



Rewarding Learning

**ADVANCED
General Certificate of Education
2015**

Health and Social Care

Assessment Unit A2 15

assessing

Unit 15: Human Nutrition and Dietetics

[A6H71]

TUESDAY 9 JUNE, 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.

- 1 (a) Identify three risk factors from the scenario which may lead to Joan developing Type 2 diabetes. (AO1)

Answers may include any three of the following:

- age
- obesity/overweight
- impaired glucose tolerance when pregnant
- lack of physical exercise

(3 × [1])

[3]

- (b) List three symptoms of Type 2 diabetes. (AO1)

Answers may include any three of the following:

- increased thirst
- severe dehydration
- need to pass urine much more often
- high blood glucose concentration
- weight loss
- tiredness
- blurred vision
- itch in genital area

All other valid points will be given credit

(3 × [1])

[3]

- (c) Discuss three pieces of dietary advice which may be given by a specialist nurse on the management of diabetes. (AO1, AO2)

Answers may address three of the following:

- eat foods rich in soluble NSP, e.g. oats which help maintain blood sugar levels
- ensure a healthy, balanced diet is followed, eat regular meals/ eat at regular intervals
- check sugar content on labels/ avoid high sugar content foods
- follow a diet low in fat and unsaturated fat
- follow a diet high in fibre and complex carbohydrates
- eat more vegetables
- safe alcohol intake

All other valid points will be given credit

[1] for use of key phrase(s), [2] for adequate discussion, [3] for fuller discussion

(3 × [3])

[9]

- (d) Complete the table below to identify different examples of each type. Answers may address three of the following: (AO1)

Starches

Natural:

- potatoes
- rice
- root vegetables
- wholegrain cereals

Refined:

- biscuits, pastries and cakes
- pizzas
- breakfast cereals
- bread
- flour
- pasta
- rice

Answers may address three of the following:

Sugars

Natural:

- fruit
- milk
- honey
- vegetables
- brown and white sugar

Accept sucrose, maltose
and lactose

Refined:

- biscuits
- cakes/pastries
- chocolate
- jams
- jellies
- processed foods and sauces
- soft drinks
- sweets
- snack bars
- fruit juice

All other valid points will be given credit.

[(6) × [1]]

[6]

- (e) Analyse three risks to an individual of eating excess carbohydrates.
(AO1, AO2, AO3, AO4)

Answers may address any three of the following:

- excess carbohydrate is converted to fat and stored in the adipose tissue leading to weight gain
- dental caries: there is a close correlation between the rate of dental caries and sugar consumption. Studies in which PH has been measured following consumption of sugar-containing food and drinks show a rapid fall in PH which follows sugar intake. This results in dissolution of the tooth enamel. Research studies show that the most caries causing sugars are non-milk extrinsic sugars which are present on the tooth surface without cell walls. Also relevant are the concentration of the sugar, the period of contact and the frequency of consumption. This can result in poor oral health, affects ability to eat, confidence and self esteem
- Type 2 diabetes which develops more commonly in older people is linked with overweight and an excessive intake of any source of energy. This leads to health complications, e.g. poor eyesight, circulation problems and reduced life expectancy
- metabolic consequences increased fasting plasma triglycerides in men and post menopausal women. Decreased HDL cholesterol. Increased fasting insulin levels. Diseases that may be implicated include CHD, diabetes, gallstones, hypertension and kidney stones
- eating an excess of carbohydrate may result in children feeling “full” and therefore they may not consume enough essential nutrients
- excess consumption of NSP can result in poor absorption of essential vitamins and minerals
- Crohn’s disease
- hyperactivity

All other valid points will be given credit

[0] is awarded for a response not worthy of credit

Level 1 ([1]–[3])

Overall impression: basic

- displays limited knowledge of the risks of having excess carbohydrates in the diet
- may list risks or limited analysis
- answers which focus on only one risk cannot score beyond this level
- quality of written communication is basic. The candidate makes a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

Level 2 ([4]–[6])

Overall impression: adequate

- displays adequate knowledge of the risks of having excess carbohydrates in the diet
- at least two risks addressed to score at this level
- adequate analysis of three risks or quality of analysis may vary
- candidates who only address two risks cannot achieve beyond this level
- quality of written communication is good. The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

Level 3 ([7]–[9])

Overall impression: competent

- displays a good knowledge of the risks of having excess carbohydrates in the diet
- competent analysis of three risks
- there may be some variation in the level of analysis of the risk factors
- quality of written communication is competent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard to make meaning clear. [9]

30

- 2 (a) Explain the impact on Anne's health if her intake of the two nutrients remains at their current level. (AO1, AO2)

Answers may include:

- Calcium – Anne's calcium intake is below her recommended daily intake for calcium which could result in osteomalacia/osteoporosis which is the loss of bone mass and density with age resulting in fragile bones which are susceptible to fractures.
- Iron – Anne's iron intake is below her recommended daily intake for iron which could result in anaemia. When iron stores become depleted, the amount of ferritin in the blood will fall. When the number of red cells becomes so low that the oxygen-carrying capacity to the tissues is affected, therefore the individual will suffer the symptoms of anaemia including fatigue, apathy, loss of appetite and poor temperature regulation.

[1] for key phrase(s), [2] for explanation.

(2 × [2])

[4]

- (b) Name one other rich dietary source of calcium. (AO1)

Answers may include one of the following:

- fortified cereals and cereal products
- green leafy vegetables
- small fish such as sardines whose bones (when eaten) supply calcium
- eggs
- apricots
- dried figs
- nuts (almonds, Brazil nuts)
- soya beans
- fortified orange juice
- fortified soya milk

All other valid points will be given credit

(1 × [1])

[1]

- (c) Explain why Anne has been advised to combine Vitamin C with her intake of iron. (AO1, AO2)

Answers should address the following point:

- Vitamin C – intake important as it assists in the absorption of non-haem iron. It enhances iron absorption from food by reducing ferric iron to ferrous iron to facilitate absorption.

[1] for key phrase(s), [2] for explanation

(1 × [2])

[2]

- (d) Discuss how the following three factors affect John's Basal Metabolic Rate. (BMR) (AO1, AO2, AO3)

Age

- Basal metabolic rate declines with age – so John's BMR will decrease as he gets older

State of health

- John is recovering from surgery which can increase his BMR
- John may also be on treatment for an illness or as a result of his surgery which could affect his BMR

Gender

- As John is male, his BMR is higher than that of a woman because of differences in the proportions of body fat to lean. In men the proportion of body fat content, is on average, 10% lower than in women with a consequently higher lean mass and thus higher BMR

[1] for use of key phrase(s), [2] for adequate discussion,

[3] for fuller discussion.

(3 × [3])

[9]

- (e) Analyse the importance of fruit and vegetables in the diet of adults.
(AO1, AO2, AO3)

Answers may address the following points

Fruit and vegetables

- a major source of dietary fibre
- they are low in energy and so make the diet bulky which may help in weight control/feeling fuller for longer/avoid snacking on fatty/sugary foods
- they are a major source of potassium and high potassium intake may help in the prevention of high blood pressure
- riboflavin – needed for healthy skin. Helps release energy to cells in the body's use of carbohydrates
- niacin – assists in the nervous system and healthy skin. Involved in the energy producing reactions in the body cells
- vitamin A – good for night vision and healthy skin and tissue
- vitamin C – essential factor for the synthesis of collagen that forms part of the structural framework for bones, therefore maintaining the body's connective tissue. Important for wound healing. Helps iron absorption and has antioxidant properties, reducing the risk of CHD and cancer
- add water to the diet increasing hydration
- fruit and vegetables add interest, texture, variety and colour to the diet

All other valid points will be given credit

[0] is awarded for a response not worthy of credit

Level 1 ([1]–[2])

Overall impression: basic

- displays limited knowledge of the importance of fruit and vegetables in the diet of adults.
- limited analysis.

Level 2 ([3]–[4])

Overall impression: adequate

- displays adequate knowledge of the importance of fruit and vegetables in the diet of adults.
- adequate analysis.

Level 3 ([5]–[6])

Overall impression: competent

- displays a very good to excellent knowledge and understanding of the importance of fruit and vegetables in the diet of adults.
- competent analysis.

[6]

- (f) Analyse the nutritional needs of women in adolescence, adulthood and old age. (AO1, AO2, AO3, AO4)

Answers may address the following:

Adolescence

- energy needs of adolescents are influenced by activity level, basal metabolic rate, and increased requirements to support pubertal growth and development. Adolescents need additional energy for growth and activity. Adolescent girls need approximately 2,200 calories each day. This is a significant increase from childhood requirements. To meet these calorie needs, adolescents should choose a variety of healthy foods, such as lean protein sources, low-fat dairy products, whole grains, fruits, and vegetables.
- during adolescence dietary fat continues to play important roles as an energy source
- protein needs of adolescents are determined by the amount of protein required for maintenance of existing lean body mass and the development of additional lean body mass during the adolescent growth spurt. Adolescents need between 45 and 60 grams of protein each day.
- it is estimated 45% of peak bone mass is attained during adolescence and so adequate calcium intake is important for the development of dense bone mass and the reduction of the risk of fractures and osteoporosis in women in later life
- iron is vital for transporting oxygen in the bloodstream. A deficiency of iron causes anaemia. With the onset of adolescence, the need for iron increases as direct consequence of rapid growth and the expansion of blood volume and muscle mass. As adolescents gain muscle mass, more iron is needed to help their new muscle cells obtain oxygen for energy. The onset of menstruation imposes additional iron needs for girls. The Recommended Dietary Allowance (RDA) for iron is 12–15 milligrams (mg) per day
- zinc is important in adolescent girls because of its role in growth and sexual maturation.
- folate plays an integral role in DNA, RNA and protein synthesis. Thus, adolescent girls have increased requirements for folate during puberty
- vitamin C aids the absorption of non-haem iron, prevent anaemia from occurring

Adulthood

- after teenage years energy requirements are likely to be less and start to decline as women age. Energy intake is approx 1940 calories. Women should adjust their overall intake of food according to the level of physical activity and make sure that their diet remains balanced. It is important that women continue to eat a healthy diet as they get older. Eating more than the body needs will lead to weight gain. Carrying excess weight increases the risk of developing heart disease, diabetes and breast and endometrial cancer. Severe obesity can cause bone and joint problems, as carrying the excess weight can place immense strain on joints such as the knees.
- calcium intake reduced to 700 mg
- iron intake of 14.8 mg remains the same as adolescent girls up to the onset of menopause when it decreases
- zinc intake remains the same

- pregnancy and lactation: 200 Kcal energy intake increase and 6 g protein & 10 mg vitamin D increase.
- no routine increase in mineral intakes are considered necessary during pregnancy with the exception of iron which may be taken in the last trimester
- folic acid supplements in pre conception and in early pregnancy reduce the risk of NTDs

Old age

- energy requirements decrease in elderly women due to the combined effects of reduced activity and lower BMR
- protein requirements need to be maintained / increased due to illness
- older women should make sure to get enough calcium, vitamin D. Osteoporosis can affect older women after the menopause. This is where bone density reduces and the risk of fractures increases
- a balanced diet and an active lifestyle should help improve life expectancy and compress the period of chronic morbidity at the end of life
- iron needs are reduced because menstruation has ceased
- housebound elderly women should take Vitamin D supplements or ensure safe exposure to summer sunlight
- need for some nutrients may increase in the elderly, e.g. due to reduced absorption
- 6–8 glasses of water per day to prevent dehydration
- omega 3 fatty acids found in oily fish are thought to be beneficial in preventing CHD
- vitamin B12 found in fish, meat and poultry keeps the heart healthy
- vitamins B₃ and D may slow down the progression of Alzheimer's disease
- NSP needs are maintained to prevent bowel disorders

All other valid points will be given credit

[0] is awarded for a response not worthy of credit

Level 1 ([1]–[4])

Overall impression: basic

- displays limited knowledge of the nutritional needs of women during the life cycle
- limited analysis /may list several examples or focus on only one life stage
- quality of written communication is basic. The candidate makes a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

Level 2 ([5]–[8])

Overall impression: adequate

- displays adequate knowledge of the nutritional needs of women during the life cycle
- adequate analysis of three life stages
- answer which address only two life stages cannot achieve beyond this level
- quality of written communication is good. The candidate makes a reasonable selection and use of an appropriate form and style of writing.

Relevant material is organised with some clarity and coherence. There is some use of specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

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Level 3 ([9]–[12])

Overall impression: competent

- displays a good knowledge of the nutritional needs of women during the life cycle
- there may be some variation in the level of analysis in the different life stages
- competent analysis
- quality of written communication is competent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard to make meaning clear.

Level 4 ([13]–[15])

Overall impression: highly competent

- displays an excellent knowledge of the nutritional needs of women during the life cycle
- highly competent analysis of the three life stages at the top of this level
- quality of written communication is excellent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is extremely well organised with a highest degree of clarity and coherence. There is extensive use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of the highest standard and ensure that meaning is absolutely clear. [15]

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3 (a) Name one high risk food likely to cause food poisoning. (AO1)

Answers may include one of the following:

- meat
- poultry
- eggs
- milk and cream dishes
- rice
- seafood
- reheated dishes
- pre-packed salads/vegetables

All other valid points will be given credit

(1 × [1])

[1]

(b) Identify two groups of individuals who are particularly at risk from food poisoning. (AO1)

- children
- older people
- people who are ill
- pregnant women

All other valid points will be given credit

(2 × [1])

[2]

(c) Discuss safe practice when using high risk foods. (AO1, AO2, AO3, AO4)

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Answers may include some of the following points:

- care should be taken to prevent cross contamination, i.e. keep raw and cooked foods separate
- storage position in fridge – meat bottom shelf
– cooked foods on top shelf
- eggs and egg dishes stored in refrigerator at correct temperatures
- temperature control must be suitable for storing foods, e.g. high risk foods kept out of danger zone (5–63 °C). Fridge temperature should not exceed 4 °C
- refrigerators must not be overloaded
- air circulation around chilled food storage
- deep freeze cabinets should maintain a temperature of –18 °C or below/defrosted approximately every six months
- personal hygiene, e.g. thorough handwashing, not coughing or sneezing near food, covering cuts, use protective clothing
- nails – no varnish or jewellery – to be worn
- equipment should be clean and in good repair. Chopping boards should be plastic and colour coded to avoid cross contamination. Equipment should not be used for both cooked and raw meat, e.g. mincers
- separate preparation areas in kitchens i.e. for raw and cooked foods
- defrosting – high risk food must be defrosted thoroughly using correct procedure before cooking, e.g. 70 °C at the centre
- following relevant cooking and storage instructions
- reheating until piping hot all way through, do not reheat more than once, at least 72 °C
- cook meat thoroughly to destroy bacteria. Do not eat under-cooked poultry or meat products
- cool cooked foods as quickly as possible, if they are to be stored for future use
- always keep food covered and do not leave it standing around the kitchen
- wash all food thoroughly (preferably under running water), especially salads, fruit and vegetables that are to be eaten raw
- keep chilled foods cold between time of purchase and storage
- when using a microwave to reheat food, observe the standing times recommended by the manufacturers to ensure the food attains an even temperature before it is eaten
- keep foods (especially fresh meat and fish) for as short a time as possible, follow storage instructions and do not keep foods beyond their ‘Use by’ or ‘best before’ date

All other valid points will be given credit

[0] is awarded for a response not worthy of credit

Level 1 ([1]–[3])

Overall impression: basic

- displays limited knowledge of safe practice when using high risk foods
- limited discussion/may list several examples
- quality of written communication is basic. The candidate makes a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is

little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

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Level 2 ([4]–[6])

Overall impression: adequate

- displays adequate knowledge of safe practice when using high risk foods
- adequate discussion of several examples
- quality of written communication is adequate. The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

Level 3 ([7]–[9])

Overall impression: competent

- displays good knowledge of safe practice when using high risk foods
- competent discussion
- quality of written communication is competent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard to make meaning clear. [9]

- (d) Discuss how the following factors may influence a parent's choice of food when doing the weekly shopping for the family.
(AO1, AO2, AO3, AO4)

Advertising

Answers may address some of the following points:

- TV/magazines/posters
- labelling, e.g. traffic light system to make healthy/informed choice
- organic
- no additives, i.e. e-numbers
- child branding – e.g. Disney characters, Tweenies-shaped pasta, Jolly Green Giant
- food to promote clearer complexions, i.e. five a day
- promotions, e.g. 50% extra free
- nutritional information, e.g. omega 3 for brain development, low fat, low sugar

Economic factors

Answers may address some of the following points:

- price of the food item
- store promotion – e.g. buy one get one free
- amount of budget allocated to food – limited budget less options/less treats
- fresh v frozen foods as frozen products are cheaper to purchase
- larger pack item may be purchased as better value
- named brands v store brand as the latter tend to be cheaper

Knowledge

Answers may address some of the following points:

- level of knowledge about nutrition will influence type of food, e.g. foods rich in protein and carbohydrates
- knowing the likes and dislikes of the family will influence choice as parent will mainly choose those foods the family are most likely to eat
- will read and understand the information in labelling, e.g. nut allergy
- awareness of terms such as genetically modified foods therefore less likely to choose
- will understand and have a knowledge about the role certain foods play in reducing risk of certain diseases, e.g. NSP and intestinal tract, fruit and vegetables and their antioxidant properties. Saturated fat and their role in coronary heart disease
- will understand and be aware of research into links between food choice and diet related disorders, e.g. CHD
- understanding of farming methods and animal welfare

All other valid points will be given credit

[1] For use of key phrase(s), [2] for adequate discussion, [3] for fuller discussion

(3 × [3])

[9]

- (e) Examine four risk factors for developing osteoporosis. (AO1, AO2, AO3, AO4)

Answers may address four of the following points:

Diet

- a diet lacking in calcium phosphorus and vitamin D can result in low peak bone mass due to poor absorption and synthesis of calcium by the body
- a diet with low levels of vitamin C and protein results in weak bone tissue: skeletal framework and strength resulting in fractures and weak bones
- a high intake of caffeine may result in calcium being excreted in the urine

Smoking

- causes low bone density which leads to a decrease in the parathyroid hormone thus reducing calcium absorption and oestrogen levels
- reduces body mass
- reduces the level of vitamin D in the body which is required for good bone health
- smokers are more likely to suffer peripheral vascular disease reducing blood supply to the bones

Alcohol

- excess alcohol damages the skeleton and increases risk of fractures and broken bones
- excess alcohol consumption may result in an individual consuming an inadequate diet

Physical Activity

- lack of weight bearing exercise causes poor balance and co-ordination and reduces muscle strength: resulting in poor bone density

Age

- bones become thinner with age/the older the person the greater the risk of osteoporosis

Gender

- women are at higher risk of osteoporosis than men due to lower bone density after menopause and hormonal changes

Race

- white/Asian women are at higher risk due to differences in bone mass and density

Medical Conditions

- low levels of sex hormones, e.g. testosterone and oestrogen increases the risk of osteoporosis
- conditions that affect the absorption of food such as Crohn's disease; coeliac
- conditions that cause low periods of mobility, e.g. arthritis result in muscle wastage and weakening
- hip fractures and other broken limbs leads to degeneration of bone tissue
- low body weight
- medication may cause loss of bone mass, e.g. cancer drugs

All other valid points will be given credit

[0] is awarded for a response not worthy of credit

Level 1 ([1]–[3])

Overall impression: basic

- displays limited knowledge of the risk factors associated with osteoporosis
- limited analysis/may list factors/may address only one factor
- quality of written communication is basic. The candidate makes a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear

Level 2 ([4]–[6])

Overall impression: adequate

- displays adequate knowledge of the risk factors associated with osteoporosis
- at least two risks must be addressed
- adequate analysis
- candidates who examine only two risk factors cannot achieve beyond this level
- quality of written communication is good. The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

Level 3 ([7]–[9])

Overall impression: competent

- Overall impression: competent
- displays good knowledge of the risk factors associated with osteoporosis
- competent analysis
- answers which address only three risks cannot achieve beyond this band
- there may be some variation in the level of analysis of four risk factors
- quality of written communication is competent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard to make meaning clear.

Level 4 ([10]–[12])

Overall impression: highly competent

- displays excellent knowledge of four risk factors associated with osteoporosis
- highly competent analysis
- quality of written communication is excellent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is extremely well organised with a highest degree of clarity and coherence. There is extensive use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of the highest standard and ensure that meaning is absolutely clear. [12]

Total

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33

100

