



# ST. ANNE'S COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE New Delhi, Affiliated to Anna University, Chennai)

Accredited by NAAC

ANGUCHETTYPALAYAM, PANRUTI – 607106

## QUESTION BANK

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SUB CODE/NAME: OBT 351 – FOOD, NUTRITION AND HEALTH

PERIOD: JAN 2024 - MAY 2024

BATCH: 2021– 2025

YEAR/SEM: III/VI

### UNIT-I FOOD AND MICROBIOLOGY OF HEALTH:

#### 1. What is health microbiology?

Microbiology in Clinical Pathology

Medical microbiology involves the identification of microorganisms for the diagnosis of infectious diseases and the assessment of likely response to specific therapeutic interventions. Major categories of organisms include bacteria, mycobacteria, fungi.

#### 2. What is the main food source for plants?

Plants use a process called photosynthesis to make food. During photosynthesis, plants trap light energy with their leaves. Plants use the energy of the sun to change water and carbon dioxide into a sugar called glucose. Glucose is used by plants for energy and to make other substances like cellulose and starch.

#### 3. What are the food of plants?

Plants take in water through their roots. They take in minerals from the soil through their roots as well. These minerals are sometimes called fertilizers or plant food. Plants also take in carbon dioxide from the air through tiny holes in their leaves.

#### 4. What are the five food groups?

Fruit and vegetables.

Starchy food.

Dairy.

Protein.

Fat

### **5.What are food resources and its types?**

Main food resources are: Crops: Mainly crops providing grains like rice, wheat, maize, etc. Vegetables and fruits: It includes vegetables and different types of fruits. Animals and Birds: Animals like cow, goat, pig, camel and hen are utilised for food production.

### **6.What are some examples of animal food materials?**

The food we get from animals: Meat, Eggs, Milk and Milk products (like Cheese, Ghee, Butter, Curd, Sweets, etc.), Honey.

### **7.What are 3 animal sources of food?**

Animal-source foods (ASF) – including fish, meat, eggs, and dairy – can be an important component of nutritious diets. ASF are typically energy and nutrient dense, packing large amounts of multiple nutrients into small volumes

### **8.What is the function of food resources?**

Keep our bodies warm and give us energy; Keep our bodies healthy by helping our immune systems to prevent or fight disease; Repair or healing of injuries. Helps our brains to grow and function properly.

### **9.What is the main food source for animals?**

It includes hay, straw, silage, compressed and pelleted feeds, oils and mixed rations, and sprouted grains and legumes. Grass and crop residues are the most important source of animal feed globally.

### **10.What are the food production systems?**

A food system is all processes and infrastructure involved in satisfying a population's food security, that is, the gathering/catching, growing, harvesting (production aspects), storing, processing, packaging, transporting, marketing, and consuming of food, and disposing of food waste (non-production aspects).

### **11.What are functional foods and superfoods?**

Berries, spinach, almonds, barley, sardines, etc., are some of the common examples of functional foods. Most plant based foods and also some fish and dairy foods which are nutritionally dense and are good for a person's health are termed as superfoods.

### **12.How does food affect behavior?**

Eating regular meals helps to regulate blood sugar. This may influence some of the hormones that control our mood and ability to concentrate. For this reason, poor mood and

behaviour are often observed in children who have been without food for too long (for example, children who haven't eaten breakfast).

### **13. What is food Behavior's?**

Eating behavior is a complex interplay of physiologic, psychological, social and genetic factors that influence meal timing, quantity of food intake, food preference, and food selection.

### **14. What is food inspection process?**

Food inspection is the process of examining and evaluating food products to ensure that they meet certain standards and requirements for quality and safety. The inspection can take place at various stages of the food production chain, from the initial raw material to the final product that reaches consumers.

### **15. What is food quality inspection?**

Independent food inspection is an examination of food in production as a form of quality control. Through this process, the standards of the product are assessed at multiple points in the production cycle to ensure conformity at every step.

### **16. What are the indicators of food product quality?**

Some examples of physical indicators are color, moisture, density, viscosity, hardness, and crispness. For instance, you can use a colorimeter to measure the hue, saturation, and brightness of food samples, or a penetrometer to measure the firmness of fruits and vegetables.

### **17. What is a microbial analysis of food quality?**

Microbiological analysis of food products is the use of biological, biochemical, molecular or chemical methods for the detection, identification or enumeration of microorganisms in a material (e.g. food, drink, environmental or clinical sample). It is often applied to disease causing and spoilage microorganisms

### **18. What is microbial quality control?**

Quality control allows microbiologists to monitor and protect against microbial impurities in biomanufacturing production systems. Protocols must be adhered to in order to control the environmental factors in production and maintain a sterile environment throughout the process.

### **19. What are the measures of food safety?**

Clean: Wash your hands and surfaces often.

Wash your hands for at least 20 seconds with soap and warm or cold water before, during, and after

preparing food and before eating. Always wash hands after handling uncooked meat, chicken and other poultry, seafood, flour, or eggs.

### **20. What is microbiological safety?**

Microbiological safety is incredibly important to ensure that diseases and harmful organisms are contained in a secure way. The law recognizes this, and there is significant legislation that dictates how microbiological agents should be studied, transported, and controlled.

### **21. What is control strategy?**

Control strategy means a strategy to ensure robust and safe operation of the function(s) of "The System" in response to a specific set of ambient and/or operating conditions (such as road surface condition, traffic intensity and other road users, adverse weather conditions, etc).

### **22. What is the purpose of HACCP?**

HACCP is a food safety system designed to identify and control hazards \* that may occur in the food production process. The HACCP approach focuses on preventing potential problems that are critical to food safety known as 'critical control points' (CCP) through monitoring and controlling each step of the process.

### **23. What is a microbiological criterion in the food industry?**

Microbiological criteria give guidance on the acceptability of foodstuffs and their manufacturing processes. Preventative actions, such as the application of Good Hygiene and Manufacturing Practices (GHP, GMP) and the Hazard Analysis Critical Control Point (HACCP) principles contribute to achieving food safety.

## **PART-B**

**[First Half]**

- 1. Explain various food resources from plants.**
- 2. Explain various food resources from animals.**
- 3. Explain various food resources from microbes.**
- 4. write briefly about Overview of current production systems.**
- 5. With example explain Functional and "Super" Foods.**
- 6. Explain Types and Safety Concerns of Fat Substitutes.**
- 7. Explain Health Benefits and Safety Concerns of Fat Substitutes.**
- 8. Explain the Food and behaviour briefly with examples?**

- 9. Explain the physiological disturbances in alcoholism, drug abuse and smoking.**
- 10. Explain various Food Related Laws?**
- 11. Explain the microbial indicators of product quality.**
- 12. Explain the various indicator of food safety?**
- 13. Write about the control strategies in food safety?**
- 14. Write short notes on Microbiological criteria ?**
- 15. Explain about Hazard Analysis Critical Point System (HACCP concept).**

## UNIT-II NUTRIENTS AND FOOD ADDITIVES

### **1. Which are micronutrients?**

Micronutrients are the elements required by us in small quantities. Iron, cobalt, chromium, iodine, copper, zinc, molybdenum are some of the micronutrients. Deficiency of any of the nutrients affects growth and development.

### **2. What are macronutrients?**

Carbohydrates, fat and protein are called macronutrients. They are the nutrients you use in the largest amounts. “Macronutrients are the nutritive components of food that the body needs for energy and to maintain the body's structure and systems,” says MD Anderson Wellness Dietitian Lindsey Wohlford.

### **3. What is the role of nutrients in physiology?**

Nutrients have one or more of three basic functions: they provide energy, contribute to body structure, and/or regulate chemical processes in the body. These basic functions allow us to detect and respond to environmental surroundings, move, excrete wastes, respire (breathe), grow, and reproduce

### **4. What is the role of digestion in nutrients physiology?**

Digestion is a process that converts nutrients in ingested food into forms that can be absorbed by the gastrointestinal tract. Proper digestion requires both mechanical and chemical digestion and occurs in the oral cavity, stomach, and small intestine.

### **5. What is the source and function of carbohydrates?**

The most common and abundant forms are sugars, fibers, and starches. Foods high in carbohydrates are an important part of a healthy diet. Carbohydrates provide the body with glucose, which is converted to energy used to support bodily functions and physical activity.

### **6. Why is protein the most important macronutrient?**

Protein is undeniably the most important macronutrient when it comes to fueling your body right. Its role in building and repairing tissues, supporting muscle growth, and enhancing satiety makes it a game-changer for optimizing your nutrition and overall health.

## **7. What are the functions of macro and micronutrients?**

### **Functions of Macronutrients and Micronutrients**

- Metabolism as it is an important substance and part of amino acids, proteins, and enzymes.
- Influences germination and vegetative growth.
- Being a component of chlorophyll, it plays an important role in photosynthesis.
- Responsible for the rapid growth of foliage.

## **8. What are types of protein?**

Any protein in the human body can be created from permutations of only 20 amino acids. There are seven types of proteins: antibodies, contractile proteins, enzymes, hormonal proteins, structural proteins, storage proteins, and transport proteins.

## **9. What is the role of lipids in food?**

Lipids, in addition to providing energy, texture, and mouthfeel, play an important role in the odor and flavor development of food. This could be due to the ability of lipids to generate odors and flavors, act as precursors of odor and flavor compounds, or modify the odor and flavor of other components.

## **10. What are 5 examples of lipids?**

There are different types of lipids. Some examples of lipids include butter, ghee, vegetable oil, cheese, cholesterol and other steroids, waxes, phospholipids, and fat-soluble vitamins. All these compounds have similar features, i.e. insoluble in water and soluble in organic solvents, etc.

## **11. What is called lipid?**

A lipid is any of various organic compounds that are insoluble in water. They include fats, waxes, oils, hormones, and certain components of membranes and function as energy-storage molecules and chemical messengers.

## **12. What are the 7 essential micronutrients?**

There are 7 essential plant nutrient elements defined as micronutrients [boron (B), zinc (Zn), manganese (Mn), iron (Fe), copper (Cu), molybdenum (Mo), chlorine (Cl)]

## **13. Why are minerals micronutrients?**

Your body needs smaller amounts of micronutrients relative to macronutrients. That's why they're labeled "micro." Humans must obtain micronutrients from food since your body cannot produce vitamins and minerals — for the most part. That's why they're also referred to as essential nutrients

#### **14. Why are they called micro minerals?**

Microminerals are so named because there are needed in much smaller or 'trace' amounts and weighed in milligrams ( 1/1,000 gram) and micrograms (1/1,000,000 gram).

#### **15. What are the functions of micro minerals?**

Micronutrients are involved in virtually all metabolic and cellular functions, like energy metabolism, primary and secondary metabolism, cell protection, gene regulation, hormone perception, signal transduction, and reproduction among others.

#### **16. What is the role of calcium in micronutrients?**

Your body needs calcium for muscles to move and for nerves to carry messages between your brain and every part of your body. Calcium also helps blood vessels move blood throughout your body and helps release hormones that affect many functions in your body. Vitamin D helps your body absorb calcium.

#### **17. What is the role of Magnesium in micronutrients?**

It helps to maintain normal nerve and muscle function, supports a healthy immune system, keeps the heartbeat steady, and helps bones remain strong.

#### **18. What is the role of Iron in micronutrients?**

Iron is a mineral that the body needs for growth and development. Your body uses iron to make hemoglobin, a protein in red blood cells that carries oxygen from the lungs to all parts of the body, and myoglobin, a protein that provides oxygen to muscles. Your body also needs iron to make some hormones.

#### **19. What is the role of zinc in micronutrients?**

Zinc is an essential micronutrient for human metabolism that catalyzes more than 100 enzymes, facilitates protein folding, and helps regulate gene expression.

#### **20. What is the role of copper in micronutrients?**

Copper (Cu) is an essential micronutrient for humans, animals, and plants, and it participates in various morphological, physiological, and biochemical processes. Cu is a cofactor for a variety of enzymes, and it plays an important role in photosynthesis, respiration, the antioxidant system, and signal transduction.

#### **21. What is the role of Selenium in micronutrients?**

It is found naturally in foods or as a supplement. Selenium is an essential component of various enzymes and proteins, called selenoproteins, that help to make DNA and protect against cell damage and infections; these proteins are also involved in reproduction and the metabolism of thyroid hormones.



## 22. What is the role of vitamin in micronutrients?

Micronutrients are one of the major groups of nutrients your body needs. They include vitamins and minerals. Vitamins are necessary for energy production, immune function, blood clotting and other functions.

## 23. What is major nutrients and minor nutrients?

Difference between Micronutrients and Macro-nutrients

### Micro-nutrients

Vitamins, minerals and trace elements.

Antioxidants, Minerals, and Vitamins are examples of macro-nutrients.

### Macronutrients

Carbohydrate, protein and fats.

Proteins, fibre, carbohydrates, and fats are examples of micro-nutrients.

### Examples

### Sources.

## 24. What is the use of biotechnology in the production of food additives?

Biotechnology in the food processing sector makes use of micro-organisms for the preservation of food and for the production of a range of value-added products such as enzymes, flavour compounds, vitamins, microbial cultures and food ingredients.

## 25. What is the function of colors in food additives?

Color additives are used in foods for many reasons including: To make food more attractive, appealing, appetizing, and informative. Offsetting color loss over time due to exposure to light, air, temperature extremes, moisture and storage conditions.

## 26. Define micro polysaccharides.

Microbial polysaccharides are high molecular weight carbohydrates produced by microorganisms such as bacteria, fungi, yeast, and algae. These polysaccharides include carbohydrates that are produced and accumulated inside the cells such as glycogen where they function as energy and carbon reserves.

## 27. what is microbial enzymes?

Microbial enzymes are particularly useful to the food industry due to the ease and scalability of production using renewable resources, low environmental impact and their

reduced cost and the use of both native and recombinant enzymes in food applications is increasing.

**PART-B**  
**[First Half]**

- 1.Explain the various Macro nutrients, carbohydrates, proteins and lipids with example?**
- 2.Explain the various Micronutrients Minerals, Calcium, Magnesium, Iron, Zinc, Copper and Selenium; Vitamins.**
- 3.Explain various Nutritional Physiology, Digestion, absorption, and utilization of major and minor nutrients.**
- 4.Explain Biotechnology of food additives and Bio flavors and colors.**
- 5.Explain microbial polysaccharides briefly?**
- 6.Write the recombinant enzymes in food sector with examples?**

## **UNIT-III NANO FOOD TECHNOLOGY**

### **1. What are the nano material used as food component?**

Metal and metal oxide nanomaterials can be used in food packaging to enable antibacterial and antifungal properties of the packaging material. Ag, Cu metals, zinc, copper, iron, and titanium oxides have typically been the main nanoparticles used for this purpose.

### **2. What are the nano material used for food packaging?**

The different inorganic nanoparticles such as titanium oxide, zinc oxide, copper oxide, silver, and gold are the most preferred inorganic nanoparticles used in food packaging. Food systems can benefit from using these packaging materials and improve physicochemical and functional properties.

### **3. How are nanomaterials used in the food industry?**

With regard to food safety, nanotechnology is utilized to detect pathogens and toxins in food products and to strengthen barrier properties.

### **4. What are three ways nanotechnology is being used in food and food packaging?**

Nanomaterials used for food packaging provide many benefits such as improved mechanical barriers, detection of microbial contamination and potentially enhanced bioavailability of nutrients.

### **5. What are examples of nano foods?**

Nano-sized particles occur naturally in some foods: a good example is milk. Casein micelles in milk are nano-sized spheres made of proteins. By naturally coming together this way, the nutrients in the micelles are more available for us to absorb.

### **6. Why are nanomaterials used in food?**

Nanotechnology applications in food sciences. Many foods use nanoparticles to enhance flow characteristics, flavour, stability, and colour during processing and extend shelf life of food.

### **7. What is nano used for?**

Nanotechnology has already been embraced by industrial sectors, such as the information and communications sectors, but is also used in food technology, energy technology, as well as in some medical products and medicines.

## **8.What Is Food Product Development?**

Product development is the complex process needed to introduce a new or improved product to the market. In the food industry, this involves developing food products that interest the target market and address gaps in their current preferences and needs.

## **9.What is the aim of food product development?**

The process spans several steps, from research through formulation and testing and on to commercialization. Ultimately, the goal is to create products that meet consumers' needs, tastes and preferences, while also being safe, nutritious and profitable for the company.

## **10.What is in food products?**

Food is mainly composed of water, lipids, proteins, and carbohydrates. Minerals (e.g., salts) and organic substances (e.g., vitamins) can also be found in food. Plants, algae, and some microorganisms use photosynthesis to make some of their own nutrients.

## **11. What are the 10 stages of product development?**

### **10 steps in the product development process:**

- Customer Problem. It all starts with a single problem. ...
- Product Conception. A new product needs to be novel and add additional value to what's already on the market. ...
- Research. ...
- Design and Development. ...
- Prototyping. ...
- Testing. ...
- Certification. ...
- Field Trial.

## **12.What is the overview of food product development?**

Food product development is a process that involves a load of crucial steps ideation, ingredient selection, taste testing, packaging design, regulatory compliance, marketing strategy and distribution.

## **13.What is the role of a food product developer?**

The task involves doing innovation in current product offerings and customer services to enhance the brand image and gain competitive edge in the market. The job will typically include lab scale trials and make sure that the specifications are documented for each new product.

#### **14. What is the role of product development?**

Product development is the process of creating or improving a new product or service, including its design, testing, and release. The product lifecycle may also include controlling cost, quality, and time to market by improving manufacturing or distribution processes.

#### **15. What is product development responsibility?**

Product developers handle designing and creating new products, as well as maintaining or updating existing ones. They may work alone or in teams, depending on their role within the company.

#### **16. What is a product development strategy?**

A product development strategy sets the direction and/or focus for new products or the steps to revise existing ones. This includes objectives and goals, funding, marketing and market penetration tactics.

#### **17. What is an example of product development?**

Product development strategy examples

Product development can often be as simple as taking an existing product, modifying it slightly and selling it into your existing market.

#### **18. What are the steps in food product development?**

Food product development is a process that involves a load of crucial steps ideation, ingredient selection, taste testing, packaging design, regulatory compliance, marketing strategy and distribution.

#### **19. What is food product development?**

Food product development is a series of stages that a business goes through, whether a home-based company or corporate business, to bring a new food product or innovation to the consumer market.

#### **20. What is an example of nanotechnology in food security?**

For example, gold-based nanoparticles are used for the detection of aflatoxin B1 that is often found in milk. In agriculture, nano sensors are used to indicate pesticides present on the surface of vegetables and fruits.

**PART-B**  
**[First Half]**

1. Explain Nano materials as food components,
2. Explain nano material as food packaging.
3. Write about the policies on usage of nano materials in foods.
4. Explain the Food product development and steps involved in food product development.
5. Explain the Food product development and the shelf-life assessment.

## **UNIT-IV FOOD RELATED NUTRITIONAL DISORDERS AND ENERGY CALCULATION**

### **1. What are the dietary related disorders?**

#### **The Harmful Effects of Poor Nutrition**

- Overweight and Obesity. Eating a healthy diet, along with getting enough physical activity and sleep, can help children grow up healthy and prevent overweight and obesity. ...
- Heart Disease and Stroke. ...
- Type 2 Diabetes. ...
- Cancer.

### **2. What is diabetes nutrition type 1?**

A diet that includes carbohydrates from fruits, vegetables, whole grains, legumes, and low-fat milk is encouraged. People with diabetes are advised to avoid sugar-sweetened beverages (including fruit juice). The ideal amount of carbohydrate intake is uncertain.

### **3. What nutrient deficiency is associated with type 1 diabetes?**

The deficiency of vitamin B12 is also linked with autoimmune diseases, including T1DM. Vitamin B12 is abundant in animal products such as meat, milk, eggs, poultry, eggs, and fish. These show that individuals following vegan diets are more at risk of vitamin B12 deficiency.

### **4. What are the causes of lifestyle disease?**

Four personal behaviors that can affect chronic diseases are: lack of physical activity, poor nutrition, tobacco use, and excessive alcohol use

### **5. What physiological disorders are caused by lifestyle choices?**

Problems like metabolic diseases, joint and skeletal problems, cardio-vascular diseases, hypertension, overweight, violence and so on, can be caused by an unhealthy lifestyle. The relationship of lifestyle and health should be highly considered.

### **6. What is a lifestyle disorder?**

Lifestyle diseases characterize those diseases whose occurrence is primarily based on daily habits of people and are a result of an inappropriate relationship of people with their environment.

### **7. What are the types of lifestyle diseases?**

#### **Some lifestyle diseases examples are:**

- Heart disease.
- Atherosclerosis.
- Stroke.
- Respiratory ailments.
- Obesity.
- Type 2 diabetes.

### **8. How can we prevent lifestyle diseases?**

Eating healthy helps prevent, delay, and manage heart disease, type 2 diabetes, and other chronic diseases. A balanced, healthy dietary pattern includes a variety of fruits, vegetables, whole grains, lean protein, and low-fat dairy products and limits added sugars, saturated fats, and sodium.

### **9. What are lifestyle diseases causes and symptoms?**

These diseases are non-communicable diseases. They are caused by lack of physical activity, unhealthy eating, alcohol, substance use disorders and smoking tobacco, which can lead to heart disease, stroke, obesity, type II diabetes and lung cancer.

### **10 What are the serious diseases caused by stress?**

Studies have found many health problems related to stress. Stress seems to worsen or increase the risk of conditions like obesity, heart disease, Alzheimer's disease, diabetes, depression, gastrointestinal problems, and asthma. Before you get too stressed out about being stressed out, there is some good news.

### **11. What is a stress related disorder?**

Trauma and stressor-related disorders are a group of emotional and behavioral problems that may result from childhood traumatic and stressful experiences. These traumatic and stressful experiences can include exposure to physical or emotional violence or pain, including abuse, neglect or family conflict.

### **12. What mental disorders are caused by stress?**

Robust evidence suggests that chronic stress plays a significant role in the onset of severe and impairing psychiatric conditions, including major depressive disorder, bipolar disorder, and posttraumatic stress disorder.

### **13. What is the most serious type of stress?**

The main harmful types of stress are acute stress, chronic stress, and episodic acute stress. Acute stress is usually brief, chronic stress is prolonged, and episodic acute stress is short-term but frequent. Positive stress, known as eustress, can be fun and exciting, but it can also take a toll.

### **14. What are the 4 types of cardiovascular disease?**

**There are four main types of CVD:**

- coronary heart disease.
- stroke.
- peripheral arterial disease.
- aortic disease

### **15. What are the classification of cardiovascular disease?**

Cardiovascular disease, also known as heart disease, refers to the following 4 entities: coronary artery disease (CAD) which is also referred to as coronary heart disease (CHD), cerebrovascular disease, peripheral artery disease (PAD), and aortic atherosclerosis.



**16. What type of disorder is hypertension?**

High blood pressure is a common condition that affects the body's arteries. It's also called hypertension. If you have high blood pressure, the force of the blood pushing against the artery walls is consistently too high. The heart has to work harder to pump blood.

**17. What causes hypertension?**

What causes high blood pressure? High blood pressure usually develops over time. It can happen because of unhealthy lifestyle choices, such as not getting enough regular physical activity. Certain health conditions, such as diabetes and having obesity, can also increase the risk for developing high blood pressure.

**18. What are the 4 types of obesity?**

Four phenotypes of obesity have been described, based on body fat composition and distribution: (1) normal weight obese; (2) metabolically obese normal weight; (3) metabolically healthy obese; and (4) metabolically unhealthy obese. Sarcopenic obesity has been characterized, related to all the described phenotypes.

**19. What types of cancer are related to food?**

High-fat, low-fibre diets may increase the risk of many cancers including bowel, lung, prostate and uterine cancers. Reducing alcohol intake and maintaining a healthy body weight may reduce the risk of many cancers.

**20. What are 5 major complications of diabetes?**

Common diabetes health complications include heart disease, chronic kidney disease, nerve damage, and other problems with feet, oral health, vision, hearing, and mental health.

**21. What is the disease associated with ulcers?**

Peptic ulcer disease (PUD) is characterized by discontinuation in the inner lining of the gastrointestinal (GI) tract because of gastric acid secretion or pepsin. It extends into the muscularis propria layer of the gastric epithelium. It usually occurs in the stomach and proximal duodenum

**22. What is electrolytic disorder?**

An electrolyte imbalance occurs when you have too much or not enough of certain minerals in your body. This imbalance may be a sign of a problem like kidney disease. Electrolytes are minerals that give off an electrical charge when they dissolve in fluids like blood and urine.

**23. What are the disorders of water balance?**

As will be described in the following sections, hyponatremia is primarily due to the intake of water that cannot be excreted, hypernatremia is primarily due to the loss of water that has not been replaced, hypovolemia represents the loss of sodium and water, and edema is primarily due to sodium and water retention

**24. What is the most common disturbance of water balance?**

In humans, the most common type of dehydration by far is isotonic (isonatraemic) dehydration. Water balance disorders are generally treated by increasing water intake and reducing or stopping fluid loss.

**25. What are indices of health?**

The Health Index provides a single value for health that can show how health changes over time. It can also be broken down to focus on specific topics to show the factors that influence these changes. The Health Index measures health at local authority, regional and national levels

**26. What are the preventive measures for nutritional disorders?**

The best way to avoid nutritional deficiencies is by eating a well-balanced diet. Focus on the following foods to help boost vitamin and mineral intake: Green, leafy vegetables. Orange and red produce.

**27. How do you calculate energy balance in nutrition?**

**The complete energy equation looks like this:**

1. Energy balance = energy input – energy output.
2. Weight gain = energy input > energy output.
3. Weight loss = energy input < energy output.

**28. How do you prepare a healthy diet?**

**8 tips for healthy eating**

1. Base your meals on higher fiber starchy carbohydrates. ...
2. Eat lots of fruit and veg. ...
3. Eat more fish, including a portion of oily fish. ...
4. Cut down on saturated fat and sugar. ...
5. Eat less salt: no more than 6g a day for adults. ...
6. Get active and be a healthy weight. ...
7. Do not get thirsty. ...
8. Do not skip breakfast.

**PART-B**  
**[First Half]**

1. Discuss about Type I Disorders and Causes of life style briefly.
2. Discuss about type 1 disorder and stress related diseases.
3. Discuss about type 1 disorder and Cardio-vascular diseases.
4. Discuss about type 1 disorder and hypertension, obesity.
5. Explain Type-II Disorders: Cancer, diabetics.
6. Explain type -II disorders: ulcers, electrolyte.
7. Explain type -II disorders and water imbalance.
8. Explain about the Health indices, Preventive and remedial measures.
9. Explain the Energy balance and methods to calculate individual nutrient and energy needs.
10. Write briefly about the Planning a healthy diet.

## **UNIT-V CONSUMERS ON GM FOODS AND CONTEMPORARY ISSUES**

### **1. What is GM food short note?**

Genetically modified foods (GM foods), also known as genetically engineered foods (GE foods), or bioengineered foods are foods produced from organisms that have had changes introduced into their DNA using various methods of genetic engineering.

### **2. What is the global status of GM foods?**

The farming of GM crops has massively increased since the mid 1990s. In 1996, just 1.7 million hectares (MHa) were planted with GM crops globally but by 2015, 179.7 million hectares of GM crops were grown, accounting for over 10% of the world's arable land.

### **3. What are the consumer perceptions of GMO?**

Survey respondents held overall neutral but slightly negative perceptions of GM products. While they agreed GM products could help increase food production, they also perceived GM products to cause illnesses such as cancer, autism, allergies, and gluten intolerance.

### **4. What is one main concern with transgenic crops?**

Research indicates that GM crop technology can result in a net increase in herbicide use and can foster the growth of herbicide resistant weeds. In addition, there is concern that the use of GM crops may negatively impact the agriculture ecosystem.

### **5. What are 3 GM foods?**

Many GMO crops are used to make ingredients that Americans eat such as cornstarch, corn syrup, corn oil, soybean oil, canola oil, or granulated sugar. A few fresh fruit and vegetables are available in GMO varieties, including potatoes, summer squash, apples, papayas, and pink pineapples.

### **6. What are 3 safety concerns when using GMOs?**

Health risks associated with GM foods are concerned with toxins, allergens, or genetic hazards.

### **7. What are the risks of GM crops?**

Environmental concerns include : the risk of outcrossing, where genes from GMO foods pass into wild plants and other crops. a negative impact on insects and other species. reduction in other plant types, leading to a loss of biodiversity.

### **8. What is the process of GM food production?**

For GM plants, the bacterium most frequently used is called *Agrobacterium tumefaciens*. The gene of interest is transferred into the bacterium and the bacterial cells then transfer the new DNA to the genome of the plant cells. The plant cells that have successfully taken up the DNA are then grown to create a new plant.

### **9. How are GM foods classified?**

GM foods are classified into one of three generations. First-generation crops have enhanced input traits, such as herbicide tolerance, better insect resistance, and better tolerance to environmental stress.

### **10. What are GM free ingredients?**

Non-GMO or GMO-free ingredients are from crops that have not been genetically altered using novel genetic engineering or DNA manipulation techniques. These modifications are different from traditional cross-breeding or hybridization. GMOs are found extensively in major crops grown in the United States, such as: Corn.

### **11. How are genetically modified foods produced?**

GM is a technology that involves inserting DNA into the genome of an organism. To produce a GM plant, new DNA is transferred into plant cells. Usually, the cells are then grown in tissue culture where they develop into plants.

### **12. Which agency is involved in regulation of GM foods?**

FDA regulates most human and animal food, including GMO foods. In doing so, FDA makes sure that foods that are GMOs or have GMO ingredients meet the same strict safety standards as all other foods.

### **13. Who is on GMO?**

GM foods currently available on the international market have passed safety assessments and are not likely to present risks for human health. In addition, no effects on human health have been shown as a result of the consumption of such foods by the general population in the countries where they have been approved

### **14. What are the regulatory agencies in India for genetically engineered products?**

Currently, the Genetic Engineering Approvals Committee, a body under the Ministry of Environment and Forests (India) is responsible for approval of genetically engineered products in India. If the bill is passed, the responsibility will be taken over by the Environment Appraisal Panel, a sub-division of the BRAI.

### **15. What can be achieved with genetically modified organisms?**

Some benefits of genetic engineering in agriculture are increased crop yields, reduced costs for food or drug production, reduced need for pesticides, enhanced nutrient composition and food quality, resistance to pests and disease, greater food security, and medical benefits to the world's growing population.

### **16. What are the advantages of genetically modified organisms?**

- Food supplies become predictable. ...
- Nutritional content can be improved. ...
- We receive medical benefits from GMO crops. ...
- It creates foods that are more appealing to eat. ...
- Genetically modified foods are easier to transport. ...
- Herbicides and pesticides are used less often. ...
- GMO crops may cause antibiotic resistance.

### **17. What are the benefits of genetically modified animals?**

The benefits include advancing human health, enhancing food production, reducing environmental impact, optimizing animal health and welfare and production of cutting-edge industrial applications.

### **18. What bacteria is used in GMO?**

The species *Escherichia coli* and *Bacillus subtilis* can be genetically engineered to synthesis and excrete chymosin, providing a more efficient means of production.

### **19. What is the importance of food and nutrition in human health?**

Nutrition is a critical part of health and development. Better nutrition is related to improved infant, child and maternal health, stronger immune systems, safer pregnancy and childbirth, lower risk of non-communicable diseases (such as diabetes and cardiovascular disease), and longevity. Healthy children learn better.

### **20. What is food in nutrition?**

Food can be defined as anything solid or liquid which when swallowed, digested and assimilated in the body provides it with essential substances called nutrients and keeps it well. It is the basic necessity of life. Food supplies energy, enables growth and repair of tissues and organs.

**PART-B**  
**[First Half]**

1. Explain the Global perspective of consumers on GM foods;
2. Explain the Major concerns of transgenic.
3. Explain the foods GM ingredients in food products and labeling.
4. Explain the foods GM ingredients and bioavailability.
5. Explain the foods GM ingredients and safety aspects.
6. Write the regulatory agencies involved in GM foods.
7. Case studies- GM foods.