostate cancer
- source of potassium; some fruit and vegetables such as bananas, tomatoes and avocados are a source of potassium which can have a beneficial effect on blood pressure at this life stage
- sources of NSP; which provides protection against CVD and Type 2 diabetes

Soya bean products

- source of phyto-oestrogens; these foods are reported to have a beneficial effect on bone health as they mimic the natural effect of oestrogen in the body and therefore result in a lowering of bone loss in women
- high biological value protein; soya bean products provide a source of HBV protein without the high saturated fat content associated with animal proteins, adults are advised to restrict their saturated fat intake to reduce the risk of developing cardiovascular disease, by lowering cholesterol which can thicken arterial walls
- NSP content; soya beans contain both soluble and insoluble fibre, soluble fibre may help lower serum cholesterol and control blood sugar, insoluble fibre increases stool bulk, may prevent colon cancer, and can help relieve symptoms of several digestive disorders

All other valid points will be given credit

[15]

25

- 10 (a) Discuss the possible health benefits of boosting vitamin C and the B group vitamins in the diet of older people (65+). (AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of vitamin C and the B group vitamins
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss the possible health benefits of boosting vitamin C and the B group vitamins in the diet of older people
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of vitamin C and the B group vitamins
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to discuss the possible health benefits of boosting vitamin C and the B group vitamins in the diet of older people
- quality of written communication is reasonable to good

Mark Band ([8]–[10])

Overall impression: very good to highly competent

- clear knowledge and understanding of vitamin C and the B group vitamins
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to discuss the possible health benefits of boosting vitamin C and the B group vitamins in the diet of older people
- quality of written communication is very good to highly competent

Examples of suitable points to be discussed by the candidate:

Vitamin C

- enhances iron absorption; increased risk of anaemia at this age
- promotes immune function; increases resistance to infection
- improve cognitive function; vitamin C may protect blood vessel integrity in older people
- possible role in the prevention of cataract formation by normalising metabolism in the lens of the eye.

B group vitamins

- lowers homocysteine; high levels of this amino acid have been linked with heart disease, alzheimers disease and memory loss. B₆, B₁₂ and folate can help reduce levels of this amino acid in the blood

- prevents depression; low blood levels of folate have also been linked with depression, so increasing this B vitamin may help alleviate this condition
- prevents anaemia; vitamin B₁₂ is especially important in conjunction with iron and folate for the formation of red blood cells and nerve function, older people can be vulnerable to pernicious anaemia due to a failure to produce an intrinsic factor which makes it difficult to absorb vitamin B₁₂, they may require injections to rectify this problem and ensure they are absorbing the vitamin

All other valid points will be given credit [10]

- (b) Older people are at risk of poor nutritional status due to the natural effects of ageing and other social factors.

Identify and explain some of the health problems related to diet and nutrition that older people may experience in later life. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the health problems experienced by older people
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to identify and explain some of the health problems related to diet and nutrition that older people may experience in later life
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the health problems experienced by older people
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to identify and explain some of the health problems related to diet and nutrition that older people may experience in later life
- quality of written communication is reasonable to good

Mark Band ([11]–[15])

Overall impression: very good to highly competent

- clear knowledge and understanding of the health problems experienced by older people
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to identify and explain some of the health problems related to diet and nutrition that older people may experience in later life
- quality of written communication is very good to highly competent

Examples of suitable points to be identified and explained by the candidate

- gastrointestinal disorders; constipation and diverticulitis are more common in older people due to an inadequate intake of NSP, fluids and food. The reduced secretion of acid and enzymes in the stomach also prolongs the digestion period and can result in constipation. The reduced gastric secretion can also be responsible for a lower level of intrinsic factor for B₁₂
- osteoporosis; prevention of fracture risk depends on calcium and vitamin D status, supplementation with calcium and vitamin D is recommended, low protein intakes are also associated with fracture risk, older people may not eat enough dairy produce or may not be exposed to enough sunlight which affects absorption of vitamin D
- immune system; immune system reduces with age and is exacerbated by poor nutritional status in protein, zinc and vitamin levels, which could be attributed to low intake of fruit and vegetables due to being housebound or cost issues; this can lead to more serious problems such as wound infections and slow healing
- impaired cognitive function; antioxidant nutrients beta carotene, C, E and selenium are correlated with memory and integrity of blood vessels in brain, therefore low intakes of these nutrients may be linked to reduced cognitive function and stroke. Older people may not eat oily fish due to cost, or availability
- being underweight; poor appetite due to impaired sensory function, loneliness and isolation, or the effects of medication, can result in older people being deficient in certain nutrients, energy levels may be low
- obesity; a very common disorder in Western society due to a more sedentary lifestyle and an over-reliance on high fat, sugar and salt (HFSS) foods, this can be a risk factor for diabetes and hypertension
- anaemia; nutritional anaemia is usually caused by low dietary iron intake which could be attributed to perceived cost of red meat but medication and contributions from other complicating diseases may also increase risk of iron, folate and B₁₂ deficiencies

All other valid points will be given credit [15]

Section B

Total

25

25

70