

HUMAN ANATOMY AND PHYSIOLOGY-I, BP-101(T)

UNIT-II (Integumentary system)

CLASS-3

TOPIC – Introduction to Skeletal system, Divisions of Skeltal system and Types of bone

- The word skeleton comes from the Greek word skeleton meaning “dried up”.
- It is strong yet light adapted for its function of body protection and motion.
- The skeletal system includes bones, joints, cartilages and ligaments.
- The joint gives the body flexibility and allow movements to occur.
- But from structural point of view, the human skeletal system consists of two main types of supportive connective tissue:
 1. Bone
 2. Cartilage.

Functions of the skeletal system:

1. **Support:** It forms the internal framework that supports and anchors all soft organs.
2. **Protection:** Bones protect soft body organs.
3. **Movement:** Skeletal muscles attached to the skeletal system use the bone to levers to move the body and its part.
4. **Storage:** Fat is stored in the internal cavities of bones.
Bone itself serves as a storehouse of minerals. The most important being calcium and phosphorus.
5. **Blood cell formation:** It occurs within the marrow cavities of certain bones.

Divisions of the Skeleton:

The adult human skeleton usually consists of 206 named bones. These bones can be grouped in two divisions:

1. Axial skeleton

- The 80 bones of the axial skeleton form the vertical axis of the body.
- They include the bones of the head, vertebral column, ribs and breastbone or sternum.

2. Appendicular skeleton.

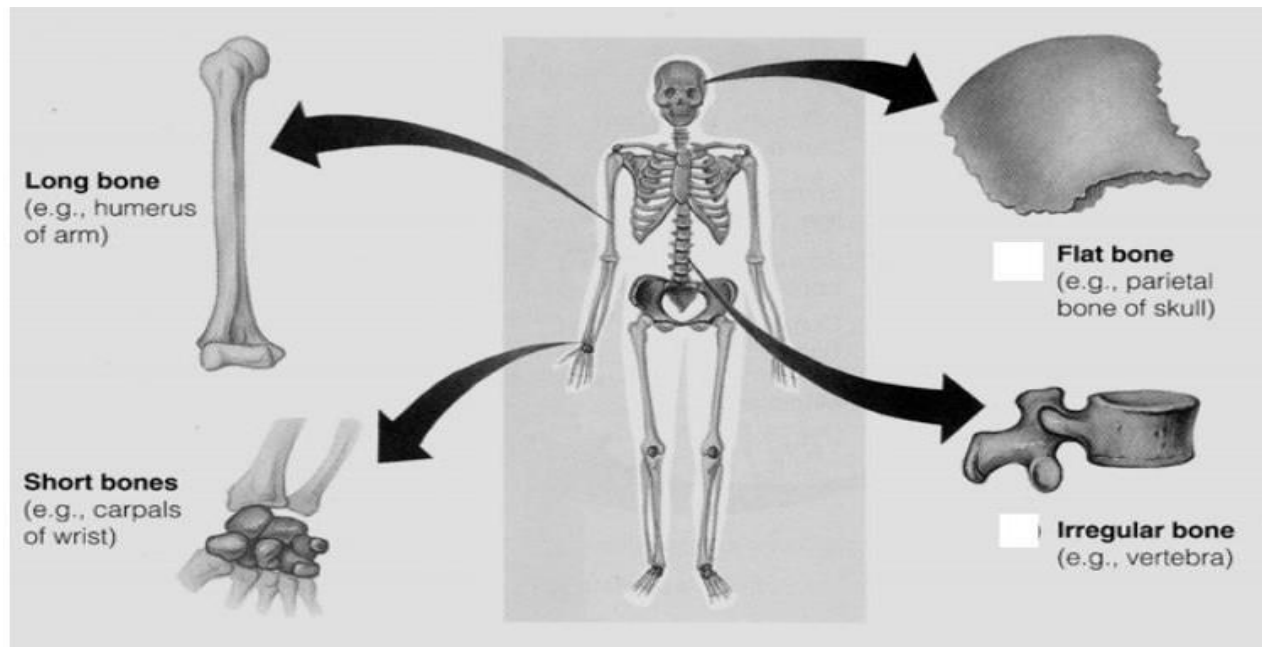
- The appendicular skeleton consists of 126 bones and includes the free appendages and their attachments to the axial skeleton.
- The free appendages are the upper and lower extremities, or limbs, and their attachments which are called girdles.

BONE:

- Bone (osseous) is specialized connective tissue that has the strength of cast iron and lightness of pinewood.
- Living bone is not dry, brittle or dead.
- It is a moist changing, productive tissue that is continually resorbed, reformed and remodeled.

Types of bone:

1. **Long bone:** are called long as its length is greater than its width.
 - The most obvious long bones are in the arm and leg. They act as levers that are pulled by contraction of muscles.
2. **Short bones:** are about equal in length, width and thickness, which are shaped with regular orientation.
 - They occur in the wrist and ankle.
3. **Flat bones** are thin or curved more often they are flat.
 - This includes ribs, scapulae, sternum and bone of cranium. Irregular bones, they do not fit neatly into any other category. Examples are the vertebral, facial, and hip bone.
4. **Sesamoid bones** are small bones embedded within certain tendons, the fibrous cord that connects muscle to bones.
 - Typical sesamoid bones are patella and pisiform carpal bone, which are in the tendon of quadriceps femur and flexor carpi ulnaris muscle respectively.
5. **Accessory bones** are most commonly found in the feet.
 - They usually occur in the developing bone and do not fuse completely.
 - They look like extra bones or broken on X-ray.
 - Sutural (wormian) bones are examples of accessory bones.



Structure of Bone Tissue

- There are two types of bone tissue: compact and spongy.
- The names imply that the two types differ in density, or how tightly the tissue is packed together. There are three types of cells that contribute to bone homeostasis.
- Osteoblasts are bone-forming cell, osteoclasts resorb or break down bone, and osteocytes are mature bone cells.
- An equilibrium between osteoblasts and osteoclasts maintains bone tissue.

IMPORTANT QUESTIONS:

2M QUESTIONS:

1. Define skin and its functions.
2. Enlist the layers of skin.
3. Define muscle tone
4. Differentiate osteoclast and osteoblast.
5. Define skeletal system and its functions.
6. Differentiate tendon and ligament.
7. Define muscle contraction.
8. Define neuromuscular junction
9. Explain largest and shortest bones of human body
10. Name the largest nerve of human body.

11. Define: 1. Joint
2. Synovial joint with examples.

5M QUESTIONS:

- 1) Explain the physiology of muscle contraction.
- 2) Write in details about structure and functions of skin.
- 3) Write a note on different types of joints.
- 4) Write features and functions of bones of axial and appendicular skeletal system.
- 5) Write in details about synovial joints and their function with the help of diagram.

10M QUESTIONS:

- 1) Write a note on different types of joints.
- 2) Write features and functions of bones of axial and appendicular skeletal system.
- 3) Write in details about synovial joints and their function with the help of diagram.