

New
Specification



Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
January 2011

Home Economics

Assessment Unit AS 1

assessing

Nutrition for Optimal Health

[AN111]

MONDAY 10 JANUARY, AFTERNOON

MARK SCHEME

Section A

AVAILABLE MARKS

- 1** Identify **three** significant sources of protein for a vegan. (AO1)
- nuts
 - pulses
 - soya beans products
- All other valid points will be given credit. [3] 3
- 2** Explain **two** functions of potassium. (AO1, AO2)
- normal functioning of muscles and nerves
 - maintenance of fluid and electrolyte balance
- All other valid points will be given credit. [4] 4
- 3** Discuss the effects of vitamin A deficiency. (AO1, AO2)
- blindness in the long term, beginning with night blindness, xerophthalmia may also occur in long term, where dead cells accumulate on surface of eye, causing them to become dry and opaque
 - affects the health of the skin
 - increased risk of infections due to the poor condition of the respiratory tract
 - reduces growth in children
- All other valid points will be given credit. [4] 4
- 4** Describe in detail the role of selenium in the diets of adults. (AO1, AO2)
- immune system; acts as an antioxidant protecting cells of the immune system in the lymph nodes, spleen and liver from damage
 - fertility; recent research has indicated improvements in sperm motility, after selenium supplementation, in men
 - cancer; current research has suggested an inverse relationship between selenium status and cancer mortality – especially prostate, colon and rectal cancers
 - cardiovascular disease (CVD); selenium as an antioxidant, may help prevent CVD
- All other valid points will be given credit. [5] 5
- 5** Why is fat important in the diet of an infant (0-12 months)? (AO1, AO2)
- 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 volume
 - the essential fatty acids found in milk, in particular n-3 acids, are important for development of the brain, vascular systems and retina in early months of life
 - provides fat soluble vitamins A and D important for normal growth
- All other valid points will be given credit. [5] 5

6 Explain the functions of soluble and insoluble NSP in the diet. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of NSP in the diet
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain the functions of soluble and insoluble NSP in the diet
- demonstrates a limited ability to select appropriate functions for both soluble and insoluble NSP in the diet
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of NSP in the diet
- 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 soluble and insoluble NSP in the diet
- demonstrates a reasonable to good ability to select appropriate functions for both soluble and insoluble NSP in the diet
- quality of written communication is reasonable to good

Mark Band ([6]–[8])

Overall impression: very good to highly competent

- clear knowledge and understanding of NSP in the diet
- 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 soluble and insoluble NSP in the diet
- demonstrates a very good to highly competent ability to select appropriate functions for both soluble and insoluble NSP in the diet
- quality of written communication is very good to highly competent

Some examples of suitable points to be explained by the candidate:

Soluble NSP

- lowers blood cholesterol levels total and LDL; thus lowering the incidence of cardiovascular disease (CVD)
- slows down the release of glucose into the bloodstream; can be useful in the management of diabetes
- slows digestion; slows the emptying of the stomach, also increases satiety, controlling appetite

Insoluble NSP

- increases bulk; binds with water in the intestine increasing the bulk of the material passing through the large intestine, stimulating peristalsis aiding the voiding of faeces
- reduces the concentration of bowel contents, thus helping to prevent gallstones, cancers and diverticular disease

All other valid points will be given credit.

[8]

8

7 Discuss a range of factors which could affect vitamin C status in the body.
(AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of vitamin C status in the body
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss a range of factors which could affect vitamin C status in the body
- demonstrates a limited ability to select an appropriate range of factors
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of vitamin C status 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 discuss a range of factors which could affect vitamin C status in the body
- demonstrates a reasonable to good ability to select an appropriate range of factors
- 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 C status 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 discuss a range of factors which could affect vitamin C status in the body
- demonstrates a very good to highly competent ability to select an appropriate range of factors
- quality of written communication is very good to highly competent

Some examples of suitable points to be discussed by the candidate:

- intake; the amount of vitamin C in fruit and vegetables is very variable;
- losses during processing, preparation and storage; vitamin C is susceptible to damage by heat, light, oxygen, enzymes and minerals
- metabolism; this will vary with the metabolic demands of the individual e.g. smokers, pregnancy, exercise, diabetes and polluted environment will increase the demand for vitamin C; levels of vitamin C also become depleted with age
- absorption; this is affected by the amount of vitamin ingested (the more consumed, the less absorbed)

All other valid points will be given credit.

[8]

8

- 8 Explain why certain foods should be restricted or avoided during pregnancy.
(AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of the dietary recommendations in relation to foods which should be restricted or avoided during pregnancy
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to consider the dietary recommendations in relation to foods which should be restricted or avoided during pregnancy
- demonstrates a limited ability to select appropriate foods in relation to pregnancy
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the dietary recommendations in relation to foods which should be restricted or avoided during pregnancy
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to consider the dietary recommendations in relation to foods which should be restricted or avoided during pregnancy
- demonstrates a reasonable to good ability to select appropriate foods in relation to pregnancy
- 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 dietary recommendations in relation to foods which should be restricted or avoided during pregnancy
- 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 dietary recommendations in relation to foods which should be restricted or avoided during pregnancy
- demonstrates a very good to highly competent ability to select appropriate foods in relation to pregnancy
- quality of written communication is very good to highly competent.

Some examples of suitable points to be considered by the candidate:

- soft cheeses; avoid Camembert, Brie or Chevre or others with similar rind; these are made with mould and they can contain *Monocytogenes Listeria*, a harmful bacteria which could harm the baby
- raw or partially cooked eggs; avoid eating products such as mousses in order to avoid the risk of *Salmonella*, which causes food poisoning

- liver and products containing vitamin A; foods containing high levels of vitamin A, including liver and liver products such as pate and avoid taking supplements or fish liver oils, high levels could reach toxic levels, harming the unborn baby
- some types of fish; avoid shark, swordfish and marlin and restrict intake of tuna, to two tuna steaks per week, as these fish may contain high levels of mercury which can harm a baby's developing nervous system
- raw shellfish; can contain harmful bacteria and viruses that could cause food poisoning, which is particularly unpleasant during pregnancy
- alcohol, restrict intake to no more than 1-2 units of alcohol, once or twice a week and never drink in excess
- caffeine; occurs naturally in a range of foods, such as coffee, tea and chocolate and it is also added to some soft drinks and 'energy' drinks, limit this to no more than 200mg a day as high levels of caffeine can result in babies having a low birth weight, or even result in miscarriage

All other valid points will be given credit.

[8]

Section A

**AVAILABLE
MARKS**

8

45

Section B

AVAILABLE
MARKS

- 9 (a) Outline a range of issues which could result in poor energy balance for adolescents. (AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of energy balance during adolescence
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to consider a range of issues which could result in poor energy balance for adolescents
- demonstrates a limited ability to select an appropriate range of issues
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of energy balance during adolescence
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to consider a range of issues which could result in poor energy balance for adolescents
- demonstrates a reasonable to good ability to select an appropriate range of issues
- quality of written communication is reasonable to good

Mark Band ([8]–[10])

Overall impression: very good to highly competent

- clear knowledge and understanding of energy balance during adolescence
- 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 a range of issues which could result in poor energy balance for adolescents
- demonstrates a very good to highly competent ability to select an appropriate range of issues
- quality of written communication is very good to highly competent

Some examples of suitable points to be outlined by the candidate:

- lack of physical activity; many young people are largely sedentary as judged by the time spent doing moderate or vigorous activity, this has a significant effect on energy balance and has long term implications for the health of teenagers
- poor food choices; over reliance on fast foods and snacks which tend to be high in fat and sugar leading to positive energy balance
- teenage athletes; these may be particularly vulnerable if they spend a lot of time training and participating in their chosen sport; energy needs must be met in addition to their needs for growth, energy needs could be 50% greater than those of an average teenager, meeting these needs can involve eating huge amounts of food which may be daunting for some teenagers

- more disposable income; young people have greater freedom in food selection, this, together with increased independence can lead to rebelliousness over what is eaten and the rejection of foods considered to be 'healthy'; this can lead to an increased consumption of more energy dense snacks and fast food options
- using food emotionally; concerns about relationships, school etc can lead to over or under-eating, if young people have low self esteem and have serious concerns about their body image, they could develop extreme dieting or eating disorders

All other valid points will be given credit.

[10]

- (b) Discuss the specific nutritional requirements of an adolescent.
(AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of specific nutritional requirements during adolescence
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss the specific nutritional requirements during adolescence
- demonstrates a limited ability to select specific nutritional requirements 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 specific nutritional requirements during adolescence
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to discuss the specific nutritional requirements during adolescence
- demonstrates a reasonable to good ability to select specific nutritional requirements 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 specific nutritional requirements during adolescence
- 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 specific nutritional requirements during adolescence
- demonstrates a very good to highly competent ability to select specific nutritional requirements for this age group
- quality of written communication is very good to highly competent

Some examples of suitable points to be discussed by the candidate:

- energy; adequate energy is important as low energy density could limit growth during adolescence, energy is important for the rapid growth spurt and synthesis of new tissue
- protein; is necessary for muscle development and growth spurt
- calcium; is needed for skeletal growth, bone assimilates most of its minerals at this stage and achieves most of its final mass, a poor bone mass and failure to consume adequate calcium could lead to PBM not being achieved and subsequently greater risk of osteoporosis later in life
- iron; both boys and girls have an increased requirement for iron due to the relatively large blood volume during periods of rapid growth, the onset of menstruation represents a further stress in the iron status of adolescent girls; there is also evidence to suggest that borderline iron levels can have adverse effects on cognitive function, this could have implications in terms of learning ability and academic performance
- vitamin D; is required for the efficient absorption of calcium, which in turn is required for bone development; there is some concern that some teenagers are not getting enough exposure to sunlight to achieve adequate vitamin D
- folate; needed for the release of energy from food, it is also needed for the involvement in DNA and RNA synthesis in cell growth and cell division
- zinc; is needed for normal growth and sexual development, this mineral is also associated with boosting the immune system
- vitamin C; is needed to assist the absorption of iron, particularly non-haem iron, it also boosts the immune system

[15]

25

AVAILABLE
MARKS

- 10 (a) Discuss the energy and micro-nutrient requirements of older people.
(AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of energy and micro-nutrient requirements of older people
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss the energy and micro-nutrient requirements of older people
- demonstrates a limited ability to select specific micro-nutrient requirements for this age group
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of energy and micro-nutrient requirements 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 discuss the energy and micro-nutrient requirements of older people
- demonstrates a reasonable to good ability to select specific micro-nutrient requirements for this age group
- quality of written communication is reasonable to good

Mark Band ([8]–[10])

Overall impression: very good to highly competent

- clear knowledge and understanding of energy and micro-nutrient requirements 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 discuss the energy and micro-nutrient requirements of older people
- demonstrates a very good to highly competent ability to select specific micro-nutrient requirements for this age group
- quality of written communication is very good to highly competent

Some examples of suitable points to be discussed by the candidate:

- energy; needs decrease with age due to reduction in physical activity levels (accounting for two thirds of the reduction) this can be accelerated by retirement and is inevitable in those who are housebound or bedridden; the second factor is due to a decrease in basal metabolism, due to a decline in lean body mass
- vitamin C; needed for maintenance of healthy connective tissue and deficiency can result in poor wound healing and weakened immune system, also vitamin C has antioxidant properties which play a role in preventing degenerative diseases, the absorption of this vitamin may also be affected by medication e.g aspirin
- vitamin D; may be deficient due to lack of exposure to sunlight, reduced vitamin D synthesis in ageing skin, and impaired renal conversion
- B vitamins; folate, B12 and others are important to prevent anaemia, low folate status is quite common and may be due to poor dietary intake, or

malabsorption as a result of digestive diseases or drug/nutrient interactions of certain medications, folate and B6 may also help to lower homocysteine levels, thus reducing risk of cardiovascular disease; elevated levels of homocysteine have also been implicated in the development of cognitive impairment at this lifestage

- iron; the need for this is reduced due to the cessation of menstruation, however due to malabsorption of nutrients at this lifestage, iron is still important to prevent iron deficiency anaemia and associated problems
- calcium, adequate intakes can help to slow age-related bone loss, which can result in osteoporosis and fractures

All other valid points will be given credit.

[10]

(b) Justify the advice you would give to older people to minimise the risk of the following dietary related disorders:

- constipation;
- anaemia and
- osteoporosis.

(AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of constipation, anaemia and osteoporosis
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to justify the advice you would give to older people to minimise the risk of these dietary related disorders
- demonstrates a limited ability to select specific advice to reduce the risk of these dietary related disorders in older people
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of constipation, anaemia and osteoporosis
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to justify the advice you would give to older people to minimise the risk of these dietary related disorders
- demonstrates a reasonable to good ability to select specific advice to reduce the risk of these dietary related disorders in older people
- quality of written communication is reasonable to good

Mark Band ([11]–[15])

Overall impression: very good to highly competent

- clear knowledge and understanding of constipation, anaemia and osteoporosis
- 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 justify the advice you would give to older people to minimise the risk of these dietary related disorders

- demonstrates a very good to highly competent ability to select specific advice to reduce the risk of these dietary related disorders in older people
- quality of written communication is very good to highly competent

Some examples of suitable points to be justified by the candidate:

Constipation

- eat more fruit and vegetables and wholegrain foods; diet and dietary habits can play a role in developing constipation; lack of interest in eating may lead to heavy use of convenience foods, which tend to be low in NSP, in addition, loss of teeth may force older people to choose soft, processed foods, also low in NSP
- drink plenty of fluids; water and other fluids add bulk to stools, making bowel movements softer and easier to pass
- get regular exercise; prolonged bedrest, for example, after an accident or during an illness, and lack of exercise may contribute to constipation

Anaemia

- eat plenty of lean red meat; this will ensure an adequate intake of haem iron
- increase consumption of fruit and vegetables; this will boost vitamin C intake which also assists the absorption of non-haem iron
- food interactions; become informed about various food combinations which could inhibit the absorption of iron in the body e.g avoid eating whole grain cereals, tea, chocolate, eggs etc as they contain various inhibiting factors
- ensure an adequate intake of vitamin B₁₂; levels may be low due to decreased absorption and may lead to pernicious anaemia

Osteoporosis

- increase participation in weight bearing activity; extreme inactivity in older adults have all been associated with loss of bone mass
- maintain a healthy body weight; being underweight is associated with a higher risk of osteoporotic fracture this is often as a result of low lean body mass caused by inactivity
- ensure adequate intake of calcium and vitamin D; studies have shown that supplementation may prevent or slow down the age related loss of bone
- inhibiting factors; monitor the intake of phytates, high protein or sodium rich foods as these may hinder calcium absorption or promote increased urinary excretion

All other valid points will be given credit.

[15]

25

Section B

25

Total

70

AVAILABLE MARKS