Unit 8

PHYSIOLOGY AND SPORTS

Key Points :

1. Gender differences in Physical and Physiological parameters
2. Define Physiology & Physiological factors determining component of Physical fitness
3. Organic system of Human Body
4. Physical Fitness & its component
5. Effects of exercises on different Organic System
(a) Cardio-Vascular System
(b) Respiratory System
(c) Muscular System.
6. What is meant by Ageing? Explain the followings:-
(a) Physiological changes due to ageing
(b) Contribution of exercise to maintain functional fitness in aged population

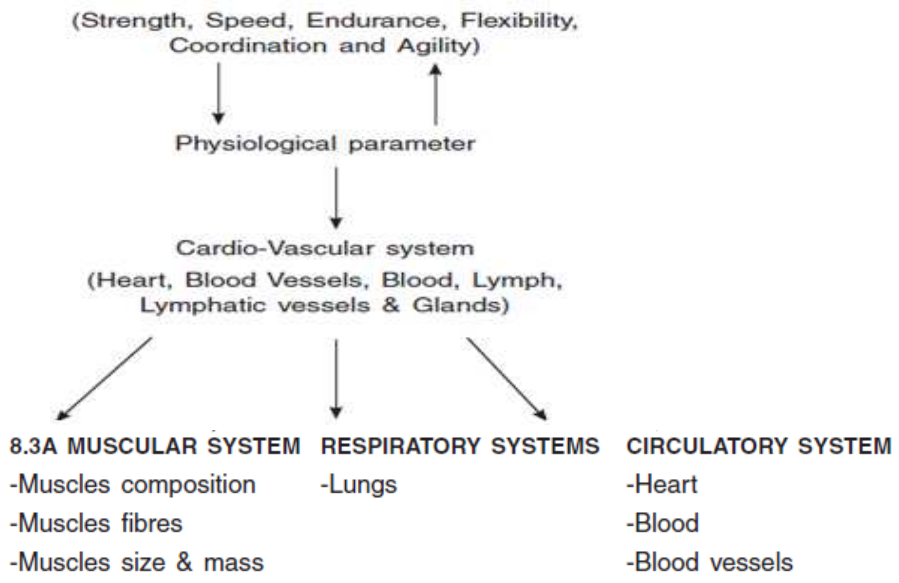
8.1 Gender Differences in Physical & Physiological parameters

Gender the state of being male & female through bio-logical division of an organism on the basis their reproductive systems"

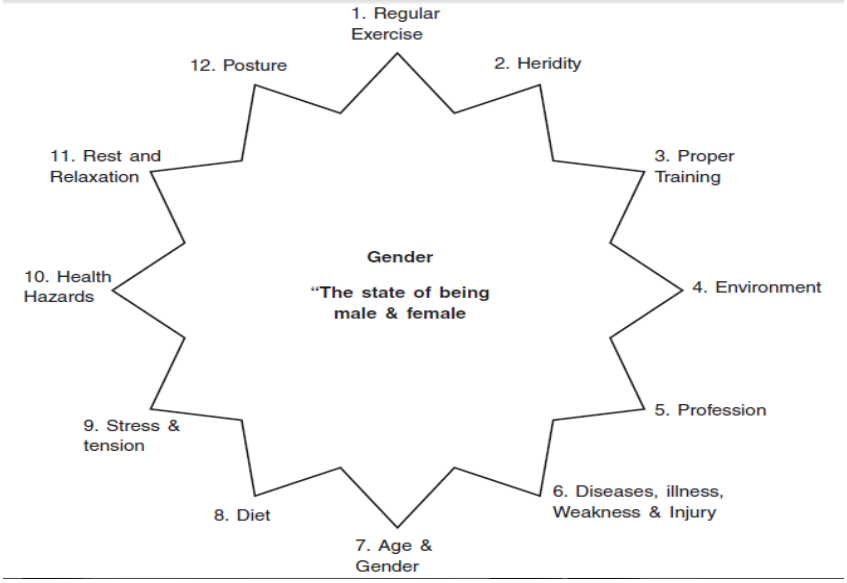
No	Parametes	Male	Female
PHYSICAL PARAMENTS	Height	Taller	Shorter
	Body Mass	More	Less
	Body Fat	More	Less
	Lean Body Mass	Less	More
	Limbs Length	Less	More
	Arms Length	Less	More
	Skeleton System		
	Head	Broader	Shorter
	Face	Broader	Shorter
	Protuding Chin	Bigger	Smaller
	Organs		
	Stomach	Smaller	Bigger
	Kidney	Smaller	Bigger
	Liver	Smaller	Bigger
	Appendix	Smaller	Bigger
	Thyroid glands	Smaller	Bigger
	Strength	50% more	Less
	Endurance	More	Less
	Speed	More	Less

PHYSICAL FITNESS COMPONENTS	Flexibility	Less	More
	Coordination & Agility	Less	More
PHYSIOLOGICAL COMPONENTS	**Muscular system**		
	Muscle, mass & size	More	Less
	Muscle's Competition	More	Less
	Metabolic Power	Less	More
	Tendon & Bone attachment	More	Less
	Circulatory system		
	Heart size	Bigger	Shorter
	Blood composition	More(45% in Volume)	Less(42% in Volume)
	Plasma	Less(54% in Volume)	More(57% in Volume)
	Vital capacity	More	Less
	VO2 max	More	Less
	Lactate threshold	More	Less
	Stroke volume	More	Less
	Level of Cholestrol	More	Less
	Recovery phase	More	Less
	Blood pressure	Less	More
	Heart rate	Less(70-72 Min)	More(72-80/ Min)
	Respiratory system		
	Lung Size	Bigger	Smaller
	Alveloi	More	Less
	Tidal Volume	More	Less
	Residual Value	More	Less
	Gas Exchange	More	Less

8.2 Physiology & Sports Physical Fitness

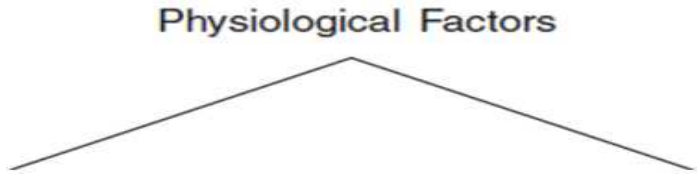


8.3B Factors affecting in Physical & Physiological fitness



8.4 Physiological factors determine components of Physical fitness

Physiology means, "The science dealing with the functions of living organism [A Branch of biology that deals with the functions of organs, tissues and cells of an organism (living)]



Biological Factor:

- Heredity
- Stress & tension
- Age & gender

Physical Factors

Environment

a. Physical

b. Social

- Posture
- Health problem
- Infection
- Drugs & alcohol
- Smoking
- Rest, relaxations, recreation

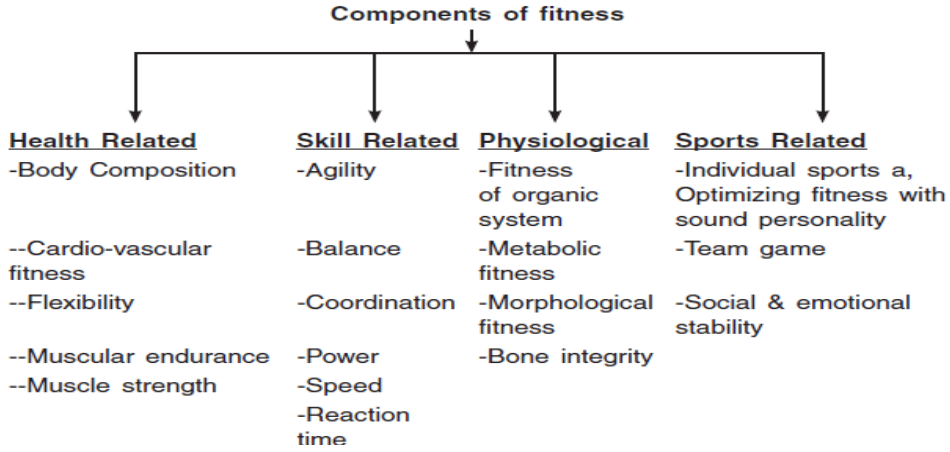
Exercise
Balance diet
Life style

Organic System:-

- Skeletal system
- Digestive system
- Muscular system
- Respiratory system
- Excretory system

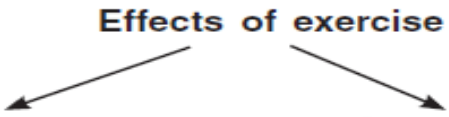
Endocrine system
Reproductive system
Nervous system
Circulatory system

8.4 "Physical Fitness is the total functional capacity of an individual to perform a given task effectively, without undue fatigue"



8.5 (a) Effect of Exercise on Cardio-Vascular System

Cardio Vascular system means to deliver oxygen and nutrients to the body parts to Produce energy & remove waste material from it



Immediate effects

- Increase heart rate
- Increase breathing rate
- Increase blood flow in the body
- Increase blood pressure
- Increase cardiac output
- Increase in stroke volume
- Increase blood volume
- Decrease cholesterol level
- Fast recovery period

Long term effects

Decrease in basic heart rate
Increase the efficiency of heart rate
Increase in heart size
Increase cardiac output
Increase no of capillaries
More effective blood distribution

- Delay fatigue
- Increase in stroke volume

8.5 (b) Effects of Exercise on Respiratory system

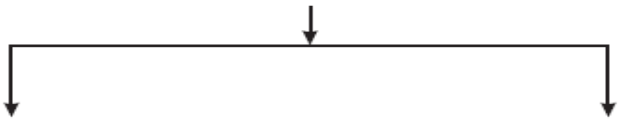
"Respiratory system is a mechanism to take oxygen inside and throw away carbon dioxide'

Respiration:- It is the process of oxygen supply to the cell for the Oxy-dative energy from the nutrients and transport of carbon dioxide and the waste material from the cell.

Organ of respiratory system

l. Nose
2. Pharynx
3. Trachea
4. Bronchi
5. Bronchioles
6. Lungs

Effects of exercise



Improve tidal volume	Avoid second wind
Improve vital capacity	Increase will power
Faster recovery rate	Improve performance
Improve gas exchange capacity	Increase lung's capacity
Improve maximum oxygen uptake	Improve capacity for acclimatization
Improve aerobic capacity	

8.5 (c) Effects of exercise on Muscular system

"Muscle is a specialized tissue, which enables the body and it's part to move and give shape to the body"

Effects of Exercise

1. Change in shape and size of muscle
2. Muscle hypertrophy skeletal
3. More energy supply to muscle
4. Reaction time
5. Capillarization
6. Reduction in fat
7. Muscular endurance
8. Posture
9. Controls extra fat
10. Delays fatigue

11. Increase food storage
12. Strength and speed

8.6 Physiological changes due to ageing

"Ageing is a gradual and continuous irreversible process that results in structural and functional alteration"

Physiological Changes due to Ageing:-

- Sensory Organs
  a. Hearing
  b. Vision
  c. Taste & smell
  d. Touch & skin
- Skeleton system
  a. Bones
  b. Joints
- **Muscular System**
  a. Muscle tissue
  b. Muscle fiber
- **Nervous System**
  a. Brain
  b. Nerve
- **Cardiovascular System**
  a. Heart-Arteries & Veins-Blood circulation
  b. Lungs-Air sacs

Urinal system
a. Bladder
b. Pelvic muscle weakness-female
c. Prostate-male
d. Kidney

Digestive system
a. Dehydration
b. Infection
c. Enzymes
d. Metabolism
e. Abdoman

-Endocrine
a. Harmons
b. Body composition

-General characteristics
a. Skin
b. Hair
c. Height
d. Sleep

8.7 Role of physical activities maintaining functional fitness in aged population

- Reduce the loss of muscle mass
- Helps in maintaining bone density
- Reduce risk of cardio-vascular diseses
- Improve flexibility & strength
- Enhance the lung capacity
- Slowdown the brain ageing
- Improve the mental & social health
- Reduce the risk of age-linked diseases
  A. Diabetes
  B. Obesity
  C. Hypertension
  D. Bad cholesterol
- Improve brain function