FAQ'S

Q1. Define cooking.

Ans: Cooking is the process of producing safe and edible food by preparing and combining ingredients, and (in most cases) applying heat. Cooking is a means of processing food, without which many foods would be unfit for human consumption.

Q2. What are the main purposes of cooking foods?

Ans: The main aims of cooking of foods are: (i) To make the food attractive and palatable (ii) To make the food digestible (iii) To introduce variety in meals (iv) To enhance the availability of some nutrients (v) To destroy microorganism (vi) Increasing consumption of food/Edibility (vii) Concentrate nutrients

Q.3. Explain briefly how cooking improves the digestibility of the food?

Ans: Cooking makes the food soft and tender, thus makes it easy and quick to digest. For example, after cooking carbohydrates present in food become easier to digest to a certain extent. Similarly proteins coagulate (e.g egg protein) on cooking which makes the digestion simple. Foods are consumed mainly in order to avail the vital nutrients for proper and normal metabolism of our body. This is achieved by digestion of the food and its absorption. However, many of the nutrients contained in foods are not readily accessible prior to cooking and thus, cannot be easily digested by the body. For example, the enzyme amylase breaks down the polysaccharide starch into its monomer glucose constituents, which can easily digested. Cooking foods containing starch (e.g., cereals and vegetables), prior to consumption initiates the breakdown of the polysaccharide, thus, aiding the action of amylase and the consequent digestibility of the carbohydrate component of the food.

Q.4. What are various methods applied for the cooking of the food?

Ans: The various methods of cooking are as under:

(i) frying (ii) boiling (iii) simmering (iv) grilling (v) canning (vi) steaming (vii) roasting (viii) baking

Q.5. What is canning?

Ans: Heating of foods in hermetically sealed containers is known as canning. Nicolas Appert, a French confectioner was the first to demonstrate canning of foods. Canning requires a medium for heat transfer e.g oil or water. Time and temperature combination during canning is of prime importance. More severe heat treatment or heating for prolonged time may have negative impact on product quality.

Q.6. Write a short note on the Milliard reaction.

Ans: Along with caramelisation, the Maillard Reaction is another most important browning process in foods. The complex pathways of chemical reactions, not only generate important flavour compounds, but they also produce brown colour compounds known as melanoidins. Melanoidins give many foods their characteristic colouring e.g., coffee, bread and meat. **Food types that contain both** protein and carbohydrate **may undergo the Maillard Reaction** e.g., meat, biscuits, bread, coffee and nuts. Cooking methods that may result in the Maillard Reaction are frying, baking, grilling and roasting

Q.6. What are the undesirable compounds formed during the cooking of the food?

Ans: Cooking of foods at higher temperature for prolonged time results in formation of various health hazardous compounds. The generation of potential carcinogenic compounds has received particular attention due to the serious nature of their possible consequences. Perhaps the most well known of these compounds are nitrosamines. During cooking, nitrosamines are produced from nitrites and secondary amines. Several other compounds are considered as carcinogenic, such as acrylamide and heterocyclic amines, which are both formed as a result of the Maillard Reaction, as well as furan, polycyclic aromatic hydrocarbons, and chloropropanols/esters. Most PAHs are not carcinogenic, although a few are (such as pyrene and benzo (a) pyrene). Foods containing starch and protein e.g., meats, biscuits, bread, potatoes mostly generate undesirable compounds during cooking.

Q.7. What is significance of Cramelisation in cooking of foods?

Ans: The color of cooked food has great impact on the edibility of the food. Different physicochemical reactions occurring during the cooking of food are responsible for the generation of typical color. However the main processes responsible for the generation of color in most of the foods is caramelisation. During the caramelisation reaction, molecules known as caramels (Caramelans, Caramelens and Caramelins) are generated and it is these compounds that are responsible for the characteristic brown colour of caramelised foods.

Q.8. Explain mechanism for protein denaturation during cooking?

Ans: Proteins are large molecules, composed of strands of amino acids, which are linked together in specific sequences by the formation of peptide bonds. Generally, the bonds which link the folded amino acid strands together (mostly hydrogen bonds), are much weaker than the strong peptide bonds forming the strands. During cooking, the heat causes the proteins to vibrate violently, which results in the breakage of the

weak hydrogen bonds holding the amino acid strands in place. Ultimately, the protein unravels to re-take its initial form of amino acid strands. The denaturation of protein molecules in foods usually causes a substantial change to the texture of the product. For example, egg white is composed of two key proteins; ovotransferrin and ovalbumin. As the egg white is heated, ovotransferrin begins to denature first, entangling and forming new bonds with the ovalbumin. As the temperature increases, ovalbumin then starts to denature, unravelling and forming new bonds with the ovotransferrin, until denaturation and rearrangement of the protein molecules are complete. In this case, the rearrangement of the protein molecules results in the change of a runny, fluid texture to a rigid, firm texture.

Q.9. How vitamins are affected during cooking?

Ans: Thiamin and Vitamin C are two vitamins, which are most affected by cooking. The losses may occur due to dissolved nutrients being discarded or destruction due to exposure of heat in cooking. Discarding the cooking water accounts for a loss of nearly 20-25 per cent of thiamin depending on the quantity of water used in cooking. The cooking of vegetables for prolonged periods of time can result in a loss of over half of their vitamin C content. If vegetables are heated, canned and reheated, almost 2/3rd of the original vitamin C content may be lost. Vitamin C is the most liable vitamin lost during washing vegetables after cutting, exposing cut vegetables to air for long periods before cooking and/or serving and leaching of vitamin C in the cooking water which is later discarded, amounts to a loss of 10% to 60% depending on the vegetables cooked and the method of cooking used. Loss of riboflavin during cooking occur in four ways (i) exposure of the food during cooking to strong light, (ii) loss of riboflavin due to heat (iii) loss of riboflavin due to leaching by discarding excess of cooking water and (iv) loss of riboflavin due to addition of cooking soda during cooking of dal and vegetables.

Q.10. Why polysaccharide gelatinization during cooking of starchy foods is considered good?

Ans: Foods containing the polysaccharide starch, such as corn flour and rice flour, are often used to create and/or thicken sauces. This is because the cooking of these foods causes a process known as starch gelatinisation. The starch granule is made up of two polysaccharide components, known as amylose and amylopectin. When cooked in water, the starch granules absorb water and swell. At the same time, amylose leaches out of the granules and bonds to form organised lattice structures, which trap the water molecules causing the thickening of the mixture. Any foods containing starch e.g., potatoes, wheat, rice, pasta undergo starch gelatinisation during boiling.