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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

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| <p>Paper 6065/01 Paper 1 - Theory</p> |
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General comments

Candidates seemed to have had sufficient time to answer the required number of questions. There were few rubric errors. Candidates achieved varying degrees of success; some scripts showed outstanding levels of knowledge and understanding.

The presentation of scripts was generally good. There were, however, a number of candidates who did not indicate clearly the number of each question attempted and did not complete the grid on the front of the Answer Booklet as requested. One of the instructions clearly printed on the front cover of the Answer Booklet is that staples must not be used. Despite this, staples were used by a number of Centres to attach additional sheets; they make the turning of pages difficult as do tightly knotted strings which often tear through the paper as the script is being handled. It is important that candidates ensure that additional sheets are assembled in the correct order. There is no need to begin each question on a separate sheet of paper but it is important that either a line is ruled across the page between questions or a few lines are left to indicate the end of one answer and the start of the next.

Candidates should be reminded to read questions carefully. On many occasions, lengthy answers were produced which, although factually correct, were not relevant to the question so valuable time was wasted. Mark allocations and the amount of space given for the answer are intended to indicate the amount of detail required in an answer. These are often not heeded.

Candidates, on the whole were able to produce factual answers to direct questions and could generally justify their responses. Problems were, however, encountered when questions required the selection of relevant information. Many candidates found this difficult, suggesting that facts are learnt without being understood.

Although time-consuming, many candidates chose to write at length on a topic rather than select appropriate information which would answer the question as it was set out in the Question Paper.

Comments on specific questions

Question 1

- (a) Most candidates were able to name four examples of fats and four examples of oils. Brand names were not credited. The range of named vegetable oils used in meals was wide. Some candidates named fish liver oils and were given credit but it was not appropriate to name oily fish since this information was not asked for.
- (b) It was well known that fats are solid and oils are liquid at room temperature.
- (c) There were many possible functions of fats and oils to choose from. Candidates noted the production of energy, warmth, insulation, protection of internal organs and the conveyance of Vitamins A, D, E and K. Some correctly stated that fats form part of the structure of the cell membrane or that they form a fuel reserve.

- (d)(i)(ii)** Many candidates were unable to explain the terms saturated and polyunsaturated fat. Full marks were scored for stating that saturated fat has the maximum number of hydrogen atoms and that there are only single bonds in the structure. Polyunsaturated fat has more than one double bond and is able to hold more hydrogen atoms. Some candidates used diagrams to give information.
- (iii)** It was hoped that candidates would be able to state that essential fatty acids must be included in the diet because they cannot be manufactured in the body.
- (e)** It was disappointing that many candidates were unable to give information on the digestion and absorption of fat. Full marks would have been scored for stating that fats are digested in the duodenum and that they are emulsified by bile. Emulsification is necessary to break the fat into tiny globules, increasing the surface area. Lipase breaks down fat into glycerol and fatty acid. 1g of fat has an energy value of 9 kcal or 37 kJ.
- (f)** There were many very good accounts of the problems associated with a high intake of fat. Most candidates noted that excess fat is stored in the body causing obesity and that if the fat is saturated fat, the cholesterol level in the diet increases. Deposits of cholesterol in the arteries cause narrowing or blocking. The result could be CHD, a heart attack or a stroke. Obesity may lead to breathlessness, lethargy and a lack of self-esteem.
- (g)** The majority of candidates gave Vitamin A and Vitamin D as examples of fat soluble vitamins. They were able to give animal sources (retinol) and plant sources (carotene) of Vitamin A and noted that one of its functions is to form visual purple which enables the eye to perceive images in dim light. A deficiency causes night blindness. Other functions are the maintenance of mucous membranes and healthy skin. It also promotes growth. Sources of Vitamin D were well known and the importance of ultra violet light from the sun was recognised. The vitamin was known to aid the absorption of calcium and to be important for the formation and maintenance of bones and teeth. A deficiency causes rickets in children and osteomalacia in adults.
- (h)(i)** Everyone should have a balanced diet so credit was given for explaining the special nutritional needs of elderly people. Many candidates incorrectly emphasised the fact that elderly people should have soft food because they have no teeth; this is not necessarily so. It was expected that protein would be mentioned since it is important for repair and maintenance and that calcium and phosphorus are required to prevent osteomalacia. Vitamin D will be needed to absorb calcium. Because elderly people are less active, less energy-giving foods are needed. Fat should be reduced because it can be difficult to digest and poses an increased risk of CHD, sugar should be reduced because it could cause diabetes or may lead to weight gain, and salt should be limited since it is associated with hypertension. Elderly people are prone to constipation, as many candidates correctly noted, so a good supply of NSP should be included in their diet.
- (ii)** A very active teenager, on the other hand, will require starch and fat for energy. At least a third of energy should come from fat since it is more concentrated. Additional thiamine should be included in the diet since its function is to release energy from carbohydrates. Protein is essential since teenagers undergo a growth spurt. For the same reason additional calcium, phosphorus and Vitamin D will be needed. Since the question states that the teenager is very active additional supplies of water and salt should be included in the diet to compensate for the water and salt lost in perspiration. The majority of candidates correctly noted that teenage girls require iron to compensate for iron lost during menstruation. Iron is also necessary for the transport of oxygen for cell respiration. An active teenager will require more oxygen for the production of energy. Additional Vitamin C will be needed for the absorption of iron.

Question 2

- (a)** The only other ingredients required for a fatless sponge when three eggs are used are 75g plain flour and 75g sugar, preferably caster sugar, but credit was given for the naming of sugar.
- (b)** There were many well-explained descriptions of the making and baking of a fatless sponge cake. A few candidates described the making and baking of a creamed mixture, overlooking the fact that fat was being incorporated. Baking temperatures were not well known so the marks allocated for stating the baking temperature and time were not normally gained. The question asked for the information to relate to a named cake but candidates seldom gave that information. It was expected that a Swiss roll or a sponge sandwich cake would be named since baking temperatures and times vary according to the cake.

- (c) Most candidates were unsure of the reasons for a close-textured sponge cake. The most frequently given answer was that the eggs and sugar had been insufficiently whisked. Credit was also given for noting that air may have escaped during the folding in of flour if the process was carried out carelessly or if folding had continued after all the flour had been incorporated. A few candidates correctly noted that the cause may have been too low an oven temperature.
- (d) There were many excellent descriptions and explanations of the changes taking place when a fatless sponge cake is baked. Good answers noted that air expands and pushes up the cake mixture and steam from the egg evaporates adding to the raising. Protein coagulates at 60°C and sets the risen shape. The sugar caramelises in the dry heat of the oven giving a brown colour; starch grains absorb water, swell and gelatinise. Dry heat causes dextrinisation so a brown crust is formed on the surface of the cake. It was not necessary to give all of the information on changes during baking to gain full marks.

Question 3

- (a) Most candidates were able to gain full marks for naming four cereals. As expected the most common examples were wheat, maize, oats, barley and rye although millet was occasionally mentioned. It was not acceptable to name breakfast cereals or pasta.
- (b) There were many appropriate reasons for the importance of cereals. They are easy to grow, they can be dried and stored and are cheap to buy or produce. Cereals are versatile and can be used in both sweet and savoury dishes. They are staple foods, being good sources of carbohydrate to provide energy. Many candidates stated that cereals supply NSP and protein; better answers supported these facts by adding that NSP is only found in those cereals which retain the outer layer and that the protein in cereals is of Low Biological Value. Similarly, B Vitamins are only present in whole grain cereals. The importance of precise information cannot be overemphasised; candidates who give general information, such as 'cereals contain protein' cannot gain full marks.
- (c) Five marks were allocated to information on the storage of cereals; most answers consisted of only one or two facts. It was well known that cereals should be stored in a dry place to prevent the growth of moulds and that airtight containers will prevent the entry of both moisture and insects. Few candidates mentioned that old and new stock should not be mixed to prevent the spread of insects or 'off' flavours or that stock should be used in rotation to prevent waste. It was rarely noted that stock should be inspected regularly in case of attack by insects or that containers should be labelled to avoid confusion. All valid points were credited but full marks could only be awarded if explanations were given.
- (d) It was surprising that a large number of candidates were unable to state that gluten is a protein found in wheat flour. Full marks were available for giving that information. Most answers included the fact that gluten is responsible for the elasticity of dough but were unclear about the development of gluten. Good answers noted that gluten absorbs water and its elasticity is developed during kneading. It is able to hold pockets of carbon dioxide which are produced during fermentation and will stretch as the gas expands on heating. Being a protein, gluten coagulates in the heat of the oven, forming the framework of the bread product. A few candidates correctly stated that flour with a high gluten content, such as Canadian Spring wheat which contains 10% protein, should be used for breadmaking.

Question 4

This was one of the most popular questions and candidates who chose to answer it usually scored well.

- (a) Rubbing in was known to refer to the rubbing of fat into flour when making shortcrust pastry, scones or plain cakes such as rock buns. It is carried out using thumbs over fingertips since these are the coolest parts of the hand. Lifting the hands high above the bowl helps to aerate the mixture. The process should stop when the mixture resembles fine breadcrumbs to avoid melting the fat. Shaking the bowl will bring large pieces of fat to the top.

- (b) This section was the least well answered because there was usually insufficient detail. Some candidates chose to explain how to carry out the blending process by describing how a starchy powder is mixed with a cold liquid to separate the grains and to avoid lumps in the finished product. A wooden spoon was recommended because of its broad base. The paste must be smooth before the addition of boiling liquid. Examples of blending were in custard making or the thickening of soup with cornflour.
- Many answers involved the alternative use of the term blending. A description of the use of a free-standing blender or liquidiser was given. It was usually suggested that soups or vegetables could be made into smooth liquids. Marks were often limited because no instructions were given for carrying out the process. It was hoped that candidates would recommend that the goblet should not be overfilled, to prevent leakage when the machine is in operation and that large pieces of food should be broken up to prevent the jamming of the blades. Some candidates correctly suggested that the machine must not be used for long periods so that the motor does not overheat.
- (c) Blanching was the least well explained term. Again there were two possible explanations. Some candidates explained that the skin of almonds, for example, can be removed by blanching. They are covered with boiling water, drained, then covered with cold water. The skins can then be rubbed off. Offal can be blanched by covering with cold water, bringing to the boil and then straining. The alternative explanation of the term concerns the preparation of vegetables before freezing. The vegetables must be prepared according to kind. They are plunged into boiling water to halt enzyme activity. The time depends on the vegetable. After draining, the vegetables can be packed, sealed and labelled before freezing. Either of the methods of blanching was acceptable.
- (d) Most candidates were able to explain how to make a puree. Fruit and vegetables were the commonest examples although some candidates correctly noted that baby foods are often prepared in this way. Credit was given for stating that either an electric blender or a sieve could be used. In either case the result would be a smooth pulp. Seeds and skins would not pass through a sieve but if a blender was used the skins and seeds would be broken down. Additional marks were scored by those candidates who warned that the goblet should not be overfilled in case the contents overflowed and caused burns.
- (e) Many candidates had difficulty in explaining how to sauté, although an appropriate example was usually given. The most popular were potatoes, mushrooms and onions. Full marks were gained by those who explained that small pieces of food are shaken in a small amount of hot fat in order to partially cook and to brown.

Question 5

- (a) It was expected that candidates would be able to give a range of ways in which fresh fruit may be included in family meals. They can be used as a garnish, a drink and as soup as well as forming part of a hot or cold dessert, a pie or a cake. Examples were given of their use in salads, pizza and savoury dishes, for marinating and for accompanying meat. There were other appropriate uses but in each case full marks could only be gained if a named example of each of the stated methods was given. Many candidates gave very limited responses by limiting their examples to cold desserts. The question asked for ways of using fresh fruit; making a cold dessert is just one of the ways.
- (b) A great variety of suggestions were given for choosing and purchasing fresh fruit. It was frequently advised that fruit should have an appropriate colour and smell and be ripe or just under ripe. It was well known that damaged fruit will not contain as much Vitamin C because it is destroyed when the fruit is bruised. Most candidates noted that it is more economical to buy fruit in season but that large quantities should not be purchased unless they can be used quickly because generally fruits do not keep well. There were other acceptable points to consider although to gain maximum marks every point needed to be supported by a reason.
- (c) It was pleasing to note that many candidates achieved high scores for this part of the question. Nutrients found in fresh fruit include Vitamin C, Vitamin A, NSP, sugar, fat and water; credit was given for identifying a function of each of the named nutrients and for giving an example of a fruit in which the nutrient is found. Full marks were gained by those who correctly identified and gave further information on four nutrients.

Question 6

- (a) Most candidates chose to answer the section on the care and use of the microwave oven. They noted that its functions include defrosting, cooking and reheating and that because they heat food quickly they are economical on fuel. It was stated that glass, china and plastic containers could be used but that metal containers or crockery with gold decoration must not be used because the metal will arc and damage the microwave oven. The need to stir foods during cooking was mentioned in order to avoid 'hot spots' since heating is not always even. The disadvantages highlighted were that only small amounts can be cooked or reheated at once, thick pieces of food cannot be penetrated by microwaves, and food neither turns crisp or brown. There were many other appropriate points on the use of a microwave. It was normally suggested that the oven should be wiped out with warm, soapy water to remove splashes. Abrasives would damage the inner surface.
- (b) Steaming was known to be a long, slow method of cooking; it produces light, easily digested food. Sponge puddings and suet pastry are lighter when steamed than when baked. Many candidates noted that there is less loss of water soluble vitamins because the food is not immersed in water. Steaming is economical of fuel because several dishes can be cooked at once in a tiered steamer which uses only one burner. The process needs little attention except to replenish the boiling water from time to time. Because the method is slow there is little chance of overcooking food. The kitchen, however, is hot for a long time and there can be a steamy atmosphere which is not pleasant to work in. It is always difficult to test whether food is cooked because puddings must be covered with foil or greaseproof paper to prevent the surface from becoming soggy. Steamed food is often lacking in flavour and colour because these qualities are not developed during the process.
- (c) The majority of candidates gave very competent accounts of the increased use of convenience foods in meal preparation. Most mentioned that working women have less time for preparing meals so tend to choose convenience foods which save time, effort and energy. They are easy to store and are readily available in a wide variety, both sweet and savoury. They allow foods to be served which may be beyond the capabilities of the cook and ensure that consistent results are achieved. Less emphasis was given to the disadvantages of convenience foods, they can be expensive and portion sizes are often small. Nutritionally they tend to be high in salt, sugar and saturated fat and low in NSP. They lose some nutrients during processing; usually additives to enhance colour, flavour, texture and keeping quality are present, the long term effects of which are uncertain. It is important that when answering questions of this nature candidates do not focus on advantages and fail to acknowledge disadvantages.
- (d) There seemed to be some confusion on the part of some candidates between refrigeration and deep freezing. The terms 'refrigerator' and 'deep freeze' were used interchangeably as if they were different names for the same piece of equipment.

Consequently, there were a number of incorrect responses because each of the points made referred to the advantages or disadvantages of owning a refrigerator. There were, however, many very good accounts of the advantages and disadvantages of owning a deep freeze. Mention was usually made of the fact that food can be stored for emergencies, shopping can be done less often and seasonal foods can be enjoyed throughout the year.

There were many important points to be made and many candidates demonstrated a sound knowledge of the topic. The usual disadvantages were that a deep freeze takes up space in the kitchen and uses electricity constantly, an added cost. Although meat can be stored safely in a deep freeze it must be completely defrosted before cooking so that any bacteria can be destroyed by the heat.

It was often mentioned that if a power cut lasted a long time the contents of the deep freeze would be wasted; others noted that defrosting is a tedious, time-consuming task. Again, there were many valid points and all were credited.

Question 7

Most candidates chose to answer this question, with differing degrees of success. The principal observation was that candidates failed to give precise facts in their answer. It is not appropriate at this level to use the term 'germs' rather than bacteria; similarly, 'to keep you healthy' is not a precise explanation for a course of action.

- (a) It was expected that candidates would be able to name three examples of bacteria which cause food poisoning. Salmonella, E.Coli, Listeria, Clostridium, Campylobacter and Staphylococcus are a few of them. Full marks were gained by those candidates who were able to name a food which could be contaminated by the bacteria mentioned. It was sufficient to state that Salmonella bacteria can be found in poultry or that E. coli bacteria can be found in raw meat.
- (b) The possible steps to be taken when preparing, cooking and storing food to reduce contamination are numerous. Kitchen cleanliness, thorough cleaning of utensils in hot, soapy water, sterilisation of cloths and the disposal of waste could have been discussed. Many points on personal hygiene were appropriate as were points on the safe storage of perishable foods in the refrigerator. Steps which should be taken to prevent cross contamination when preparing food were relevant as were guidelines for defrosting high risk foods. The importance of cooking food thoroughly in order to destroy micro-organisms should have been included. The most successful candidates were able to give temperature for freezing and refrigerating as well as the temperature which should be reached, for example, in the centre of a piece of meat to ensure that bacteria have been destroyed.

High marks could only be scored by those candidates who gave reasons for each of the points made. Some responses to this section were very short for a part question to which twelve marks were allocated. Candidates should be reminded to use the mark allocation for guidance.