**ASSIGNMENTS Date:30th Feb 2019**

1. **Explain types of Carbohydrates and five functions of Carbohydrates in Human Body**

Carbohydrates represent a broad group of substances, which include the sugars, starches, gums and celluloses. The common attributes of carbohydrates are that they contain only the elements carbon, hydrogen and oxygen, and that their combustion will yield carbon dioxide plus one or more molecules of Water. The simplest carbohydrates are the three-carbon sugars, which figure importantly in intermediary metabolism, and the most complex are the naturally occurring polysaccharides, primarily of plant, origin. Carbohydrates make up three-fourths of the biomass of plants but are present only in small quantities in the animal body as glycogen, sugars and their derivatives. Glycogen is often referred to as animal starch because it is not present in plants. Derived monosaccharides such as the sugar acids, amino sugars and the deoxysugars are constituents of all living organisms. **These are the types of carbohydrates**

* + Starches (also known as complex carbohydrates).
  + Sugars.
  + Fiber

**These are the five function of carbohydrates in human body**

* + Providing energy and regulation of blood glucose.
  + Sparing the use of proteins for energy.
  + Breakdown of fatty acids and preventing ketosis.
  + Biological recognition processes.
  + Flavor and Sweeteners

1. **For the following nutrients, can you say why they are important and name three sources? Are these foods micronutrients or macronutrients? . Carbohydrates. Proteins . Fats and oils.**

*They provide energy carbohydrates* fats, and proteins provide the energy your body needs to carry out all the biochemical reactions that occur throughout the day (and night). The energy is measured in calories (kilocalories, technically, but we usually just call them calories). Gram for gram, fat has more calories than either carbohydrates or protein; one gram fat has nine calories, and the other two have four calories per gram.

*They're necessary for body structures.* Fats, proteins, and minerals are used as raw materials to build and maintain tissues, organs and other structures such as bones and teeth. Carbohydrates aren't on this list, but your body can take any extra carbohydrates and convert them into fat, which can be stored in adipose tissue.

*They help regulate body functions.* All six classes are involved in regulating various body functions such as sweating, temperature, metabolism, blood pressure, thyroid function, along with many others. When all of the different functions are in balance, your body is said to be in homeostasis.

Carbohydrates, proteins, and fats are called macronutrients because they're large, and energy nutrients because they provide the fuel your body needs to do things. Vitamins and minerals are called micronutrients because they're much smaller in comparison. That doesn't mean they're less important; they're still essential nutrients, but you only need little bits.

Micronutrients can be classified by whether they're soluble in fat or soluble in water. Vitamins A, D, E, and K are fat-soluble, and the B-complex vitamins and vitamin C are water-soluble. Minerals are grouped as major minerals or trace minerals, depending upon how much of each mineral is necessary.

1. **What nutrient deficiency do the following clinical signs/symptoms indicate? (a) Pallor (b) Goitre (c) Bitot’s spots (d) Bilateral pitting oedema (e) Severe visible wasting.**

**Clinical signs** of **nutrient deficiency** include: **pallor** (on the palm of the hand or the conjunctiva of the eye)Pallor is a pale color of the skin that can be caused by illness, **emotional shock** or stress, stimulant use, or **anemia**, and is the result of a reduced amount of oxyhaemoglobin and is visible in skin or mucous membrane. Pallor is more evident on the face and palms. It can develop suddenly or gradually, depending, **Bitot’s spots** on the eyes which is lack of vitamin A helping your body's natural defence against illness and infection (the immune system) work properly, helping vision in dim light , keeping skin and the lining of some parts of the body, such as the nose, healthy **pitting oedema:** **Observable swelling of body tissues** due to fluid accumulation that may be demonstrated by applying pressure to the swollen area (such as by depressing the skin with a finger). If the pressing causes an indentation that persists for some time after the release of the pressure, the edema is referred to as pitting edema Swelling in the ankles, feet and legs is often caused by a build-up of fluid in these areas,.Causes of edema include, Eating too much salt, Sunburn ,Heart failure, Kidney disease, Liver problems from cirrhosis, Pregnancy, Problems with lymph nodes, especially after mastectomy, Some medicines, Standing or walking a lot when the weather is warm

**Goitre** is coursed by lack of **Iodine in the body helps make thyroid hormones, which help keep cells and the metabolic rate (the speed at which chemical reactions take place in the body) healthy** Causes of this swelling include:Underactive thyroid (hypothyroidism), Overactive thyroid (hyperthyroidism), Lack of iodine in your diet. Iodine is a mineral found in milk, fish and some plant foods and as an additive in table salt, Too much iodine in the diet, Pregnancy or menopause, Some medication, including lithium, Radiation exposure, Thyroid cancer **and severe visible wasting**:

The main symptoms of wasting syndrome are its defining factors, the loss of weight from muscle and fat deterioration. Secondary symptoms include: **Diarrhea** or **vomiting** lasting for 30 days or more. Progressive weakness over a 30 day period. A fever lasting for several days. Loss of appetite or **anorexia.** Severe acute malnutrition is defined by a very low weight for height (below -3z scores of the median WHO growth standards), by visible severe wasting, or by the presence of nutritional oedema. Decreasing child mortality and improving maternal health depend heavily on reducing malnutrition, which is responsible, directly or indirectly, for 35% of deaths among children under five

1. What is the impact of malnutrition on communities? How can you help prevent some of the negative effects of malnutrition?.

Pregnant and lactating women and young children less than three years are most vulnerable to malnutrition.Scientific evidence has shown that beyond the age of 2-3 years, the effects of chronic malnutrition are irreversible. This means that to break the intergenerational transmission of poverty and malnutrition, children at risk must be reached during their first two years of life.Child malnutrition is the single biggest contributor to under-five mortality due to greater susceptibility to infections and slow recovery from illness.

Children who do not reach their optimum height or consistently experience bouts of weight loss during childhood are affected in the long term in numerous ways. They do not reach their optimum size as adults (and so may have less physical capacity for work), their brains are affected (resulting in lower IQs) and they are at greater risk of infection (which kills many children during their early years).

Child malnutrition impacts on education attainment. The degree of cognitive impairments is directly related to the severity of stunting and Iron Deficiency Anaemia. Studies show that stunted children in the first two years of life have lower cognitive test scores, delayed enrolment, higher absenteeism and more class repetition compared with non stunted children. Vitamin A deficiency reduces immunity and increases the incidence and gravity of infectious diseases resulting in increased school absenteeism.

Child malnutrition impacts on economic productivity. The mental impairment caused by iodine deficiency is permanent and directly linked to productivity loss. The loss from stunting is calculated as 1.38% reduced productivity for every 1% decrease in height while 1% reduced productivity is estimated for every 1% drop in iron status (source Haddad and Bouis, 1990).

Maternal malnutrition increases the risk of poor pregnancy outcomes including obstructed labour, premature or low-birth-weight babies and postpartum haemorrhage. Severe anaemia during pregnancy is linked to increased mortality at labour.

Low-birth-weight is a significant contributor to infant mortality. Moreover, low birth-weight babies who survive are likely to suffer growth retardation and illness throughout their childhood, adolescence and into adulthood. Growth-retarded adult women are likely to carry on the vicious cycle of malnutrition by giving birth to low birth-weight babies.Computer software called [PROFILES](http://www.aedprofiles.org/) has been created by the [Academy for Educational Development (AED)](http://www.aed.org/) to calculate the magnitude of malnutrition in terms of mortality, morbidity, mental capacity and economic productivity. The impact is calculated over a ten-year period and is based on the prevalence data from National Demographic Health Surveys. Costs and benefits can be quantified to provide the cost-benefit ratio of high impact nutrition interventions. Findings are then used as a basis for advocacy and awareness raising with politicians, institutional providers, donors and the general public.

The advent of ready-to-use therapeutic food (RUTF) products has greatly improved the coverage and effectiveness treatment for severe acute malnutrition (SAM).The excitement surrounding this development has led to rapid expansion of SAM treatment activities, often without regard to the prevalence of SAM, the capacity of local health systems to absorb expansion, or the contribution of SAM to overall child mortality. In the context of limited health budgets, on epidemiological and ethical grounds treatment approaches are in most situations a less rational public health investment than approaches that prevent SAM and other types of malnutrition While the risk of death due to severe malnutrition is eight times greater than normal, the *number* of children who die due to an association with malnutrition is much greater for moderate and mild malnutrition. That is,a smaller risk applied to a much larger number gives more events. To reduce child deaths due to malnutrition necessarily requires addressing mild and moderate malnutrition..

1. **Who are the individuals most vulnerable to vitamin A deficiency, iodine deficiency disorder and iron deficiency anaemia in your community?. Imagine you have identified people in your community who are suffering from vitamin A deficiency, iodine deficiency disorder and iron deficiency anaemia. What can you do to address these problems**

Vitamin A deficiency exists when the chronic failure to eat sufficient amounts of vitamin A or beta-carotene results in levels of blood-serum vitamin A that are below a defined range. Beta-carotene is a form of pre-vitamin A, which is readily converted to vitamin A in the body. Vitamin A deficiency can be treated with vitamin A supplements. The amount of supplements depends upon the age of the child. Vitamin A supplements can reverse night blindness and help the eyes become properly lubricated again. However, vision loss caused by scarring from corneal ulcers cannot be reversed

Severe iodine deficiency results in impaired thyroid hormone synthesis and/or thyroid enlargement (**goiter**). Population effects of severe iodine deficiency, termed iodine deficiency disorders (IDDs), include **endemic goiter**, **hypothyroidism**, cretinism, decreased fertility rate, increased infant mortality, and mental retardat...Iodine deficiency disorders (IDD) are linked to iodine deficient soil. Due to glaciations, flooding, rivers changing course and deforestation the iodine present in top soil is constantly leached.

The first treatment for iodine deficiency is an increase in the amount of iodine in the diet. This usually involves an increased intake of iodized table salt. This option is easy and inexpensive, making it a viable treatment solution for people across the world. Iron deficiency anemia is a **condition where your blood lacks adequate healthy red blood cells**. It typically is caused by an insufficient amount of iron in the body. This can result from numerous causes including lack of iron in your diet, iron absorption issues, or blood loss in the body from an ulcer, polyp, cancer or some other illness. Depending on the cause, iron deficiency anemia treatment may involve:

* + Medications, such as oral contraceptives to lighten heavy menstrual flow
  + Antibiotics and other medications to treat peptic ulcers
  + Surgery to remove a bleeding polyp, a tumor or a fibroid

1. **Identify at least four ways in which fiber helps us maintain a healthy digestive system.**

Fiber plays a major role in digestive health. Fiber is the fuel the colon cells use to keep them healthy. Fiber also helps to keep the digestive tract flowing, by keeping your bowel movements soft Dietary fiber, found particularly in green leaves vegetables, fruits, beans, and whole grains, helps to keep bowel movements regular. Individuals who consume high — fiber diets have much lower rates of constipation than individuals that eat a low — fiber diet, plus they have fewer hemorrhoids diverticula (outpouchings) in the colon. Too much fiber may result in loose stools, bloating, or even diarrhea. Dietary fiber is the term used to describe the combination of both insoluble and soluble fibers. Soluble fiber is the form of fiber that dissolves in water. Examples of foods that contain soluble fiber include fruits, oats, legumes and barley. Insoluble fiber comes from plant cell walls and does not dissolve in water. Examples of foods that contain insoluble fiber include wheat, vegetables, and seeds. Fiber works by both bulking up the stool and retaining water. In addition, bacteria help digest the fiber which produces healthy ingredients for the colon such as short chain fatty acids. Fiber can be beneficial for both diarrhea and constipation depending how much fluid is also taken in with the fiber. Fiber can actually become a constipating agent if the ratio of fluid taken in is too low.