

## **Food and Nutrition**

### **Unit 1 Paper 02**

#### **SECTION I – MODULES 1, 2 and 3**

##### **Question 1**

1. The senior students at our school have embarked on a project to assist the school's canteen operator to offer improved quality meals.
  - (a) (i) It is important for adolescents to have adequate **protein** and **calcium** in the diet. Outline THREE reasons why EACH of these nutrients is essential. [ 6 marks]
  - (ii) Suggest THREE combination dishes that are rich in calcium and protein. [ 3 marks]
  - (iii) Select ONE of the dishes in (ii) above and describe the process of its digestion in the mouth and the stomach. [ 6 marks]
- (b) (i) Identify FIVE guidelines which should be posted in the food storage area to allow for the proper storage of dry goods. [ 5 marks]
- (ii) Differentiate between cleaning and sanitizing of kitchen utensils and explain why EACH is important to health and safety. [ 10 marks]
- (c) (i) Outline TWO changes that occur during the cooking of EACH of the following:
  - a) Eggs
  - b) Cheese [ 4 marks]
- (ii) Using THREE examples, explain how knowledge of the properties of eggs and cheese can be used in cooking. [ 6 marks]
- (iii) State FIVE precautions that the canteen operator can implement in order to prevent burns AND electrocution in the kitchen. [ 5 marks]

**Total 45 marks**

(1) (i) Three reasons why protein is essential in an adolescent's diet are:

- adolescents are growing individuals and protein is therefore important as it serves <sup>to</sup> building and repair and maintain tissues
- adolescents need protein as it serves as an energy source when carbohydrates are not adequate
- proteins are found in every part of the body; hair, skin etc and to keep healthy it is a requirement.

Three reasons why calcium is essential in an adolescent's diet are:

- adolescents have just gained their permanent teeth in the childhood stage and calcium is needed to strengthen them
- adolescents are growing individuals and thus need calcium for the growth and repair of their bones
- adolescents are most athletic individual and to allow flexibility and agility strong bones are required thus calcium

(ii) Three combination dishes that are rich in calcium and protein are:

- Salmon sandwich  $\rightarrow$  (Kutter has bones) prepared with the tin salmon and thus includes the bones)
- Cheese omelet ✓ -
- Milk custard. ✓

(iii) Digestion of a Salmon Sandwich :

→ In the mouth, mechanical digestion termed chewing crushes the food particles into small pieces, during which saliva containing salivary amylase, mucus and ~~KHCO<sub>3</sub>~~ sodium bicarbonate is secreted; the mucus moistens and lubricates the food allowing tasting, the sodium bicarbonate maintains a pH of 6-7 so as to facilitate the breakdown of starch in the bread to maltose done by the salivary amylase.

→ In the stomach, mechanical digestion continues, however is now termed churning as the food is slammed against the wall of the stomach, here gastric juice is secreted by the stomach wall and contains hydrochloric acid, renin and pepsin and mucus; the mucus moistens and lubricates the food, the hydrochloric acid changes the pH to 1-2 denaturing the salivary amylase and facilitating the breakdown of the protein in salmon to polypeptides then to peptides by the renin and pepsin.

b) (i) Five guidelines which should be posted in the food storage area to allow proper storage of dry goods are:

- No eating <sup>or drinking</sup> allowed → food may throw away encouraging rats and other harmful creatures
- ~~No~~ Keep products tightly sealed → exposure to air may cause food spoilage
- Do not ~~interfere~~ interfere with thermostat control →

this may cause food spoilage as the temperature is not warm enough etc  
• No liming → this may lead to accidental hitting over of material some stored  
• Unauthorized personnel not allowed → persons may contaminate the goods want to

(ii) Cleaning is the process of removing visible debris from the utensils and may be done using water and soap and a sponge whereas sanitizing is the removal of bacteria and germs which are invisible to the naked eye and may be done using hot water bath or mild bleach solution.

Cleaning is important as one may be allergic to a particular food and so washing a utensil before use is helpful to prevent an allergic reaction, thus all in all it prevents contamination of other areas.

Sanitation may kill germs, etc that can cause various diseases and thus is of importance if these microorganisms are to be stopped and diseases are to be controlled.

c) (i) (a) Two changes that occur during the cooking of an egg are:

- the translucent egg white becomes white and opaque as the proteins it contains ~~keep~~ coagulates
- followed by the coagulation of the protein in the egg yolk which cause the yolk to become a lighter yellow - upon overcooking when frying the yolk may become rubbery and when boiling a blue-black ring forms around it.

c) (ii) (b) Two changes that occur during the cooking of cheese are:

- the proteins ~~coagulates~~ cheese is said to melt and becomes stringy
- upon further cooking, overcooking may be caused resulting in the cheese becoming stiff and rubbery and the oil content may disperse causing the food to become loaded with this oil

(iii) Three examples of how the knowledge of the properties of eggs and cheese can be used in cooking are:

- egg protein ~~coagulates~~ thus causing it to pull together, thus eggs may be used as a binding agent and so when preparing <sup>baked</sup> mac and cheese <sup>eggs</sup> are added to hold the components together thus a square solid piece can be cut.
- eggs capture air when ~~whisked~~ → thus it is used as a raising agent in <sup>whisked</sup> cakes as when it captures air during whisking causes the cake to be light and fluffy.
- cheese becomes rubbery when overcooked thus when being added as a topping eg on pizzas, casseroles, mac and cheese pies, etc must be added about five minutes before the dish is finished.

(iii) Five precautions that the canteen operator can implement in order to prevent burns and electrocution in the kitchen are

- Keep electrical gadgets away from water outlets.
- ensure that caution is taken during frying to prevent splashing of the oil.
- keep fabric away from the stove area.
- handle the oven with care as the steam may cause severe burns.
- ensure the voltage required by the electrical appliance is provided by the electric outlet as failure to do this may result in a power surge leading to electrocution.

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#### Comments on Responses to Question 1

1 (a) (i) This candidate was awarded full marks because the following points were given

- Building of tissues, repairing and maintaining tissues, and as a secondary source of energy
- Calcium is needed for strengthening teeth, growth and repair of bones and to allow for the flexibility and agility of bones

1 (a) (ii) This candidate was awarded full marks for the combination dishes because the dishes provided were all combined rather than two or more different dishes to give a rich source of calcium and protein. For example, a custard is a combination of milk and eggs along with other ingredients. This dish would supply sufficient calcium and protein.

1 (a) (iii) Digestion of a salmon sandwich. The student was able to clearly outline that mechanical digestion begins in the mouth where the mucus is responsible for moistening the food and the enzyme salivary amylase is released to breakdown the starch. The food enters the stomach where the food is churned by the stomach walls and the food mixes with the gastric juices. The enzyme pepsin is released and hydrochloric acid provides an acid medium for the enzyme to work in, and it activates the salivary amylase.

1 (b) (i) The candidate received four out of five marks for the guidelines for storage of dry goods because the following points were clearly stated. No eating or drinking allowed as this may cause harbourage of rodents such as rats. Food products must be tightly sealed as exposure to air may cause food spoilage. The correct temperatures for storing food must be adhered to and no unauthorized person should be allowed to enter the area where goods are stored as they may contaminate the goods. Insects, rodents, incorrect temperature, air and physical contaminants can all contribute to food spoilage.

1 (b) (ii) This candidate was awarded full marks because there was a clear distinction between cleaning and sanitizing. The student was able to state that cleaning is the removal of visible dirt using soap water and sponge while sanitizing is the removal of bacteria/germs which are invisible using a sanitizing agent. Both are important to health and safety because they remove substances that persons may be allergic to and prevent contamination while sanitation will destroy germs/microorganisms that can cause various diseases.

- 1 (c) (i) & (ii) The candidate was able to identify the changes that occur in the cooking of cheese and egg. The candidate adequately explained how knowledge of the properties of eggs and cheese could be used in cooking, providing clear examples to support the explanation.
- 1 (c) (iii) The candidate gained full marks because both electrocution and burns were addressed and relevant precautions related to burns and electrocution were clearly stated.