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FOREWORD

This booklet contains reports written by Examiners on the work of candidates in certain papers. **Its contents are primarily for the information of the subject teachers concerned**.

FOOD AND NUTRITION

GCE Ordinary Level

Paper 6065/01
Paper 1 - Theory

General comments

There was a wide range of scores for this paper. It was pleasing to note that there were several candidates who produced answers of a very high standard, demonstrating a thorough understanding of the subject matter and an ability to apply their knowledge. The weakest candidates showed that they were able to recall basic facts but were usually unable to give explanations or examples.

Candidates seemed to have had sufficient time to answer the required number of questions; there were few rubric errors, mainly in **Question 5**; candidates attempted all parts of the question instead of choosing three parts.

Scripts were usually well presented and handwriting was easy to read. There were, however, several instances of candidates not leaving a space between each part of an answer and not ruling a line across the page at the end in order to separate responses. It is not necessary to begin each answer on a new page but some distinction should be made to show where one answer ends and another begins. Attention must also be drawn to the fact that it is the candidate's responsibility to assemble answer sheets in the correct order. On a few occasions it was necessary to re-order sheets. At the end of the examination each candidate should complete the grid on the front cover to indicate which questions have been attempted. There is a clear instruction to this effect on the front cover of the question paper.

The mark allocations at the end of each question or part question are for guidance. They should help a candidate to decide how much detail is required in an answer.

Comments on specific questions

Question 1

(a)(i) Carbon, hydrogen and oxygen were known to be the elements from which carbohydrates are formed.

(ii) Most candidates were able to state that fat and protein also provide energy.

(iii)(a) It was expected that candidates would be able to give two facts about monosaccharides. Some stated that they are sometimes known as simple sugars and are the simplest form of carbohydrate; others noted that monosaccharides are the basic units from which all other carbohydrates are built. Credit was given to those who stated the formula for glucose or who stated that monosaccharides are soluble. Glucose, fructose and galactose were given as examples.

(b) Full marks were scored by those who stated that disaccharides are often referred to as double sugars because they are formed from two molecules of simple sugar, or two monosaccharides. A few candidates gave the formula for disaccharides. Lactose, maltose and sucrose were known to be examples.

(iv)(a) Non-Starch Polysaccharide was usually known to be another term for dietary fibre or roughage. Many candidates noted that it is indigestible so is an unavailable carbohydrate. One or two answers correctly noted that this is because the molecule has a complex structure which digestive enzymes cannot break down.

(b) Its use in the body was well known. It absorbs water, increases bulk and softens faeces making elimination easier. Peristalsis is stimulated so conditions such as constipation and diverticulitis are prevented.

(c) It was expected that specific foods would be given as examples of good sources of NSP. Green vegetables, apple skin, wholegrain cereals, wholemeal bread, brown rice, pulses and nuts were often noted.

(v) The digestion and absorption of starch was not well known. Candidates tended to give all the information they knew instead of selecting that which was appropriate to starch. Most candidates were able to state that salivary amylase acts on starch, converting it to maltose. Not many qualified their answer by stating that it works only on cooked starch. Unfortunately, many answers included no correct facts about digestion and absorption in the small intestine. It was expected that candidates would be able to state that on the duodenum, pancreatic amylase converts starch to maltose and that in the ileum maltase, from intestinal juice, changes maltose to glucose. This is absorbed by blood capillaries in the villi. Many candidates gave information on the digestion of sucrose and lactose; this could not be credited because the question referred to the digestion and absorption of starch.

(b)(i) There were many good accounts of the use of iron in the body. Full marks were scored by those who stated that iron produces haemoglobin, the red pigment in blood, which combines with oxygen to form oxyhaemoglobin. In this way oxygen is carried in the blood stream to cells where it oxidises glucose to produce energy.

(ii) It was generally known that a deficiency of iron can cause anaemia which is characterised by tiredness and a pale colour.

(iii) Sources of iron were well known. Liver, kidney, red meat, cocoa, egg yolk and green vegetables were the most frequently given examples.

(iv) Vitamin C was known to be important for the absorption of iron.

(c)(i) The majority of candidates were able to give several reasons for reducing the intake of sugar. It was known that sugar can cause tooth decay, diabetes, hypertension, obesity and coronary heart disease. It was seldom noted that breathlessness, lethargy and low self-esteem can also be associated with a diet which has a high sugar content.

(ii) It was disappointing to note that candidates were not always able to suggest ways to reduce sugar in the diet. It was expected that examples would have included the use of artificial sweeteners in tea and coffee, eating fewer sweets, cakes and biscuits, and drinking low calorie soft drinks. No-one suggested checking food labels to find out the amount of sugar contained in a product.

(d) The question focused on good eating habits and not on the provision of balanced meals for children. Many candidates suggested that from an early age children should eat with the rest of the family so that they could follow the example set by adults and that they should not be allowed to leave the table until the end of the meal. The importance of having breakfast was noted as was the need to have meals at regular times. It was sometimes suggested that food should be cut into small pieces to make it easier to eat and to encourage independence. Small portions should be served and the child encouraged to eat everything. Food should be varied and served attractively and water, rather than fruit juice, given with the meal. Most candidates noted that fruit and vegetables should be served to children and that eating between meals should be avoided. All valid points were credited.

Question 2

(a) Candidates were usually able to give some of the reasons for serving sauces with meals but limited their score for this part of the question because examples were not given to illustrate the reasons given. Sauces were known to add flavour, colour, moisture and interest to dishes. Some candidates correctly noted that some sauces bind together ingredients and that others counteract the richness of certain foods. The nutritional value of a dish is usually improved. It was expected that candidates would be able to state, for example, that serving apple sauce with pork counteracts the richness of the pork and that cheese sauce served with cauliflower adds flavour.

(b)(i) The method of making a roux sauce was not well known. Most candidates were able to gain marks for stating that margarine is melted before flour is mixed in and that milk must be added gradually while the mixture is stirred. It was, however, rarely noted that the roux must be cooked before the milk is added and that the pan must be removed from the heat before the addition of milk. Few candidates mentioned that the sauce must then be boiled in order to thicken it. An allocation of five marks for this part of the question suggests that a detailed answer is required.

(ii) Many ingredients were suggested to change the flavour of the sauce. They included cheese, onions, mushrooms, mustard, parsley, sugar, cocoa and brandy.

(c)(i) Most candidates correctly stated that a wooden spoon does not conduct heat so it will not burn the hand during the preparation of the sauce. Others noted that a metal spoon could scratch the pan or that the broader edge of a wooden spoon makes it more efficient.

(ii) Full marks were usually gained in this part of the question; candidates were aware that to avoid lumps in the sauce the liquid must be added gradually, off the heat, and that the mixture must be stirred continually at each stage of its preparation.

(d) It was a little disappointing to note that many candidates were not able to describe the effect of moist heat on starch. Full marks were achieved by those who stated that during the cooking of the sauce the margarine melts and is absorbed by the starch grains. The starch then absorbs the milk. When heated, the starch grains soften and swell; some of them burst thickening the sauce. The process is known as gelatinisation.

Question 3

(a)(i) There were many good accounts of how accidents can be avoided when storing and using knives. It was suggested that knives be kept out of the reach of children in a knife block or with the blade covered by a sheath and that they should not be put into water with other items when washing up in case someone is cut when reaching into the water. There was advice to use the appropriate knife for the task, to use a chopping board and to ensure that knives are kept sharp. Credit was also given for stating that full attention should be given to any processes involving knives.

(ii) Candidates were able to give sound advice on avoiding accidents when deep frying but no credit was given for general information on the method. It was advised that the pan must not be over-filled with oil or overheated and that the pan handle should be turned towards the stove. It was usually stated that food should be dried well or that there should be no water near hot oil. It was noted that food should not be thrown into the pan; it should be gently slid from the side. Again, all valid points were credited.

(iii) It was usually noted that plugs should be wired correctly and that there should be no bare wires. Some candidates stated that sockets should not be overloaded and that the appliance should be switched off and the plug removed from the socket before the appliance is dismantled or washed. Most answers included the advice that electrical equipment must not be touched with wet hands and that flexes should not be hanging over the edge of benches in case someone tripped. Better answers advised that the manufacturer's instructions should always be followed. No credit was given for points about the storage of electrical equipment since the question specifically related to the use of electrical equipment.

(b)(i) The information given on work surfaces was often a little disappointing. Credit could not be given to general statements about the importance of surfaces or keeping them clean. More precise information was required. Many candidates noted that surfaces should be smooth or should not have cracks because bacteria can accumulate and be transferred to foods and cloths. They should be cleaned before and after every task with hot (not warm), soapy water and should not be allowed to become cluttered with food or equipment. The use of disinfectants or anti-bacterial sprays was advised. Materials, for example marble and Formica, were suggested and the advice to protect the surface with a chopping board was frequently given. Some candidates correctly stated that there should be a work surface on either side of the stove and the sink to reduce movement and that the height of the work surfaces should be comfortable in order to reduce bending or stretching.

(ii) There were many excellent accounts on ventilation. It was well known that steam, smells, smoke and grease must be removed from a kitchen in order to make it a more comfortable place in which to work and to avoid damage to decorations. Heat must be allowed to move out and fresh air move in. This can be achieved by windows, cooker hoods, extractor fans and air conditioning units.

Question 4

(a) Candidates who chose to answer this question were usually able to list many of the nutrients in fish. Most of them mentioned protein but few qualified this by stating that it was HBV protein. Fat and the fat-soluble vitamins A and D were noted, as were iodine, fluorine, sodium and calcium.

(b) There were many accurate lists of points to note when buying fresh fish. No credit was given to information regarding the purchase of frozen fish. It was known that the eyes of the fish should be bright and bulging and that there should be plenty of scales, firmly attached. The tail should be stiff, the skin moist and the gills must be bright red. There should be no unpleasant smell. Many candidates were able to gain full marks for this part of the question.

(c)(i) The method of cleaning a whole fish was not often well described. The need for thorough washing was usually noted but often there was no other correct information. It was expected that the description would include the removal of scales, head and gills and the slitting of the belly to remove the internal organs. The tail and fins are often trimmed, not necessarily removed.

(ii) It was hoped that a simple description of the preparation of fish for freezing would have been given by more than a very small number of candidates. Full marks were awarded to those who stated that the fish should be separated into portions or meal sizes, then put into a plastic bag or plastic box. As much air as possible should be removed and the bag or box sealed. It can then be labelled to show the name of the fish, the quantity and the date.

(d)(i) The confusion between freezing and refrigerating continues. Many candidates are not sure of the difference and use the terms interchangeably. Fish can be kept in a freezer because at a temperature of -18°C or below bacteria are dormant. The water in the fish is frozen so it is unavailable for bacterial growth.

(ii) There are several methods of preserving fish other than freezing. Refrigerating and cooking are not acceptable answers.

Canning can be used because the heat used during the process destroys bacteria. The can is sealed and prevents the entry of further bacteria. In drying, water is removed leaving food which is too concentrated for bacteria to use therefore they are unable to multiply. When fish is salted, water is removed from both the fish and the bacteria by osmosis. Again, the food is too concentrated for bacteria to use.

Fish can be pickled. First the water is removed by osmosis when salt is put over the fish. The water is replaced by vinegar (acid) and bacteria are unable to multiply in acidic conditions.

Smoking can be used to preserve fish. First the fish is salted and the water removed by osmosis. It is then hung over smoking wood which deposits a layer of phenol on the surface of the fish, inhibiting bacterial growth.

Marks were awarded for naming two methods of preservation other than freezing and for giving additional facts about each of the methods named.

Question 5

(a) Few candidates gave definitions of pulses and nuts and rarely gave named examples. Some facts on nutritive value were occasionally noted and it was occasionally mentioned that pulses need to be soaked to soften them before use. It was expected that specific uses would be given; lentils, for example, can be used in soup and red kidney beans in chilli con carne. There were many possible examples of the use of nuts in cooking. Peanuts are used in sauces; almonds are one of the main ingredients in marzipan and can also be used for decorating cakes. An important use for both pulses and nuts is in vegetarian cooking because both supply LBV protein. Again, it is important to stress that only specific information gained marks.

(b) Sadly, the majority of candidates who chose to answer this part of the question seemed to misunderstand what was required. There are many uses of sugar in the preparation of meals but only the use for sweetening was mentioned in the majority of answers. It was expected that sugar would be known to be a preservative in jam making, it is used to begin the fermentation of yeast in bread-making and is creamed with margarine in order to trap air when making rich cakes. Since it is a carbohydrate it increases the energy value of dishes. There were many other possible uses of different types of sugar; mention could also have been made of the fact that sugar caramelises on heating, making it useful for browning baked dishes and for the preparation of confectionery. Many candidates gave lengthy accounts of the disadvantages of using sugar but this information did not address the question.

(c) A few candidates gave definitions of herbs and spices but the majority of answers simply informed that herbs and spices are used for flavour and colour in cooking. Named examples of herbs and spices were rarely given and specific examples of their use were generally omitted. It could have been stated, for example, that parsley is often used to flavour white sauce when it is an accompaniment to fish, mint is served with roast lamb and ginger is used to make gingerbread or biscuits. Any valid examples of the use of herbs and spices in meal preparation were given credit. One or two candidates noted that because their flavours are strong they should be used sparingly and that fresh herbs and spices give the best flavour.

(d) It was well known that left-over foods should be cooled quickly, covered and stored in the refrigerator. Candidates did not always explain that this was to reduce the risk of contamination and to slow down the multiplication of bacteria. Few answers linked the careless use of left-over foods to food poisoning. Examples of dishes made with left-over foods were occasionally given; fishcakes made with cooked fish, shepherd's pie with roast meat, bread and butter pudding with stale bread and trifle with dry cake were some of them. The importance of reheating to a temperature of at least 63˚C was not acknowledged although several candidates correctly stated that food should not be re-cooked because this causes protein to toughen, making the dish unappetising and difficult to digest. It was sometimes noted that meat should be cut into small pieces to allow heat to penetrate quickly and that moisture and additional flavours should be added because they may have been lost during the first cooking.

Question 6

(a) The opening statement of the question is that meals should be well-balanced. Other points to consider apart from those relating to nutrition were wide-ranging and could include the cost of ingredients and the time, resources and food available to the cook. Some candidates noted that the weather could influence food choice as could the occasion or the time of day. Every meal should be varied in colour, flavour and texture and should be within the capability of the cook. Credit was given for noting that healthy eating guidelines should be observed. Candidates were expected to illustrate their answer by explaining the importance of each of the factors mentioned. It could have been stated, for example, that if time was limited, meals could be planned which made use of a microwave oven or a pressure cooker, or cold meals could be planned. Seasonal foods or ingredients already in store could be chosen to save money. Full marks could only be scored if each stated point was explained.

(b) Some candidates had extensive knowledge of how vegans can be supplied with High Biological Value (HBV) protein. Most answers mentioned that soya beans are the only plant source of HBV protein and that soya can be used for a variety of products such as milk, flour, tofu and tempeh. Textured Vegetable Protein (TVP) is made from soya beans which have had their oil removed. The remaining part is spun to make fibres which are then formed to resemble the texture of meat. TVP can be shaped into sausages, burgers, chunks or mince. Commercial products such as Quorn, although meat-free, are not suitable for vegans because the fibres are bound with egg, an animal product. Low Biological Value proteins are usually obtained from plant sources such as cereals and pulses. Many candidates gave very sound explanations of how, by mixing different LBV protein foods the quality of the protein can be improved. The concept of complementing proteins in order to compensate for missing indispensable amino-acids was understood well and good examples of combining protein foods were included in many answers. The most popular examples were baked beans on toast and lentil soup and bread. HBV and LBV foods can also be mixed in the same meal but this fact was rarely mentioned. An example such as spaghetti bolognese made with TVP mince could have been given.

(c) Candidates seemed to have little understanding of how vitamin C can be conserved when preparing, cooking and serving green vegetables. Many references were made to peeling vegetables thinly, suggesting that candidates had not read the question carefully or had written everything they knew about preventing the loss of vitamin C. The majority of candidates were able to state that vitamin C is water soluble but few other facts were known. It was expected that candidates would be able to note that vitamin C is destroyed by heat so it should be cooked quickly, it is water soluble so should not be soaked and should be boiled in a small amount of water and that it can be oxidised if vegetables are prepared well in advance of cooking or are not served immediately. A few candidates stated that bicarbonate of soda should not be added to the cooking water but were unable to explain that vitamin C is acidic and is neutralised by the alkaline bicarbonate of soda. It is not enough to state that actions noted either retained or destroyed vitamin C. Only precise information could be credited.

Question 7

(a) Good reasons for preserving food were usually given. Popular suggestions were that preserved food prevents waste because spoilage is prevented; money can be saved because if there is a glut of fruit, for example, when it is in season it can be kept for times when it is unavailable. Food can be preserved in a variety of ways and can be more easily transported, enabling the produce of other countries to be enjoyed. Answers were good and many candidates scored full marks for this part of the question.

(b) The aims of preservation are threefold. Firstly, it prevents food spoilage by destroying micro-organisms or by halting enzyme action. As many of the qualities of fresh food as possible should be retained; the flavour, colour, texture, appearance and nutritive value should be affected as little as possible. Finally, the re-entry of further micro-organisms should be prevented by sealing the food well and by creating conditions which do not favour their growth. It was expected that answers would include more than one of these aims but candidates often repeated the reasons they had given for preservation in the previous part of the question.

(c) Micro-organisms require warmth, moisture and food in order to thrive. They do not multiply in high concentrations of salt and sugar or in acidic conditions. Good answers named methods of preservation which could be used for fruit and indicated how the growth of micro-organisms would be prevented in each case. Methods of preservation mentioned included bottling, canning, salting, pickling, jam making, drying and freezing. Refrigerating, although frequently mentioned as a method of preserving food, does not prevent the multiplication of micro-organisms; it only slows down the process so cannot be considered to be a method of preserving fruit. Examples of fruits which could be preserved by each named method were not required; similarly no credit was given for describing how the methods were carried out.

(d) Candidates usually described jam making or freezing although it was evident from many of the descriptions that the processes were unfamiliar. It was expected that a description of the preparation of the fruit would be given, followed by a detailed account of the process. No explanations were required. The best descriptions gave accounts of removal of air, sealing and labelling.