Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
January 2013

Home Economics

Assessment Unit AS 1

assessing

Nutrition for Optimal Health

[AN111]

MONDAY 14 JANUARY, AFTERNOON

MARK SCHEME

Section A

AVAILABLE MARKS

1 State **three** rich food sources of vitamin E. (AO1)

- vegetable oils
- nuts
- seeds

All other valid points will be given credit [3] 3

2 Explain **two** functions of the mineral phosphorus. (AO1, AO2)

- bone and tooth structure; phosphorus along with calcium, is an essential constituent of bones and teeth, 80% of the phosphorous in the body is present as calcium salts in the skeleton
- energy metabolism; the rest of the body's phosphorus is distributed in all cells and contributes to a number of processes associated with energy metabolism

All other valid points will be given credit [4] 4

3 What is meant by the term nitrogen balance in relation to protein requirements? (AO1, AO2)

- indicator of protein metabolism; it is the overall indicator of protein metabolism in the body, which is the difference between intake and losses of nitrogen
- positive nitrogen balance; this indicates protein is being retained in the body, indicating protein synthesis, that is, growth or major tissue repair
- negative nitrogen balance occurs when losses exceed intake indicative of protein being depleted which could be caused by starvation, injury or illness

All other valid points will be given credit [4] 4

4 Examine the nutritional benefits of breast milk for an infant. (AO1, AO2)

- correct nutritional proportions; breastfeeding provides nutrients in the correct proportion for the baby, however this is dependent on the mother's diet
- boosts immunity; breast milk also contains anti-bacterial and anti-infection agents, which have an important role to play in boosting immune function
- more efficient digestion and absorption; e.g. of iron, fat, zinc, folate, B_{12}, trace elements

All other valid points will be given credit [5] 5

		AVAILABLE MARKS
5	Discuss the role of essential fatty acids in the diet. (AO1, AO2) • essential for the maintenance of cell membranes • they make hormone-like substances such as prostaglandins and other eicosanoids which are involved in a number of functions in the body such as the clotting of the blood and regulation of cholesterol • they are needed for metabolism, stimulation of smooth muscle contraction, effects on the immune system and the nervous system • there is evidence that eating EFA reduces the risk of death from heart attacks by decreasing the tendency of the blood to clot All other valid points will be given credit [5]	5

AVAILABLE MARKS

6 Consider the role of non-starch polysaccharide (NSP) in protecting against the occurrence of disease. (AO1, AO2, AO3)

Mark Band ([0]–[2])
Overall impression: basic
- inadequate knowledge and understanding of the role of NSP
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to consider the role of NSP in protecting against the occurrence of disease
- 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
- 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 NSP in protecting against the occurrence of disease
- 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
- 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 NSP in protecting against the occurrence of disease
- quality of written communication is very good to highly competent

Examples of suitable points to be considered by the candidate:

- heart disease; unabsorbed NSP has the ability to bind and trap other substances including cholesterol from the diet; soluble NSP has a lowering effect on plasma cholesterol which in turn reduces the risk of heart disease
- bowel disorders; bowel contents increase in volume which facilitates contractions of the large intestine resulting in a reduced transit time, less pressure to remove bowel contents, thus being a benefit to a number of conditions, namely constipation, diverticular disease, appendicitis, possibly irritable bowel syndrome, bowel cancer
- overweight and obesity; high fibre diets tend to be high in starch and low in fat and thus the energy density of such diets tends to be low. NSP also has a satiating effect and thus is useful in regulating energy balance in those prone to overweight and obesity; soluble NSP slows gastric emptying and may contribute to feelings of fullness
- diabetes; increased intake of NSP has been shown to improve glucose intolerance; increased NSP content of food slows down the rate of glucose absorption from the gut and thus reduces subsequent peak concentrations of glucose and insulin in the blood, benefiting those with diabetes

All other valid points will be given credit [8]

8

AVAILABLE MARKS

7 Discuss the dietary advice which could be given to older people (65+) in order to maximise their iron intake and reduce their risk of developing iron deficiency anaemia. (AO1, AO2, AO3)

Mark Band ([0]–[2])
Overall impression: basic
- inadequate knowledge and understanding of appropriate dietary advice to give to older people in order to maximise their iron intake and reduce their risk of developing iron deficiency anaemia
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss advice in the context of older people
- quality of written communication is basic

Mark Band ([3]–[5])
Overall impression: reasonable to good
- reasonable to good knowledge and understanding of appropriate dietary advice to give to older people in order to maximise their iron intake and reduce their risk of developing iron deficiency anaemia
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to discuss advice in the context of older people
- quality of written communication is reasonable to good

Mark Band ([6]–[8])
Overall impression: very good to highly competent
- clear knowledge and understanding of appropriate dietary advice to give to older people in order to maximise their iron intake and reduce their risk of developing iron deficiency anaemia
- 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 advice in the context of older people
- quality of written communication is very good to highly competent

Examples of suitable points to be discussed by the candidate:

- include plenty of meat in the diet; red meat contains haem iron more readily absorbed by the body, this can still be obtained from cheaper cuts of meat such as liver, stewing steak which may be more affordable for older people on a low income
- be aware of inhibiting factors; absorption may be compromised by phytates in whole grain cereals, polyphenols in tea and coffee, oxalic acid in spinach and chocolate and phosphates in egg can all bind with iron and make it unavailable for absorption, do not eat these foods along with iron rich foods
  be aware of drug interactions; some commonly prescribed drugs for older people can interfere with vitamin C absorption and thus affect the bioavailability of iron

	AVAILABLE MARKS
• include vitamin C rich foods in the diet; these assist iron absorption, e.g. fruit and vegetables, fresh or frozen, depending on the cost, access to shops and general availability for the older person All other valid points will be given credit [8]	8

		AVAILABLE MARKS
8	Water is essential for our bodies to work properly. Explain the functions of water in the body. (AO1, AO2, AO3) **Mark Band ([0]–[2])** Overall impression: basic • inadequate knowledge and understanding of the functions of water • demonstrates a limited ability to apply appropriate knowledge and understanding to the question • demonstrates a limited ability to explain the functions of water 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 water • 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 water 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 water • 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 water in the body • quality of written communication is very good to highly competent **Examples of suitable points to be explained by the candidate:** • medium; nutrients, enzymes and other chemical substances can be dispersed in water and chemical reactions necessary for maintaining life can also take place in water • transport; nutrients are carried to cells and waste products are transported from cells by blood plasma which is 90% water • excretion; waste products are removed from the blood by the kidneys and excreted in the urine • temperature; water helps to regulate body temperature All other valid points will be given credit [8]	8
	Section A	**45**

Section B

AVAILABLE MARKS

9 (a) Explain the advice parents should follow to prevent obesity in their children. (AO1, AO2, AO3)

Mark Band ([0]–[3])
Overall impression: basic
- inadequate knowledge and understanding of obesity in children
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to present appropriate advice for parents to help prevent obesity in children
- demonstrates a limited ability to explain this advice
- quality of written communication is basic

Mark Band ([4]–[7])
Overall impression: reasonable to good
- reasonable to good knowledge and understanding of obesity in children
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to present appropriate advice for parents to help prevent obesity in children
- demonstrates a reasonable to good ability to explain this advice
- quality of written communication is reasonable to good

Mark Band ([8]–[10])
Overall impression: very good to highly competent
- clear knowledge and understanding of obesity in children
- 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 present appropriate advice for parents to help prevent obesity in children
- demonstrates a very good to highly competent ability to explain this advice
- quality of written communication is very good to highly competent

Examples of suitable points to be explained by the candidate:

- restrict dietary energy from fat; the amount of energy derived from fat should be reduced to 35% to reduce the energy density of the diet; this could be achieved by reducing consumption of processed foods, and changing cooking methods, e.g. from frying to grilling
- restrict dietary energy from sugar; the amount of energy derived from sugar should be restricted to 11% to reduce calorie intake; this could be achieved by reducing the consumption of ready-made desserts, cakes and biscuits, not rewarding children with sweet treats, reducing intakes of sugar-coated breakfast cereals and monitoring intakes of confectionery and fizzy drinks

- increase intake of fruit and vegetables; parents need to ensure an intake of five portions of fruit and vegetables as these are naturally low in fat, vegetables could be incorporated into soups and other meals
- increase intake of starchy foods; parents could ensure meals are based on starchy foods, e.g. pasta, bread, rice and potatoes and to consume wholegrain whenever possible as these are less energy dense compared to fat and have a satiating effect
- increase physical activity; ensure children do not engage in a sedentary lifestyle, restrict use of computer games and television viewing and encourage physical activities as a whole family to make it more enjoyable

All other valid points will be given credit [10]

(b) Evaluate the role of supplementation in childhood and adolescence. (AO1, AO2, AO3)

Mark Band ([0]–[5])
Overall impression: basic

- inadequate knowledge and understanding of supplementation in childhood and adolescence
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to evaluate the role of supplementation in childhood and adolescence
- quality of written communication is basic

Mark Band ([6]–[10])
Overall impression: reasonable to good

- reasonable to good knowledge and understanding of supplementation in childhood and adolescence
- 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 in childhood and adolescence
- quality of written communication is reasonable to good

Mark Band ([11]–[15])
Overall impression: very good to highly competent

- clear knowledge and understanding of supplementation in childhood and 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 evaluate the role of supplementation in childhood and adolescence
- quality of written communication is very good to highly competent

	AVAILABLE MARKS
Examples of suitable points to be evaluated by the candidate:	
Advantages • certain teenage groups; folic acid may be beneficial during teenage pregnancy; vegan teenagers may benefit from vitamin B_{12}; faddy eaters may benefit from a multi supplement in the short term • growth and development; iron supplements may be beneficial for girls who have heavy periods or where the diet is poor and anaemia has been diagnosed • cognitive function; Omega 3 for possible brain development, improved concentration and behaviour • bone health; calcium for bone development if diet is limited or there is a history of osteoporosis in the family Disadvantages • excess; too much of certain vitamins, e.g. vitamin A can cause liver and bone damage, hair loss, double vision, vomiting, headaches, excess vitamin B_6 can cause neurological problems, excess folic acid can mask a vitamin B_{12} deficiency • eating habits; could encourage poor eating habits for the future, they are not a substitute for a healthy diet • cost; expensive if given regularly All other valid points will be given credit [15]	25

AVAILABLE MARKS

10 (a) Outline the health risks for a pregnant mother associated with both low and excessive weight gain in pregnancy. (AO1, AO2, AO3)

Mark Band ([0]–[3])
Overall impression: basic
- inadequate knowledge and understanding of the health risks associated with low and excessive weight gain during pregnancy
- 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 associated with low and excessive weight gain during pregnancy
- 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 associated with low and excessive weight gain 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 outline these health risks
- quality of written communication is very good to highly competent

Examples of suitable points to be outlined by the candidate:

Low weight gain
- possible indication of nutritional vulnerability; low calcium intake during pregnancy may increase risk of osteoporosis in later life; low iron intake increase the risk of anaemia
- low energy stores; reduced ability to cope with the increased demands of pregnancy

Excessive weight gain
- complications in labour; increased risk of prolonged labour resulting in birth injury
- increased risk of health issues for the mother; gestational diabetes may occur during pregnancy and risk of continuing post partum pregnancy induced hypertension and pre-eclampsia which is a serious risk to mother
- increased risk of post partum diseases for the mother; overweight or obesity, Type 2 diabetes

All other valid points will be given credit [10]

(b) Discuss the need for calcium, folate and protein during pregnancy and suggest how these nutrients could be included in the diet.
(AO1, AO2, AO3)

Mark Band ([0]–[5])
Overall impression: basic
- inadequate knowledge and understanding of the need for calcium, folate and protein during pregnancy
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss these needs
- demonstrates a limited ability to suggest how these nutrients could be included in the diet
- quality of written communication is basic

Mark Band ([6]–[10])
Overall impression: reasonable to good
- reasonable to good knowledge and understanding of the need for calcium, folate and protein during pregnancy
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to discuss these needs
- demonstrates a reasonable to good ability to suggest how these nutrients could be included in the diet
- 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 need for calcium, folate and protein 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 discuss these needs
- demonstrates a very good to highly competent ability to suggest how these nutrients could be included in the diet
- quality of written communication is very good to highly competent

	AVAILABLE MARKS
Examples of suitable points to be discussed by the candidate:	
Calcium • increased requirements in last trimester; the requirements are increased in the third trimester of pregnancy • gastrointestinal changes; the mother's body adapts to increase levels of active vitamin D which increases absorption of calcium and facilitates foetal accumulation and development • maintaining mother's supply; adequate calcium is needed to maintain the mother's skeleton • blood pressure; calcium is also important for the maintenance of normal blood pressure in pregnancy • sources; milk, dairy produce, nuts, pulses, bread and tinned fish	
Folate • bioavailabilty of folate; natural folates are less bioavailable than the synthetic form (folic acid) so a supplement is advised • current recommendations; the requirement is to take 0.4mg folic acid up to the first 12 weeks. For women who had previous neural tube defects (NTD) the advice is 5mg a day • requirements during pregnancy; folate is required to prevent NTD, e.g. spina bifida and may also prevent tiredness, premature birth, miscarriage and cleft lip • sources; green leafy vegetables, fortified cereals, bread, oranges and whole wheat, supplement diet with 0.4mg of folic acid	
Protein • metabolic adaptations; when the foetus enters a rapid growth phase, protein is made available from the mother's tissues, therefore it is not necessary to significantly increase intake • requirements during pregnancy; it is essentially needed for maternal tissue, development of foetus and milk production in the third trimester • sources; lean meat, fish, eggs, milk, cheese, soya based products	
All other valid points will be given credit [15]	25
Section B	**25**
Total	**70**