

LOCOMOTION AND MOVEMENT

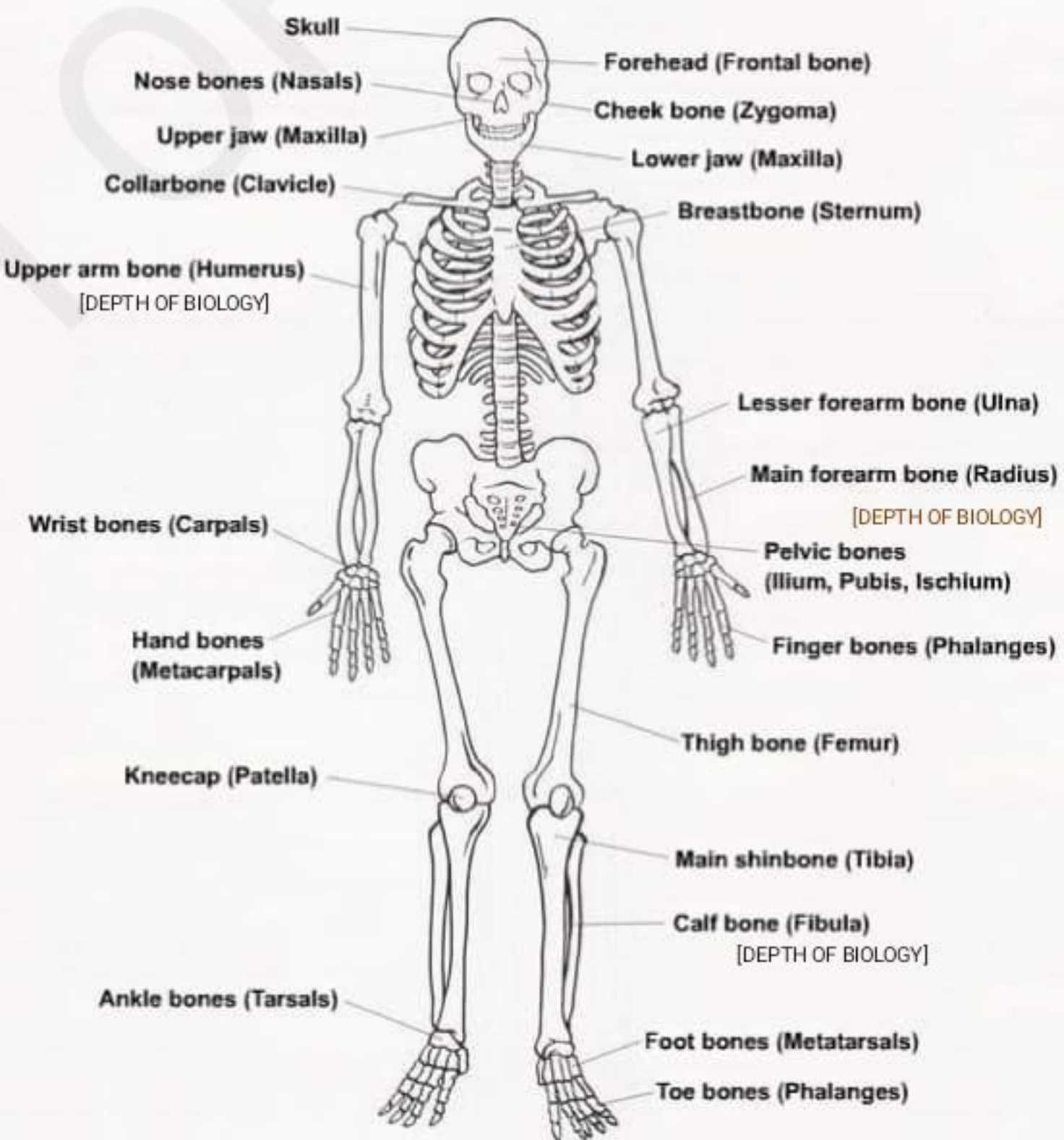
- Human endoskeleton is made up of 206 bones. It is grouped into two parts –
 - Appendicular skeleton – 126 bones.
 - Axial Skeleton – 80 bones.

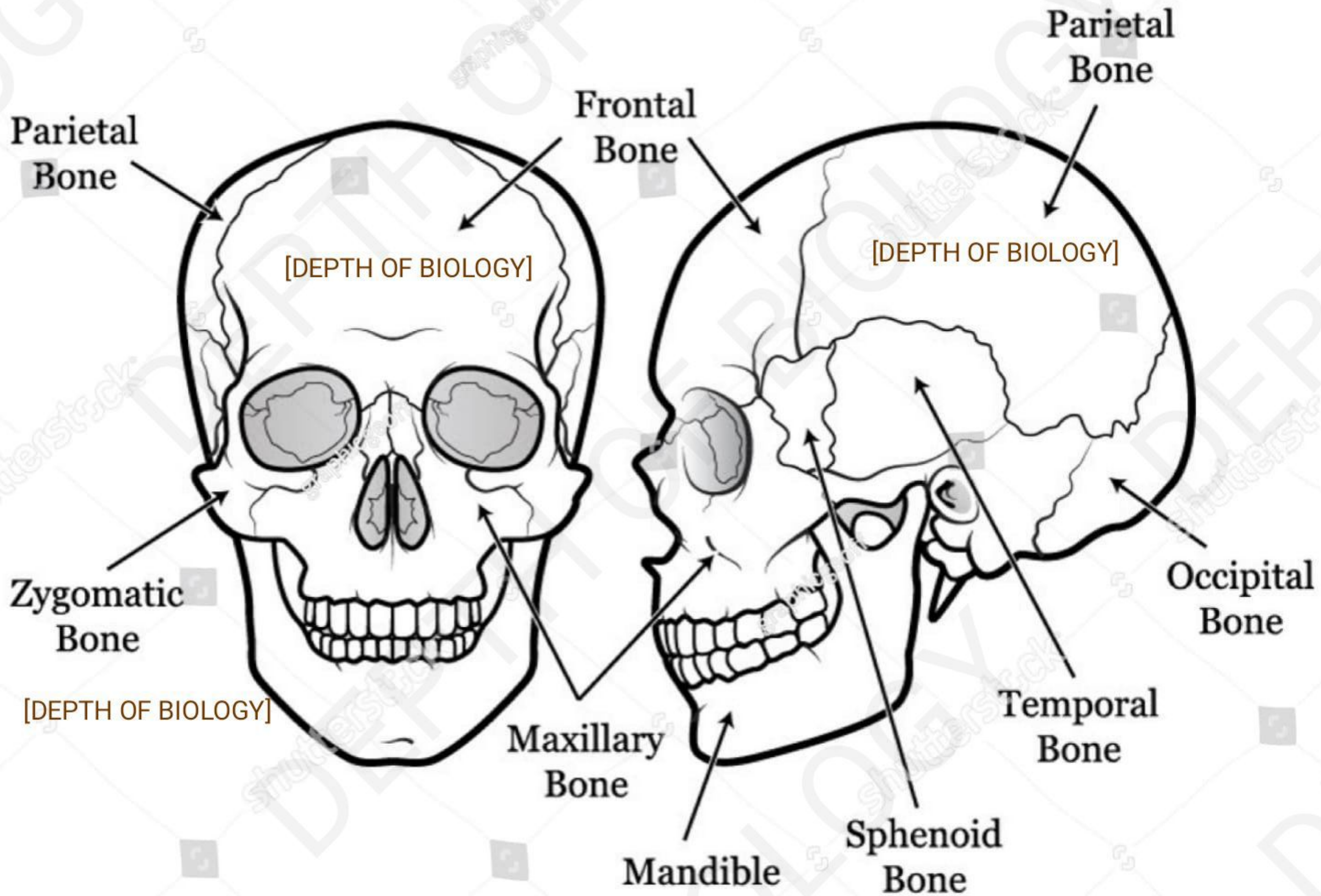
Axial Skeleton

- It consists of skull, vertebral column, sternum and ribs.
 - Skull is composed of cranial and facial bones. Total – 22 bones
 - Cranial bones are 8 in number. Frontal(1), parietal(2), occipital(1), temporal(2), sphenoid(1), ethmoid(1).
 - Facial bones are 14 in number. Mandible(1), maxilla(2), palatine(2), nasal(2), vomer(1), inferior turbinates(2), zygomatic(2), lacrimal bones(2). [DEPTH OF BIOLOGY]
- Each middle ear contains three tiny bones malleus, incus and stapes, collectively called ear ossicles.
- **Hyoid bone:**– A single U-shaped bone which is present at the base of the buccal cavity.
- **Vertebral column:**– Formed by 26 serially arranged vertebrae. Cervical (7) Thoracic (12) Lumbar (5) Sacral (1 fused), coccygeal (1 fused)
- The number of cervical vertebrae are seven in almost all mammals including human beings.
- First vertebra is the atlas and it articulates with the occipital condyles of skull.
 - **Sternum:**– A flat bone on the midventral line of thorax.
 - Ribs – 12 pairs [DEPTH OF BIOLOGY]
 - 1st 7 pairs – True ribs (vertebro-sternal ribs)
 - 8, 9, 10th pairs – vertebro-chondral ribs.
 - 11, 12th pairs – vertebral ribs (floating ribs)
- Each rib is a thin flat bone. It has two articulation surfaces on its dorsal end and is hence called bicephalic.
- Thoracic vertebrae, ribs and sternum together form the rib cage.

Appendicular Skeleton

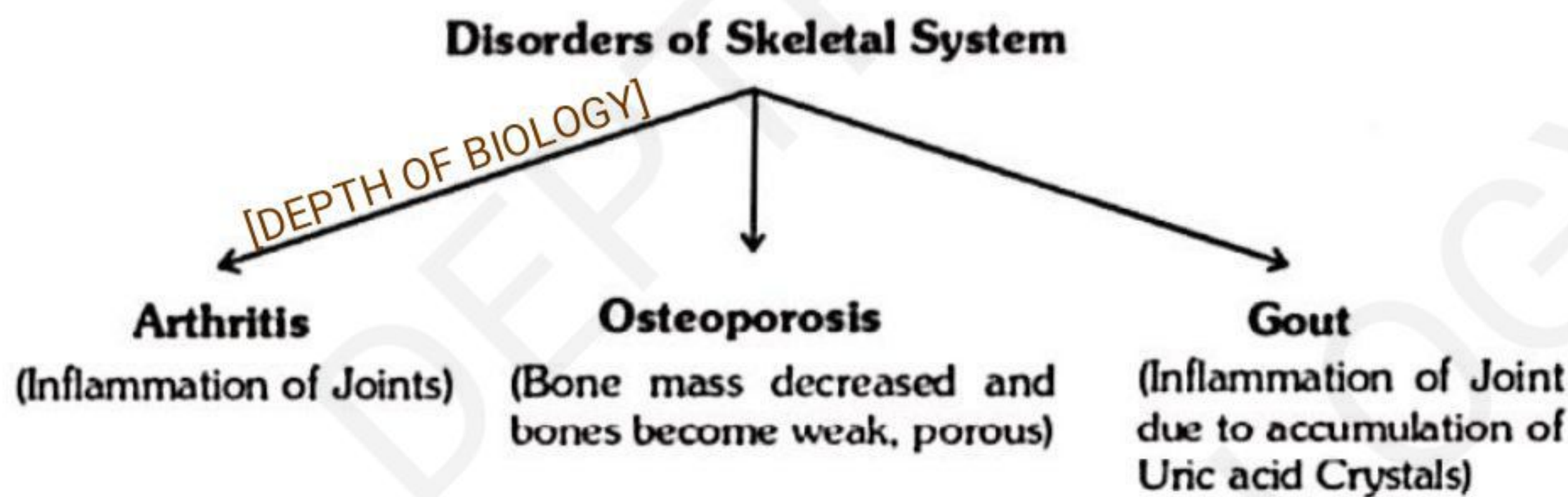
- The bones of limbs along with their girdles.
 - **Fore Limb** – 30 bones. Humerus, radius, ulna, carpals (wrist bones-8) metacarpals (palm-5) phalanges (digits-14)
 - **Hind Limb** – 30 bones. Femur, Patella, Tibia, Fibula, Tarsals (Ankle-7), metatarsals (sole-5), Phalanges (digits-14)
- Femur is the longest bone of body.
- **Pectoral girdle** – Each half is made up of a clavical (collar bone) and a scapula bones.
- Glenoid cavity is a depression in the scapula bone in which the head of the humerus bone articulates and forms the shoulder joint.
- **Pelvic girdle** – It consists of two coxal bones. [DEPTH OF BIOLOGY]
- Each coxal bone is formed by fusion of ilium, ischium and pubis. At the point of fusion of the above bones acetabulum cavity is present in which head of femur articulates. The two halves of the pelvic girdle meet ventrally to form the pubic symphysis containing white fibrous cartilage.





JOINTS

1. **Fibrous joint** – Do not allow any movement e.g.: Sutures (between skull bones)
2. **Cartilaginous Joint** – The bones involved are joined together with the help of cartilage e.g.: Intervertebral disc, pubic symphysis.
3. **Synovial joint** – Characterised by the presence of a fluid filled synovial cavity between the articulating surface of two bones. e.g.: Ball and Socket, Hinge, Pivot, Gliding, Saddle joints.
 - Ball and socket joint (between Humerus and Pectorial girdle)
 - Hinge Joint (Knee Joint, Elbow Joint) [DEPTH OF BIOLOGY]
 - Pivot Joint (between atlas and axis)
 - Gliding Joint (between the carpals, between the adjacent vertebrae).
 - Saddle Joint (between carpal and metacarpal of thumb)



HUMAN SKELETON - 206 BONES

APPENDICULAR SKELETON - 126 BONES

LIMB BONES - 120

FORELIMB BONES - 60

HUMERUS - 1X2

RADIUS - 1X2

ULNA - 1X2

CARPALS - 8X2

METACARPALS - 5X2

PHALANGES - 14X2

HINDLIMB BONES - 60

FEMUR - 1X2

PATELLA - 1X2

TIBIA - 1X2

FIBULA - 1X2

TARSALS - 7X2 [DEPTH OF BIOLOGY]

METATARSALS - 5X2

PHALANGES - 14X2

GIRDLE BONES - 06

PECTORAL GIRDLE - 4

SCAPULA - 1X2

CLAVICLE - 1X2

PELVIC GIRDLE - 2

[DEPTH OF BIOLOGY]

SKULL SKELETON - 29

SKULL BONES - 22

AXIAL SKELETON - 80 BONES

STERNUM - 01 RIBS - 24

TRUE - 14

VERTEBRAL COLUMN - 26

CERVICAL - 7

CRANIAL - 8

FRONTAL - 1

PARIETAL - 2

TEMPORAL - 2

OCCIPITAL - 1

ETHMOID - 1

SPHENOID - 1

FACIAL - 14

MAXILLA - 2

PALATINE - 2

MALAR - 2

NASAL - 2

LACRYMAL - 2

INFERIOR TURBINALS - 2

MANDIBLE - 1

VOMER - 1

FALSE - 10**THORACIC - 12**

LUMBAR - 5

SACRAL - (5)

COCCYGEAL - (4)

[DEPTH OF BIOLOGY]

ASSOCIATED SKULL BONES - 07

HYOID BONE - 1

EAR OSSICLES - 2X3 (MALLEUS , INCUS , STAPES)

Phalangeal formula is 23333**Bones formed by ossification of tendons are called sesamoid bones.****Longest and strongest bone of human body is femur.****Smallest bone of human body is stapes.**

[DEPTH OF BIOLOGY]

Rabbit - axial skeleton 132 bones , appendicular skeleton 128 bones