



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2015**

Home Economics

Assessment Unit AS 1

assessing

Nutrition for Optimal Health

[AN111]

WEDNESDAY 20 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	Identify three food sources of complex carbohydrates. (AO1) <ul style="list-style-type: none">potatoesbreadrice All other valid points will be given credit	[3] 3
2	Explain the importance of an adequate intake of vitamin K for babies and outline how this is achieved. (AO1, AO2) <ul style="list-style-type: none">it is essential for normal clotting of bloodbabies and in particular premature babies and breastfed infants have low levels of this vitamin in their bloodthis can be achieved by giving <i>all</i> newborns a vitamin K supplement (via injection), which is administered in hospital immediately after birth All other valid points will be given credit	[4] 4
3	Compare haem and non-haem iron. State one food source for each type. (AO1, AO2) <ul style="list-style-type: none">the two types of iron are absorbed with different efficiency; haem iron is from animal food sources and is more easily absorbed, e.g red meat, as it is more solublenon-haem iron is present in plant sources and is not readily absorbed so it has to be converted to a more soluble form, e.g. green leafy vegetables All other valid points will be given credit	[4] 4
4	Why is fat important in the diet of an infant? (AO1, AO2) <ul style="list-style-type: none">fats are an important part of an infant's diet because of their energy density, that is they provide a lot of energy in a relatively small volumethe essential fatty acids found in milk, especially n-3 acids are important for development of the brain, vascular systems and retina in the early months of lifeprovides fat soluble vitamins A and D, required for growth All other valid points will be given credit	[5] 5
5	Outline the effects on health of a deficiency in vitamin A. (AO1, AO2) <ul style="list-style-type: none">reduces the rate of growth in childrenunable to synthesise rhodopsin resulting in night blindnessaffects health of the skin, e.g. roughened skinresistance to disease is lowered due to the poor condition of the mucous lining in respiratory tracttear glands become blocked and membranes at front of eye become dry and inflamed. All other valid points will be given credit	[5] 5

6 Describe the factors affecting the bioavailability of minerals in the body. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of bioavailability of minerals in the body
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to describe a range of factors affecting bioavailability and absorption of minerals 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 bioavailability of minerals 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 describe a range of factors affecting bioavailability and absorption of minerals 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 bioavailability of minerals 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 describe a range of factors affecting bioavailability and absorption of minerals in the body
- quality of written communication is very good to highly competent

Examples of suitable points to be described by the candidate:

- food sources; some foods are more bioavailable than others for example the lactose in milk enhances absorption and red meat is in the haem form and is more readily available in the body than their equivalent plant sources
- inhibiting factors; phytates and oxalates interfere with the absorption of iron and calcium due to binding with it and making it unavailable for absorption; other inhibitors are polyphenols (in tea, coffee and nuts) and phosphates (in egg yolks) which interfere with absorption of iron
- competition for absorption; there is competition between minerals, namely, iron, calcium and zinc
- promoting factors; absorption of certain nutrients can be facilitated by other substances, e.g. vitamin C can dramatically improve non-haem iron absorption and vitamin D causes the synthesis of a calcium binding protein in the cells that transports calcium into plasma
- physiological circumstances; mechanisms exist in the body that regulate uptake in response to physiological needs, e.g. iron and calcium are better absorbed during pregnancy/lactation

All other valid points will be given credit

[8]

8

- 7 Discuss the role of non-starch polysaccharides (NSP) in protecting against the occurrence of cardiovascular disease and bowel disorders. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of the role of NSP in protecting against the occurrence of cardiovascular disease and bowel disorders
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss the role of NSP in protecting against the occurrence of cardiovascular disease and bowel disorders
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the role of NSP in protecting against the occurrence of cardiovascular disease and bowel disorders
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to discuss the role of NSP in protecting against the occurrence of cardiovascular disease and bowel disorders
- 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 role of NSP in protecting against the occurrence of cardiovascular disease and bowel disorders
- 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 role of NSP in protecting against the occurrence of cardiovascular disease and bowel disorders
- quality of written communication is very good to highly competent

Examples of suitable points to be discussed by the candidate:

CVD

- cholesterol; unabsorbed NSP has the ability to bind and trap substances including cholesterol from the diet; soluble NSP has a lowering effect on blood cholesterol (both total and LDL cholesterol) which in turn reduces the risk of heart disease
- weight management; NSP plays an important contribution to weight management due to its high satiety value, displacing other energy dense foods; on this basis there is a reduced risk of heart disease which is associated with obesity

Bowel disorders

- constipation, diverticular disease, appendicitis and possibly irritable bowel syndrome; bowel contents are increased in volume which triggers peristalsis resulting in a reduced transit time, less pressure to remove bowel contents, thus being a benefit in a number of conditions
- colon cancer; unabsorbed NSP has the ability to bind other substances. Consequently possible carcinogenic by-products from the diet can be

eliminated from the bowel with NSP residues; if NSP intake is low bowel contents move slowly and allow harmful residues to persist
All other valid points will be given credit [8]

8 Explain the functions of protein as a nutrient in the body. (AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of a range of functions of protein
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain the functions of protein 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 a range of functions of protein
- 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 protein 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 a range of functions of protein
- 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 protein in the body
- quality of written communication is very good to highly competent

Examples of suitable points to be explained by the candidate:

- structure; each cell contains protein as part of the cell membrane and within its cytoplasm, protein is synthesised during growth, repair, maintenance and replacement during life, proteins also form part of the structural framework of bones
- formation of enzymes; almost all enzymes are proteins and thus proteins are instrumental in facilitating most of the chemical reactions that occur in the body, including digestion of nutrients and regulation of energy production in cells
- transport; many substances attach themselves to protein to facilitate transport in the body, e.g. haemoglobin is a transporting protein, to carry oxygen, transport proteins also carry substances across cell membranes, e.g. during absorption in the digestive tract
- homeostasis; the physiological mechanisms of the body aim to maintain a constant internal environment. This is achieved in many ways such as hormones acting like messengers carried in the circulation and proteins acting as buffers in the circulation to maintain an acid-base balance in the blood and bodily fluid

All other valid points will be given credit [8]

Section A

AVAILABLE MARKS

8

8

45

Section B

AVAILABLE
MARKS

- 9 (a) Outline the risks to mother and baby of low and excessive weight gain during pregnancy. (AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of the risks to mother and baby of low and excessive weight gain during pregnancy
- demonstrates a limited ability to outline these risks
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the risks to mother and baby of low and excessive weight gain during pregnancy
- demonstrates a reasonable to good ability to outline these risks
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- 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 risks to mother and baby of low and excessive weight gain during pregnancy
- demonstrates a very good to highly competent ability to outline these risks
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- quality of written communication is very good to highly competent

Examples of suitable points to be outlined by the candidate:

Risks to mother – excessive weight gain

- increased risk of prolonged labour resulting in birth injury
- gestational diabetes may occur during pregnancy, post partum pregnancy induced hypertension and pre-eclampsia which is a serious risk to mother
- increased risk of post partum problems for the mother such as overweight or obesity, type 2 diabetes, prolonged backache, varicose veins

Risks to mother – low weight gain

- pregnant women who receive inadequate nutrition experience greater maternal morbidity
- a higher risk of poor pregnancy outcomes, e.g. premature birth, miscarriage.
- increased risk of developing anaemia, lethargy and fatigue, more prone to infection and risk to bone and dental health

Risks to baby – low weight gain

- increased risk of low birth weight due to intrauterine growth retardation which could predispose child to greater chance of mortality or more

- susceptible to disease in later life
- increased risk of premature delivery which can result in the baby having an underdeveloped respiratory system
- other micronutrient deficiencies include cretinism (lack of iodine) and growth retardation from lack of zinc

Risks to baby – excessive weight gain

- macrosomia can increase risk of birth injury for baby
- increased risk of obesity post partum for baby

All other valid points will be given credit

[10]

AVAILABLE
MARKS

10

- (b) Discuss the current advice regarding foods that should be restricted or avoided during pregnancy. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of foods that should be restricted or avoided during pregnancy
- demonstrates a limited ability to discuss the current advice regarding these foods
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of foods that should be restricted or avoided during pregnancy
- demonstrates a reasonable to good ability to discuss the current advice regarding these foods
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- quality of written communication is reasonable to good

Mark Band ([11]–[15])

Overall impression: very good to highly competent

- clear knowledge and understanding of foods that should be restricted or avoided during pregnancy
- demonstrates a very good to highly competent ability to discuss these foods
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- quality of written communication is very good to highly competent

Examples of suitable points to be discussed by the candidate:

Foods to be restricted

- caffeine; high levels of caffeine can result in babies having a low birth weight, which can increase the risk of health problems in later life. Too much caffeine can also cause miscarriage
- oily fish; consumption should be restricted because oily fish contain dioxins and PCBs which are pollutants found in fish that can, over a long period of time, pose a risk to health

Foods to be avoided

- raw or undercooked eggs; increases the risk of salmonella food poisoning which is unlikely to harm the baby, but it can give the mother a severe bout of diarrhoea and vomiting
- raw meat; toxoplasmosis is an infection caused by a parasite that can be found in raw meat and unwashed fruit and vegetables, this infection can damage the baby
- certain cheeses; mould-ripened soft cheese, such as brie and camembert made with cows' or goats' milk and soft blue-veined cheeses should be avoided because soft cheeses are less acidic than hard cheeses and they contain more moisture, which means they can be an ideal environment for harmful bacteria, such as listeria, to grow in. Even a mild form of the illness in a pregnant woman can lead to miscarriage, stillbirth or severe illness in a newborn baby
- pâté; avoid all types of pâté, including vegetable pâtés, as they can contain listeria
- liver and liver products; don't eat liver or liver products such as liver pâté or liver sausage, as they may contain a lot of vitamin A and excess vitamin A can harm the baby
- certain varieties of fish; don't eat shark, marlin and swordfish as these types of fish contain high levels of mercury that can damage the baby's developing nervous system

All other valid points will be given credit

[15]

25

- 10 (a)** Explain the importance of including an adequate intake of the following in the diet of older people (65+):

- antioxidants; and
- fluids.

(AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of antioxidants and fluids in the diet of older people
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain the importance of antioxidants and fluids 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 antioxidants and fluids in the diet of older people
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to explain the importance of antioxidants and fluids 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 antioxidants and fluids in the diet

- of 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 explain the importance of including an adequate intake of antioxidants and fluids in the diet of older people
- quality of written communication is very good to highly competent

Examples of suitable points to be explained by the candidate:

Antioxidants

- selenium and vitamin A; may help prevent certain cancers. Research shows a link between good selenium status and reduced risk of cancer mortality, especially prostate, colon and rectal cancers which are common in older adults
- blood vessels in the brain; it is thought that an adequate intake may protect against degenerative changes in brain in later life
- vitamins A, C and E; may provide protection against heart disease as it prevents against the build up of fibrous plaques, relevant for this age group as the risk of CVD increases with age

Fluids

- thirst mechanism; older adults are less sensitive to thirst mechanisms so they may be at increased risk of dehydration
- excretion; since the water content of the body is reduced and possibly the ability of the kidney to concentrate urine decreases with age, an increased water intake is recommended to excrete the waste products from the body
- additional requirements; more fluid becomes even more important if the elderly are on medication or have impaired renal function
- alcohol; lower levels of body water tend to raise blood alcohol levels more readily in older people which can be problematic if taking medication and combining alcohol with inadequate fluid intake

All other valid points will be given credit

[10]

- (b)** Evaluate the role of supplementation in older people (65+). (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the role of supplementation in older people
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to evaluate the role of supplementation for this age group
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the role of supplementation in older people
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to evaluate the role of supplementation for this age group
- 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 role of supplementation in 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 evaluate the role of supplementation for this age group
- quality of written communication is very good to highly competent

Examples of suitable points to be evaluated by the candidate:

Arguments for

- vitamin D; due to being housebound and not getting enough natural sunlight, a supplement could be advised
- B vitamins; vitamins B₆, B₁₂ and folate can help reduce the levels of homocysteine in the blood, which is linked with heart disease, alzheimer’s disease and memory loss, supplements may help reduce the risk of heart problems or dementia
- drug interactions; the presence of disease and its treatment by drugs may affect nutritional needs, e.g. aspirin interferes with the absorption of vitamin C, thus resulting in a deficiency of this vitamin
- poor dentition; if intakes of red meat are low due to poor dentition and perhaps low income, iron supplements may be recommended
- bone density and ageing; there is accelerated bone loss, particularly in post menopausal women, which may lead to a significant decline in bone mass, increasing the risk of osteoporosis, supplementation of calcium and vitamin D after the menopause has been shown to delay bone loss and reduce risk of fractures
- antioxidants; supplementation with several antioxidants, most notably vitamin E and C has been associated with a reduced risk of age associated chronic diseases and maintenance of cognitive function
- vulnerable group; many issues such as poor appetite, reduced income, illness or mobility issues make it difficult for some older people to achieve a healthy balanced diet

Arguments against

- cost; supplements can be expensive for those on a low income
- absorption; certain minerals can compete for absorption, e.g. calcium and iron
- poor dietary habits; only single nutrient being provided
- self prescription and administration, this is not advised and may be risky

All other valid points will be given credit

[15]

AVAILABLE MARKS	
	25
Section B	25
Total	70

