Hand book for

HEALTH AND FITNESS

(Part V- Theory Paper Course Material)

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UNIT I

PHYSICAL FITNESS

Health

The English word “health” comes from the old English word hale, meaning “wholeness, a being whole, sound or well”.

Health means soundness of body and mind in which its functions are duly and efficiently discharged.

“Health is a state of complete physical, mental and social well being and not merely an absence of diseases or infirmity” – defined by World Health Organization

Physical health

Physical health can be defined as a state in which all the body parts anatomically intact and perform their physiological functions perfectly and harmoniously.

Here are some important key facts about good health:

- absence of disease
- proper nutrition
- bodyweight management
- abstaining from drug abuse
- avoiding alcohol abuse
- responsible sexual behavior (sexual health)
- hygiene and getting the right amount of sleep

Mental health

Mental health refers to people’s cognitive and emotional well-being.

According to World Health Organization (WHO), mental health is “a state of well-being in which the individual realizes his or her own abilities and can cope with the normal stresses of life, can work productively and fruitfully and is able to make a contribution to his or her community”.

- Having a mental aptitude near or above social average.
- Having the ability to understand the social structure.
- Having a reasonable ability to make judgments regarding good and bad or right and wrong.
- Having the ability to remember and reproduce information collected through various senses or through learning to a reasonable degree.

Social Health

Social health is the ability to get along with one self and with others. It prompts us to be independent but at the same time to realize how dependent one in others.

- Having family and friends
- Having some kind of social support system
- Heeling part of a community
- Connecting to other humans and animals

Fitness

Fitness comprises of two related concepts. They are general fitness and specific fitness.

General fitness is a state of health and well-being

Specific fitness is an ability to perform specific aspects of sports or occupations and daily activities.

Physical Fitness

Physical fitness is the body's ability to function efficiently and effectively. It consists of health related physical fitness and Skill related physical fitness. Each has different components which contribute total quality of life.

Health Related Physical Fitness Components

- **Muscular Strength** is the ability of muscles to lift a heavy weight or exert a lot of force one time.
- **Muscular Endurance** is the ability to - muscles for a long period of time without tiring.
- **Cardio-respiratory endurance** is defined as the ability of the heart to get oxygen rich blood to the required working muscles.
- **Flexibility** is the ability to move through a full range of motion.
- **Body composition** is the relative amount of body mass to fat which is also known as body fat percentage.

Skill Related Physical Fitness Components

- **Agility** is the ability to change body positions quickly and keep the body under control when moving.
- **Balance** is the ability to keep the body in a steady position while standing and moving.
- **Coordination** is the ability of body parts to work together when you perform an activity.
- **Power** is an ability to the rate at which one can perform work. Power is considered to be a combination of strength and speed.

- **Speed** is the ability of a person to execute motor movements with high speed in the shortest period of time.
- **Reaction time** is the ability to move quickly once a signal is received.

Physical fitness can be understood by examining the following five basic components.

- **Strength** is the ability to overcome resistance or to act against resistance.
- **Endurance** is the ability to do sports movements, with the desired quality and speed under conditions of fatigue.
- **Speed** is the ability to execute any motor movements in shortest possible time.
- **Flexibility** is the ability to take a joint through a range of motion passively.
- **Coordinative abilities** are primarily dependant on the motor control and regulation processes of Central Nervous System.

Warm- up

It is a primarily preparatory activity in which through physiological and psychological preparation for an athlete to adjust himself for the fulfillment of the main activity.

Types of Warm- up

1. General Warm-Up

In general warming up, an athlete undertakes a series of physical movements of general nature for the whole body such as jogging, striding, stretching, calisthenics.

2. Specific Warm-Up

In specific warming up, athletes under take some movements which are to be performed later on especially during the performance of a main activity or competition. Example: sprinter's short distance running .

Importance of warm-up

- It raises the core body temperature, which improves physical work efficiency.
- It increases the lung ventilation which supplies more oxygen.
- It results in the removal of lactic acid which helps in improving the endurance.
- It improves the range of motion in the joints.
- It reduces tension and nervousness
- It improves the concentration required for the main task

Cool-down

Lowering down the intensity of the work/ training session/competition by performing limbering and stretching exercises followed by deep breathing relaxation exercises is called cool-down or limbering down.

Cooling down is also essential to avoid pooling down of blood in veins, which causes fatigue.

Stretching Exercises

Stretching exercises are performed actively, passively or with partner assistance to take a muscle to the point of tension for a period of 15-30 seconds. Before and after exercises are performed to prevent muscle cramps or injury to the muscle or joint.

UNIT - II

FOOD AND NUTRITION

Food and nutrition are the way that we get fuel, providing energy for our bodies. We need to replace nutrients in our bodies with a new supply every day.

Nutrition

Nutrition is defined as the science of food, the nutrients and other substances; they are in action, interaction and balancing in relation to health and disease.

Food

The edible stuff that provides us with nutrients is termed as food. Food is broadly classified as cereals, pulses, vegetable, fruits, milk, eggs, flesh foods, fats and sugars.

Nutrients

Nutrients are the constituents in food that must be supplied to the body in suitable amounts. These include proteins, fats, carbohydrates, minerals, water and vitamins.

Constituents of food

1. Carbohydrates

They are the chief source of energy in our diet. They are chemical compound containing carbon, hydrogen and oxygen. They provide instant energy to our body.

The chief sources of carbohydrates are: rice, wheat, maize, barley, potato, sugarcane, beetroot, banana, etc.

- Carbohydrates are of three types-
- Sugars
- Starch
- Cellulose

Sugars are called simple carbohydrates. They provide instant energy.

Sugars are present in

- Milk
- Grapes
- Banana
- Sugarcane
- Beetroot.

Starch is found in

- Potato
- Rice
- Wheat
- Maize

2. Proteins

Proteins are body-building food. They are essential for the growth and repair of the body tissues. Proteins are made up of amino acids.

Proteins can be classified into two groups depending on their source:

i) Animal proteins

- milk
- cheese
- egg
- fish
- meat

ii)Vegetable proteins

- pulses
- soya beans
- cashew nuts
- groundnuts
- barley

Animal proteins are considered to be better than vegetable proteins as they are more easily digested and absorbed by the body.

Daily requirement of proteins

adults -1 gram per kg body weight

Children - 2 to 3.5 grams per kg body weight

Enzymes are chemical substances that take part in several chemical reactions. Enzymes are chemically proteins.

3. Fats

Fats like carbohydrates are energy-giving foods but are greatly concentrated sources of energy. When one gram of fat burnt, it gives 9 calories of energy. Fats are made up of carbon, hydrogen and oxygen.

Fats can be classified as

Animal fats

- Butter
- Ghee
- Milk
- Fish
- meat

Vegetable fats

- Groundnut oil
- Sunflower oil
- Mustard oil
- Sesame oil

A major part of the food we eat is used to derive energy for day-to-day activities. A small part of the remaining food is converted into fat and stored in the body. Thus fats constitute an energy bank in the body.

4. Vitamins

Vitamins are necessary for normal growth and good health of an individual and shortage of one or more vitamins in the body results in deficiency diseases in the individual.

Vitamins do not provide energy like the carbohydrates and fats.

The various vitamin rich foods are

- Vitamin A (liver, red pepper, sweet potatoes, carrot, dark leafy greens and dried herbs)
- Vitamin B (crude rice, wheat bran, raw garlic, liver, fish and sunflower seeds)
- Vitamin B 12 (shellfish, liver, fish egg, octopus, fish, crab, lobster, beef, mutton, cheese and egg)
- Vitamin C (hot chili pepper, guavas, dark leafy greens, cauliflower, papaya, orange and strawberries)
- Vitamin D (liver oil, fish, dairy products, eggand mushroom)
- Vitamin E (sunflower seeds, pine nuts, peanutsand cooked spinach)
- Vitamin K (herbs, dark leafy greens, springonion, cabbage and cucumber)

Most of the vitamins cannot be produced by our body. Since no single food item contains all the vitamins, we must eat a variety of foods to obtain all the vitamins our body requires.

5. Minerals

In addition to carbohydrates, fats, proteins and vitamins, our body also requires minerals like

- Iron (liver, pumpkin seeds, nuts, beef, beans and dark leafy greens)

- Calcium (cheese, almonds, dairy products, green leafy vegetables and dried herbs)
- Phosphorus (wheat, cheese, corn, chicken, sunflower seeds and garlic)
- Iodine (baked potatoes, milk, iodized salt, boiled eggs, banana, strawberries, lobster andgreen beans)
- Sodium (baking soda, soups, sauces, cured meats, sun dried tomatoes, pickled foods and gravies)
- Zinc (oysters, roasted beef, dried watermelon, crab and peanuts)
- Copper (liver, oyster, nuts, lobster, sunflower seeds, roasted pumpkin seeds and dried herbs)

6. Water

Water forms about 70% of our body weight and is an important constituent of all body cells. Water is required for all the biological processes in our body.

It performs the following functions in the body:

- Water transports food, wastes, gases and other chemicals (like hormones) throughout the body.
- Water helps in digestion by dissolving the nutrients which can then be absorbed or digested by the body.
- Water carries waste out of the body as sweat and urine.
- Water helps to regulate the body temperature. The amount of water needed by a person depends on one's age, type or work and climate.

7. Roughage

The cell walls of all plant cells are made up of cellulose. Cellulose cannot be digested by our digestive system. Cellulose forms the fiber content of our diet and is referred to as roughage. Roughage provides the alimentary canal muscles with bulk against which they contract easily.

Balanced Diet

'A balanced diet is that contains the proper amounts of each nutrient'.

Functions of Diet

- It provides energy for the various activities of the body.
- It helps the body to grow and replace worn out tissues.
- It has chemical elements which help to control the body functions and protect the body from diseases.

Food Intake

Daily Intake Guide thumbnails contain nutrition information about each product to help you maintain a balanced diet. Daily intake Guide thumbnails look like this:

Daily intake Guide Labeling is a simple way of showing the amount of nutrients a food contributes to a person's diet. It shows the percentage of daily requirements for energy and other nutrients (eg. carbohydrate, protein, fat, salt, fibre) contained in one serving of the food.

The recommended Daily Intake for an average adult each day are:

Food Component	**Reference Value for Daily Intake**
Energy	8700kJ
Protein	50g
Fat	70g
Saturated Fat	24g
Carbohydrate	310g
Sugars	90g
Dietary Fibre	30g
Sodium	2300mg

Water in the body

Water is arguably the second most important compound and oxygen being the first. The human brain is made up of 95% water, 82% of blood and 90% of lungs.

Importance of water

- Water serves as a lubricant
- Water forms the base for saliva
- Water forms the fluids that surround the joints.
- Water regulates the body temperature, as the cooling &heating is distributed through perspiration.
- Water helps to alleviate constipation by moving food through the intestinal tract and thereby eliminating waste
- Water helps to regulate metabolism.

Junk Food

Junk food is an informal term for food that is of little nutritional value and often high in fat, sugar, and/or calories.

Common junk foods

- salted snack foods
- gum
- candy
- sweet desserts
- fried fast food and
- Carbonated beverages.

Junk food is bad for many reasons:

- It causes obesity, diabetes and many other sicknesses.
- A junk food can be addictive and it affects the some part of our brain as a drug which causes us to take more sugar to satisfy our cravings.
- Junk food is comfort food and with all things that comfort they also take away.
- It causes the skin to get wrinkles in younger age so that junk food eater seems to be an old in their young age.

Malnutrition

Malnutrition is the condition that results from taking an unbalanced diet in which certain nutrients are lacking, in excess (too high an intake), or in the wrong proportions.

Malnutrition increases the risk of infection and infectious disease, and moderate malnutrition weakens every part of the immune system.

Over nutrition

Over nutrition occurs by eating too much of food frequently or habitually and it becomes dangerous to our health.

Under nutrition

Under nutrition is the opposite of over nutrition, meaning that it is a nutrient deficiency from not eating enough food. Under nutrition usually affects the balance of all the nutrients in our body.

Causes of under nutrition

We can divide the causes of under nutrition into immediate, underlying and basic.

Immediate causes are:

- Poor diets. meals may be low in quantity, nutrient density or variety or eaten infrequently. Infants may get in sufficient breast milk.
- Disease, particularly HIV/AIDS, diarrhea, respiratory tract or ear infections, measles, hookworms and other gut parasites.

Underlying causes are:

- Family food insecurity
- Inadequate care of vulnerable household members (e.g. ‘unfair’ sharing of food within families)
- Unhygienic living conditions (e.g. poor water supplies and poor sanitation)
- Inadequate health services

Basic causes are:

- Poverty
- Lack of information, political and economic insecurity
- War
- Lack of resources at all levels, unequal status ofwomen, and/or natural disasters

Consequences of over nutrition

Obesity

Obesity is a condition of accumulating fat much more than is necessary for the body. This form of over-nutrition is more common in developed countries. Obesity makes a person bulky and over-weight which may be a result of genetic, endocrine and behavioral factors. In addition to psychological and emotional disturbances, obesity often leads to social humiliation and other complications. Obese people are more prone to diabetes, tuberculosis, cardiovascular irregularities, hypertension, arthritis and respiratory problems. Obesity increases the risk of complications during surgery, pregnancy and childbirth. Obese women appear to be more prone to menstrual irregularities and infertility.

Body Mass Index

Body Mass Index (BMI) is a number calculated from a person’s weight and height. BMI provides a reliable indicator of body fatness for most people and is used to screen for weight categories that may lead to health problems.

Calculation of BMI

BMI is calculated the same way for both adults and children.

The calculation is based on the following formulas:

Measurement Units	**Formula and Calculation**
Kilograms and meters (or centimeters)	Formula: weight (kg) / [height (m)]2 With the metric system, the formula for BMI is weight in kilograms divided by height in meters squared. Since height is commonly measured in centimeters, divide height in centimeters by 100 to obtain height in meters Example: Weight = 68 kg, Height =165 cm (1.65 m) Calculation: 68 ÷ (1.65)2 = 24.98

Interpretation of BMI for adults

For adults 20 years old and older, BMI is interpreted by using standard weight status categories that are the same for all ages and for both men and women. For children and teens, on the other hand, the interpretation of BMI is both age- and sex specific.