Home Science

Question Paper 2015

Maximum Marks: 70
Time allowed: Three hours

- Candidates are allowed additional 15 minutes for only reading the paper. They must NOT start writing during this time.
- Answer Question 1 from Part I and five questions from Part II,
- The intended marks for questions or parts of questions are given in brackets [ ].

Part-I (20 MARKS)
Answer all questions

Question 1. [10 x 2]
(i) List two advantages of pressure cooking.
(ii) State two ill effects of using baking soda while cooking vegetables.
(iii) What is the effect of germination on the iron content of pulses and cereals?
(iv) State any two safety measures to be adopted to prevent accidents in the kitchen.
(v) List two ways of storing eggs to retain their freshness.
(vi) State two advantages of using blues in laundry.
(vii) List one negative and one positive impact of . advertisements on consumers.
(viii) Enumerate any two factors to be kept in mind while choosing clothes for infants .
(ix) List any two ways of increasing life expectancy.
(x) State two main objectives of meal planning.

Answer:
(i) Two advantages of pressure cooking are as follows:

1. Pressure cooking cooks food faster than any other cooking method and saves energy.
2. Food is cooked at a temperature above the normal boiling point of water which kills most micro-organisms.

(ii) Two ill effects of using baking soda while cooking vegetables are:

1. It destroys vitamin B complex and thiamine content.
2. It results in loss of vitamin C.

(iii) Iron (which is generally found in bond form and not easily available) gets loosened and becomes easily available to the body on germination of cereals and pulses.

(iv) Two safety measures to be adopted to prevent accidents in the kitchen are :

1. Sharp cleaning objects should be kept away from children's reach.
2. Matchboxes and lighters should be kept in locked cabinets.

(v) To retain freshness of eggs :

1. Bring eggs which have been refrigerated and keep them in the refrigerator until used.
2. While storing eggs, keep the broad portion upwards and the narrow end downward, thus, preventing the movement of air cells towards egg yolk.

(vi) Two advantages of using blues in laundry are:

1. Blue being a complementary colour to yellow, diminishes the yellowish tinge of fabrics and makes them appear whiter.
2. It is used as the last rinse to white cellulosic fabric to restore their bright whiteness after bluing.

(vii) Positive impact of advertisements on consumers is that advertisements inform the consumer about the availability, use and special features of a particular product and gives correct information about it. Negative impact of advertisements on consumers is that advertisements persuade the consumers to buy the things which they actually don't want to and sometimes incorrect and insufficient information about the product given by the advertisers misleads the consumer.

(viii) While choosing clothes for infants (0-2 years), factors which should be kept in mind are as follows :

1. Choose soft and smooth fabrics.
2. Choose light-weight fabrics.
3. Choose according to the season.
4. It should be easy to wash and dry.
5. No fasteners, only ribbons/tapes.

(ix) For increasing the life expectancy, one should regularly indulge himself in physical activities such as brisk walking, yoga or exercise, Eat a healthy and a balanced diet, quit smoking and alcohol and stay happy and . optimistic.

(x) The main objective of meal planning is to create a 'Balanced Diet' for a family so that it can get as much nutrients as possible. The meal is planned to provide the necessary nutrients is within the budget

Part-II (50 Marks)
Answer any five questions.

Question 2.
Suitable cooking methods based on scientific principles are being used to get maximum food value. In this context, explain :
(a) The changes in the texture of food while cooking. [5]
(b) Two recent developments in cooking and their advantages. [5]

Answer:
(a) Cooking brings about chemical changes in food. The texture and taste changes when the food is cooked. Boiling makes food soft, tasty and easy to digest while stewing is a slow method which makes it tender. Steaming makes the food light and easy to digest while frying hardens the outer surface of the food thereby preventing loss of flavor and juices. For example :

Meat and eggs are good sources of protein. The protein molecules change shape as a result of the heat energy they absorb. This is called denaturing and it is permanent. Denaturing causes changes in the appearance and texture of the meat and eggs when they are cooked, therefore when cooked, proteins shrink, lose moisture and become firm.

Potatoes are a good source of carbohydrate. Raw potato is hard and has an unpleasant taste but it becomes softer and easier to digest when cooked.

The texture of fats can range from firm to liquid. For example, oils are just fats that stay liquid at room temperature. Fats melt when heated, soften or liquefied

When sugar is exposed to heat, it melts, but as the temperature continues to rise, the sugary syrup gradually turns yellow and then brown, imparting a rich, delicious flavor. The process is known as caramelisation

Every food has some amount of water in it. As any food is heated, the water begins to evaporate, resulting in the food drying, as it is cooked.

(b) Two recent developments in cooking are explained as follows;
Microwave Cooking : Today almost every home has a microwave oven that is used

frequently to thaw, reheat, and cook food. It is efficient, cost effective and convenient. Using microwave oven is of recent origin. Here, food is heated and cooked by electromagnetic waves. It can be used for cooking rice, vegetables, flesh etc. But food like cakes and pastries do not bake easily in microwave ovens.
Advantages:

1. Microwave oven cooks a variety of food in about l/4th of the time required on a gas burner. Thus, it saves energy and fuel.
2. It saves time in heating frozen foods. Thawing can be done in minutes or seconds.
3. The oven or the utensil does not get heated along with the food inside it except, under prolonged heating periods.
4. Flavor and texture do not change when reheated in a microwave oven.
5. Loss of nutrients is minimized. ((3-carotene and vitamin C are better retained by microwave cooking as compared to pressure cooking and saucepan cooking.)
6. After cooking in a microwave oven, washing dishes is much easier as food does not stick to the sides of the vessels.
7. Food gets cooked uniformly.
8. It preserves the natural color of vegetables and fruits.
9. No fat or low-fat cooking can be done easily.

Solar Cooking : Solar cooking is a form of outdoor cooking and is often used in . situations where the danger of accidental fires is high or minimal fuel consumption is important. At a basic level, solar cooking relies on the principle of concentrating sunlight, converting light to heat and then trapping it. Food is prepared in the same way as in an oven or a stove top. However, food placed inside a solar cooker is usually cut into smaller pieces, because food cooks faster when it is in smaller pieces, For very simple cooking, a lid may not be needed and the food may be placed on an uncovered tray or in a bowl. If several foods are to be cooked simultaneously, then they are placed in different containers.

Food that cooks quickly can be added to the solar cooker later. Depending on the size of the solar cooker and the quantity of cooked food, a family may use one or more solar cookers. A solar oven is turned towards the sun and left until the food is cooked. Unlike cooking on a stove or over a fire, which may require more than an hour of constant supervision, food in a solar oven is generally not stirred or turned over, both because it is unnecessary and because opening the solar oven allows the trapped heat to escape and thereby slows the cooking process. The cooking time depends primarily on the equipment being used, the amount of sunlight at the time and the quantity of food that needs to be cooked. Air temperature, wind, and latitude also affect the performance of a solar cooker.
Advantages :

1. High-performance parabolic solar cookers can be used to grill meats, stir-fry vegetables, make soup, bake bread, and boil water in minutes.
2. Conventional solar box cookers can sterilise water or prepare most foods that can be made in a conventional oven or stove, including bread, vegetables and meat over a period of hours.
3. Solar cookers use no fuel. This saves cost as well as reduce environmental damage caused by fuel use.
4. Solar cookers have large economic and environmental benefits by reducing deforestation.
5. Any type of cooking may evaporate grease, oil and other material into the air, hence requiring less cleaning.

Question 3.
Food preservation prevents wastage of food. In this context, explain :
(a) The principles of food preservation. [5]
(b) Dehydration and use of chemicals to preserve food. [5]

Answer:
(a) Any food item can be kept for certain period of time under normal conditions of temperature and humidity. Food items are fresh, cheap and available in abundance during the seasons. If these are not properly preserved for off seasons consumption, they will get spoiled. Thus, preservation of food items prevents the wastage.

The principles of food preservation are described below:
Use of Low Temperature : It involves storing the food items at a temperature below normal room temperature. The action of micro¬organisms and chemical activity slows down at lower temperatures and as such, the putrefaction or process of decay is delayed and food items can be preserved for periods more than the normal.

Home refrigeration : If can be done by using refrigerator, ice box etc. The perishable food items like fruits, vegetables, fish, meat, egg, milk , curd and leftover food can be preserved for some additional period.

Freezing : The growth of micro-organisms' enzymatic activity and chemical reactions are extremely slow at a temperature below ice point and the food items can be preserved for weeks together.

Use of High Temperature: Pasteurisation and Canning are examples that utilise high temperature methods for preservation of food. Heating at high temperature destroys all microorganisms and enzymes.

Pasteurization : This generally refers to preserve milk either by holding process or flash process. In holding process, the milk is heated to 65° C and kept at this temperature for 30 minutes and then cooled down. In flash process, the milk is heated to 75° C, only for 15 seconds. This process is also called high temperature for short time (HTST). The milk is cooled and packed in bottles and kept in deep freezer till distribution.

Canning : Vegetables, fruits and meat are preserved by this method. The items are prepared, packed in tins, sealed and then heated to high temperature to destroy the micro-organisms. This process is termed as 'Sterilisation'. The seal of the tin prevents any contamination of food and thus food is preserved for a long period of time.

Drying : Drying of food items by evaporating the moisture from it prevents the growth of micro-organisms and hence, prevents food from getting spoiled. Drying in sun is very cheap and effective. The vegetables are cleaned, washed, cut and dipped in boiling water for 10 minutes and then sundried.

Use of preservatives : Certain chemicals also prevent the growth of micro-organisms. Pickles, jams, murabbas are preserved by using chemicals like salt, vinegar, sugar, spices etc. Sodium benzoate or potassium meta- bisulphite are used as preservatives for squashes, ketchup etc.

Use of radiation : The ultra violet or gamma rays are allowed to pass through packaged food to sterilize it. This is rather a recent technique and not much in use.

(b) Dehydration is a modern development of smoking and drying, the process is quickened by using a heated oven with a pressure lower than the atmospheric pressure, which prevents the food from spoiling. It is a method of food preservation in which food is dried (dehydrated or desiccated). Drying inhibits the growth of bacteria, yeast and mould through the removal of water. Different kinds of food can be prepared by dehydration. Fruits change characteristics when dried completely.

Plum becomes a prune, the grape a raisin when dries. Figs and dates are also transformed into new, different products that can either be eaten as they are or rehydrated. Home drying of vegetables, fruit and meat can be carried out with electrical dehydrators (household appliance) or by sun-drying. Industrial food dehydration is often accomplished by freeze drying. In this case, food is flash frozen and put into a reduced-pressure system which causes the water to sublimate directly from the solid to the gaseous phase. Although freeze¬drying is more expensive than traditional dehydration techniques, it also mitigates the change in flavour, texture and nutritional value.

Chemical food preservatives are applied to foods as direct additives during processing or they themselves develop it during processes such as fermentation. Certain

preservatives have been used for centuries and include sodium chloride (common salt), sugar, acids, alcohols and components of smoke. In addition to preservation, these compounds contribute to the quality and identity of the product and are applied through processing procedures such as salting, curing, fermentation and smoking. Two of the chemicals allowed for preservation are sulphur dioxide and benzoic acid. Both of these substances prevent bacterial activity.

The amount of preservative that can be added to the foodstuff is strictly controlled by law. For domestic use, potassium meta-bisulphate and sodium benzoate are favoured chemicals. These chemicals prevent the growth of micro¬organisms. Pickles, jams, murabbas are preserved by using chemicals like salt, vinegar, sugar, spices etc. Sodium benzoate or potassium meta-bisulphite are used as preservatives for squashes, ketchup etc.

Question 4.
(a) How can a meal be made economical through planning ? [5]
(b) Discuss the impact of skipping meals on the health of an individual. [5]

Answer:
(a) The money available decides what is purchased for the family. When the budget available per day is low, it is necessary to have a good knowledge of less-expensive food, which has high nutritive value.

Few points by which a meal is made economical are :

- Plan the meal for several days or at least for a week.
- Make an accurate shopping list, including quantity and quality of goods you need, also check supplies in stock.
- Purchase from market after comparing prices.
- Seasonal food can be preferred as it is cheaper and has immediate nutritional value.
- Choose food from each food group which has low cost but same nutritive value.
- Avoid wastage of food, whether it is raw or cooked. It adversely affects the economy.
- Avoid ‘impulsive buying’ as it is hazardous for your budget.
- Meals cooked at home are cheaper, healthier and better than that brought from the market.
- If possible, grow fruits and vegetables in your own garden.
- Menu adjustment saves time, money and energy.

(b) Impact of skipping meals on the health of an individual:

- Skipping meals makes the individual dull, both mentally and physically.
- It reduces the overall working ability and stamina of the individual.
- Due to the essential need of energy in the human body, skipping meals can also cause diabetes and many such health-related issues.
- Diseases such as anaemia, weakening of bones, low immunity and deteriorating dental health are all results of skipping meals.
- Having just a meal a day results in burning fewer calories than required in the human body per day which may cause internal malfunctioning of the body.

Question 5.
(a) Any five factors that lead to stress in adolescents. [5]
(b) What is the influence of the family during the stage of adolescence ? [5]

Answer:
(a) Adolescence is a short period of dramatic physical, mental and emotional development. For few, the switching to adulthood is an easy transition, while for most, it is a period of stress.

Various factors that lead to stress in adolescents are:
Physical changes : They undergo many important physical changes in their bodies. The rapid growth in the body can lead to nutritional deficiencies if balanced diet is not taken. Teens must accept the changes as they develop mentally, physically and emotionally.

Social pressure : Social pressure is another common cause of stress for adolescents. Most of the teens try to fit in the friends group around them and under peer pressure they struggle a lot to socialize with their friends and classmates in order to win their approval. They might also fall under the trap of peer pressure or social pressure and end up indulging in activities such as drinking alcohol, smoking, consuming drugs, etc., just to be accepted in the society.

Academic burden : School and academic concern are the biggest cause of creating stress for.most of the adolescents. The academic work pressure such as completion of homework, scoring well in examinations, participating in co-curricular activities and sports are the greatest causes of stress for teens. They might also feel stressed due to parental expectation of high scores.

Family environment : Family issues such as unhealthy environment within the family, domestic violence, parents separating or divorcing, death or illness in the family can cause more stress in the teen’s life. Lack of understanding between siblings or parents contributes to increased stress levels.

Peer Pressure : Adolescents may have a big group of friends still they undertake a lot of stress which causes a negative effect on them. Popularity is important for them and a lack of it can create feelings of loneliness and depression.

(b) With the stage of adolescence, the need for recognition crops up among youngsters. In the family circle, they want to be recognized and heard in important family decisions.

In families where adolescents are treated like friends, there are less chances of them choosing wrong paths. Positive and supportive family environment creates transparency in relations. Restrictive family environment results in less transparency among family members, leading to adolescents making wrong choices like smoking and drinking.

Question 6.
(a) Explain any five salient features of the Food Adulteration Act. [5]
(b) List two foods that are generally adulterated with metanil yellow. State its ill effects. [5]

Answer 6.
(a) Food Adulteration Act, 1954 is an act formulated by the government aiming at the avoidance of adulteration of food which may affect unhealthy living conditions. The act also intends to penalise the dealers who are engaged in production anr sale of contaminated food substance.

Salient features of Food Adulteration Act are :

- If the article sold by vendor is not of the nature, substance or quality demanded by the purchaser.
- If the article contains any other substance which affects the substance or quality there of.
- If any inferior or cheaper substance has been substituted wholly or in part for the article so as to affect the nature, substance or quality of the product.
- If any constituent of the article has been wholly or in part, extracted to affect the quality there of.
- If the article consists wholly or in part any filthy, putrefied, rotten decomposed or diseased animal or vegetable substance or is insect-infested or is otherwise unfit for human consumption.

(b) Foods that are generally adulterated with metanil yellow are arhar dal, moong washed chana, ice candy, faluda etc. Ill effects :
Metanil yellow is highly carcinogenic in effect. Intake of this colour produces various abnormalities of bones, eyes, skin, lungs, ovaries, testicles, mental retardation, anaemia

and accumulation of lead in the body and blood. Food colorings have also been linked to an increase in hyperactive behaviour

Question 7.
(a) Suggest two ways to prevent falls at home. [5]
(b) How can electrical equipment be used safely at home ? [5]

Answer 7.
(a) For safety purpose, check whether rooms and hallways have no obstacles for safer movements. Busy areas should be cleared of things such as newspapers, electrical goods, boxes, phone cords, furniture and plants. All the household items such as bed covers and clothing material should be stored at a place where one can reach comfortably.

Two ways to prevent falls at home are :

Bathroom Safety :

- While moving in bathroom area, in and out of the tub or shower, be sure to be safe by drying the area.
- Don't forget to remove the build up of soap in tub or shower.
- It is necessary to place non-slip strips/treads in the bathing area.
- Adjustable shower heads should be installed.

Kitchen Safety :

- Items such as dishes, food items and others which are used frequently should be kept in easy-to-reach locations.
- While using a step stool, make sure it has a bar at the top to hold on to.

Question 8.
(a) Explain each step involved in the laundering of woollen garment. [5]
(b) What are the different methods of laundering ? Explain them in brief. [5]

Answer:
(a) Steps involved in the laundering of woollen garment are as follows : .
Preparation : Examine the garments for tears, holes, stains or foreign particles and then treat them accordingly. For knitted woollens, tracing their outline on elasticity is important which further increases when it is wet. So, the knitted woollen fabrics invariably lose their shape. The tracing helps to restore the cloth to original shape.

Steeping : Steeping of woollen garment is ‘ generally avoided because wool is a weak and elastic fabric. If required, they should not be soaked for more than 5-10 minutes in cold water. Do not use hot/Lukewarm water as it can cause dyes to run and damage the wool fibres.

Washing : Wool is a protein fibre and is highly sensitive to alkalis. Washing it with even mild soaps may harm it. Only neutral soap or reetha should be used for washing woollens.

Rinsing : Extra soap is gently squeezed out from the woollen fabric by pressing it between flat palms and then rinsing off several times in water.

Drying : Because of its low strength, it cannot be wrung tightly to remove excess water. It is therefore rolled tightly in a towel and squeezed so that extra water is absorbed by the towel without straining the wool fibre. Then it is spread flat within the outline marked for its original shape and is allowed to dry in shade.

Pressing : Knitted woollens being highly elastic, tend to lose their shape on ironing therefore they are not ironed but simply pressed. A moist, thin muslin cloth is spread over woollen cloth and then it is pressed with hot iron.

(b) Generally there are two broad categories of laundering. These are wet method and dry method.

Wet Method:

There are four method, of wet washing which are given as follows :

By friction : Cotton cloth, curtain line etc. . are washed by rubbing with hands or brush or on scrubbing board. Small clothes are rubbed with hands whereas excessively dirty clothes are cleaned by rubbing with a brush or on a scrubbing board.

By light pressure : Silken and woollen clothes should be washed by light pressure. Clothes with delicate laces are washed with light hands after applying soap. In this way, clothes are cleaned without being damaged.

By application of suction : This is done by suction washer. It is available in two sizes— small and big. It is made up of non¬. rusting metal. In this method, the clothes are dipped into a tub containing soap solution. The suction machine is moved on it and the dirt is removed.

By Washing machine : These machines are commonly used these days. These are of three types of washing machine. Manual washing machine, Semi-automatic machine and fully automatic machines.

Dry Method : Dry cleaning is any cleaning process for clothing and textiles using a chemical solvent other than water. It is used to clean delicate fabrics that cannot withstand the rough and tumble wash of a washing machine and cloth dryer. It can also eliminate labor-intensive hand washing. The process of dry cleaning is based on the fact that the dirt sticks to the clothes by grease. When grease is removed, the dirt too gets removed by itself.

Dry cleaning agents :
Absorbents : These are dry powders which absorbs the grease from the fabric. Some of the substances used as dry cleaning powders are fuller's earth, chalk powder, talcum powder, bran, salt, bread crumbs, french chalk and powdered sulphur.

Solvents : There are certain liquids like petrol, benzene, kerosene, carbon tetrachloride, ether etc. which dissolve grease from the fabric and release the dirt from it.

Question 9.
Write short notes on any two of the following :
(a) Inclusion of seasonal fruits and vegetables in the diet. [5]
(b) Standardisation marks and their significance. [5]
(c) Modification in the diet for the elderly. [5]

Answer 9.
(a) Inclusion of seasonal fruits and vegetables in the diet increases the immunity power and gives the following benefits :
It is healthier : When product is grown in its proper season, under the appropriate growing conditions, it exhibits all of its natural nutrients. Seasonal fruits and vegetables don't have to endure as much travel, so they don't lose those vital nutrients.

Cost effective : Effective Food is easier to grow in its proper season, making it more abundant, less time-intensive, and more affordable for consumers.

Greater variety of ingredients : If fruits and vegetables are seasonal you'll find huge variety of them.

Environment friendly : Seasonal eating greatly reduces the need for practices like carbon footprint. A reduced carbon footprint is good for the environment, has health benefits, and reduces cost which are all great reasons to eat seasonally. The flavours are stronger and more developed.

(b) Standardisation marks are marks given to a product which meets certain standards with respect to the quality of the product in terms of material used, method of manufacturing, labelling, packaging, sales and performance.

Wool mark : It was established in 1949. It promotes pure wool, products. It makes it necessary for manufacturer to mention the amount and identity of other fibres used along with pure wool on the label of wool and woollen garments.

ECO Mark : It has been launched recently by the BIS. It is given to those products which not only meet ISI standards but also saves energy i.e. they are environment-friendly and reduce environmental pollution. Examples: Edible oil, tea/coffee etc.

FPO : All manufactures of fruits and vegetable products acquire a license of their production and sale, after meeting the FPO standards. Example: Pickle, jam, ketchup, canned fruits etc.

ISI Mark : Used for industrial products, the mark certifies the product as up to Indian standard, given by the national standard body of India, Bureau of Indian Standards (BIS).

AGMARK : It is given to the agricultural, horticultural, forest and livestock products. Example: Wheat flour, rice, pulses, ghee, honey, egg etc.

(c) While planning a diet for elderly, the following points should be kept in mind :

- Provide about 1 litre of milk in the form of milk, curd, buttermilk etc.
- An egg a day is good for them.
- One citrus fruit like orange grapes it.
- Cereals, thrice a day in the form of chapati, dalia, rice etc.
- Seasonal foods should be included.
- Serve vegetables thrice a day including green leafy vegetables.
- For non-vegetarians, serve meat, fish etc., once or twice a week. For vegetarians serve pulses and nuts.
- The food should be well-cooked and fresh.
- Use less fat and spices.
- Serve small meals at frequent intervals.
- Serve palatable and interesting meals.
- Do not overlook the psychological needs of the aged. Provide an atmosphere of love and security.