

Locomotion and Movement :-

Movement which helps in change of place or location (voluntary) is locomotion.

Types of Movement :- 3 - (1) amoeboid (2) muscular (3) ciliary

(1) Amoeboid :- effected by pseudopodia formed by streaming of protoplasm (as in amoeba) in macrophages, leucocytes, cytoskeletal element like microfilament.

(2) Muscular :- uses contractile property of muscles to do locomotion in majority of multicellular organism.

- in limbs, jaws, tongue etc

• Locomotion require coordination of muscular, skeletal and neural system.

(3) Ciliary :- Coordinated movement of cilia ~~in trachea~~

- in trachea to filter dust particle.

- in internal tubular organs (lined by ciliated epithelium), passage of ova through female reproductive tract.

Muscle :- Mesodermal origin, Have excitability, contractility, extensibility and elasticity.

3 types -

(1) Skeletal :- Striped (so also called as striated muscles), under voluntary control (so voluntary muscles), (Near skeleton).

(2) Visceral :- smooth (smooth / unstriated muscles) and involuntary muscle. (in inner wall of hollow visceral organs) like canal or trachea.

(3) Cardiac :- striated and involuntary, branching pattern (in heart).

fascicles

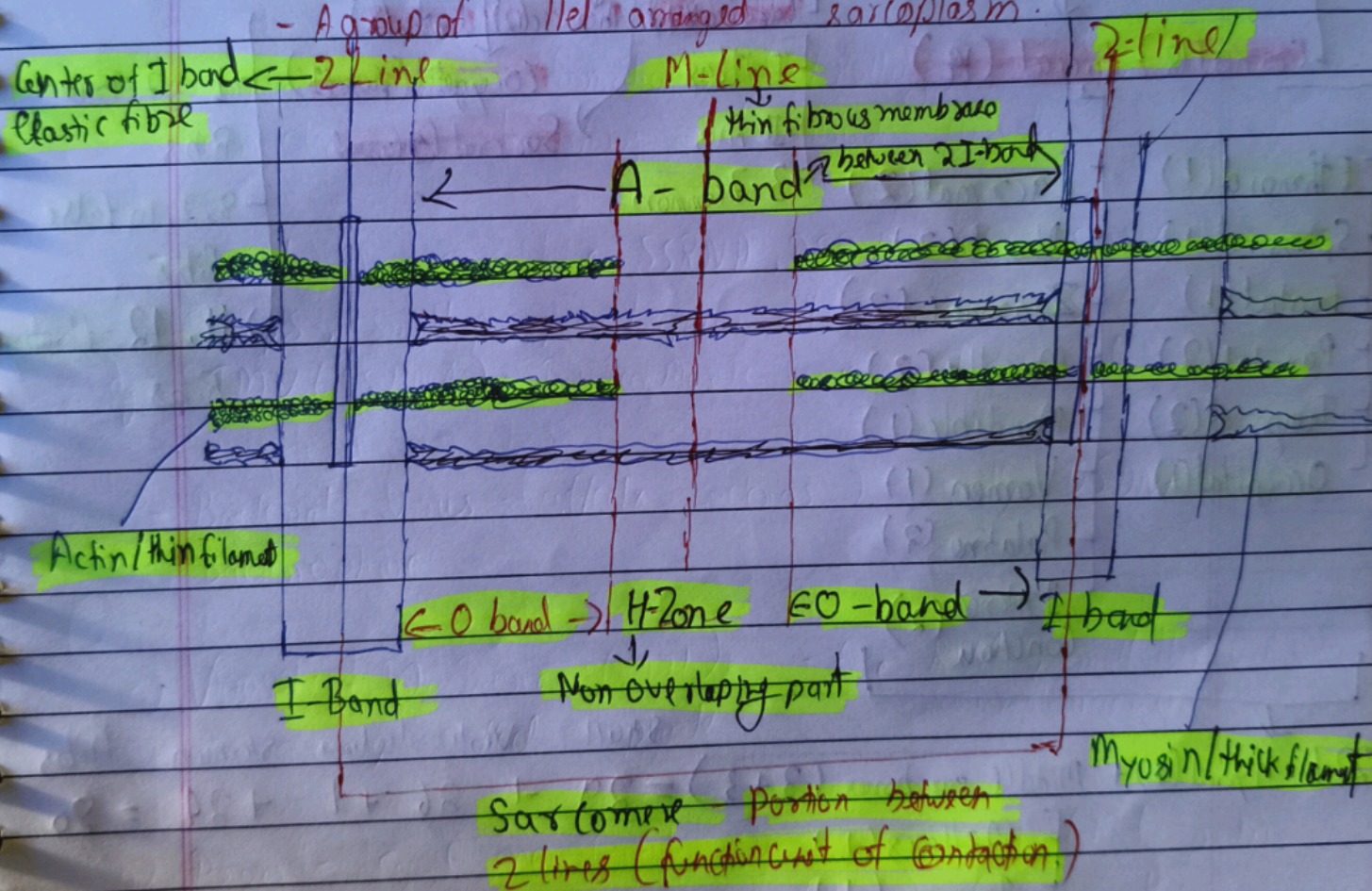
Skeletal muscle detail:- made by number of muscle bundles held together by fascia (collagenous connective tissue)

Muscle fibre by plasma membrane or sarcolemma which enclose sarcoplasm.

Sarcoplasmic Reticulum or endoplasmic reticulum store house of Ca^{++} .

Myofibrils or myofilaments:- have light (due to actin) called I band or isotropic band and dark (due to myosin) called A-band or Anisotropic band.

- A group of well arranged sarcoplasm.

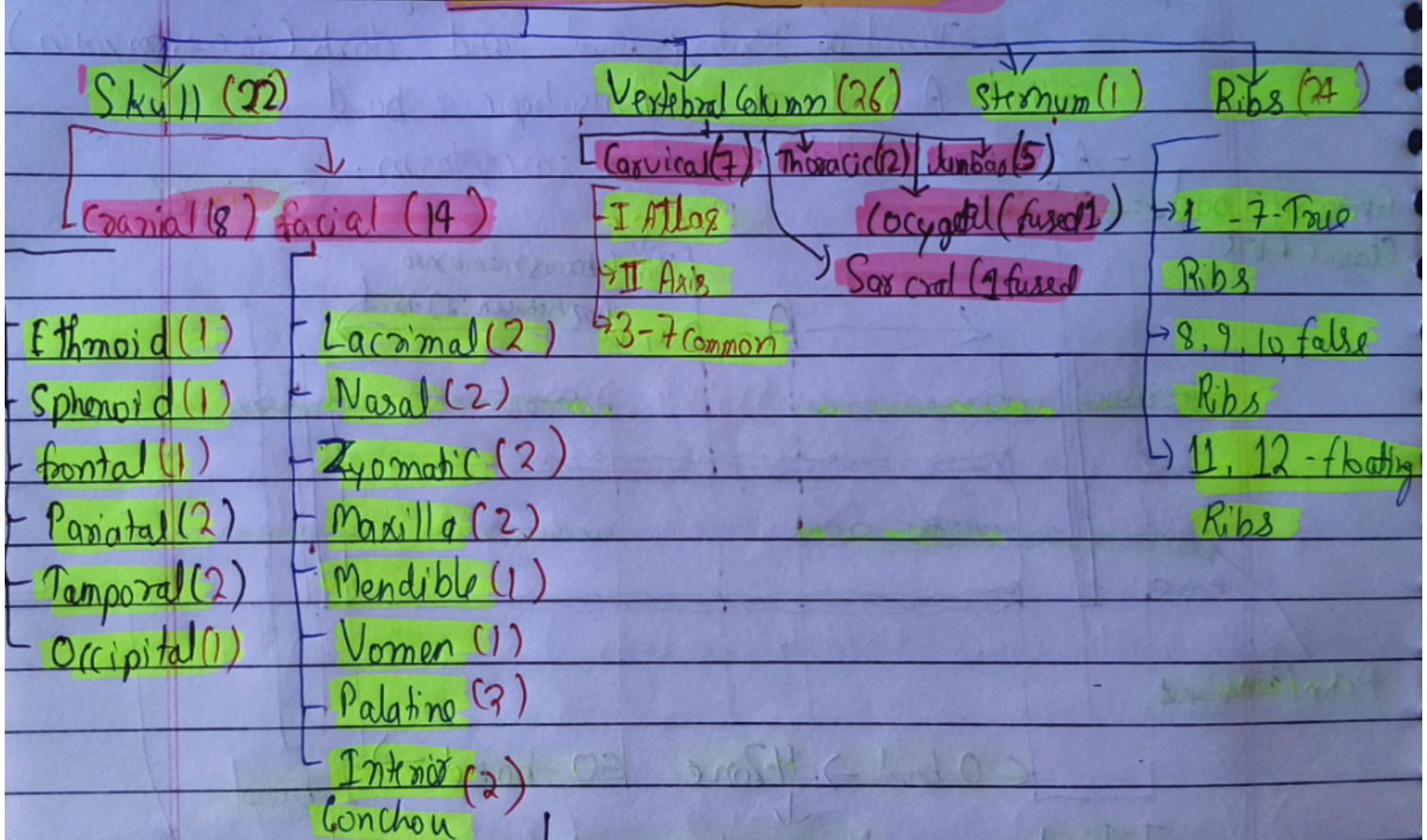


force generating Protein	- Actin & myosin
Regulating Protein	- Tropomyosin & Troponin
Structural Protein	- Z line

Skeletal System :- Bones + Cartilages form work
very hard due to Calcium
slightly pliable matrix due to chondroitin salts

- Total 206 bones, 2 Types
- 1) Axial Skeleton - 80 bones
- 2) Appendicular skeleton - 126 bones

Axial Skeleton (80)



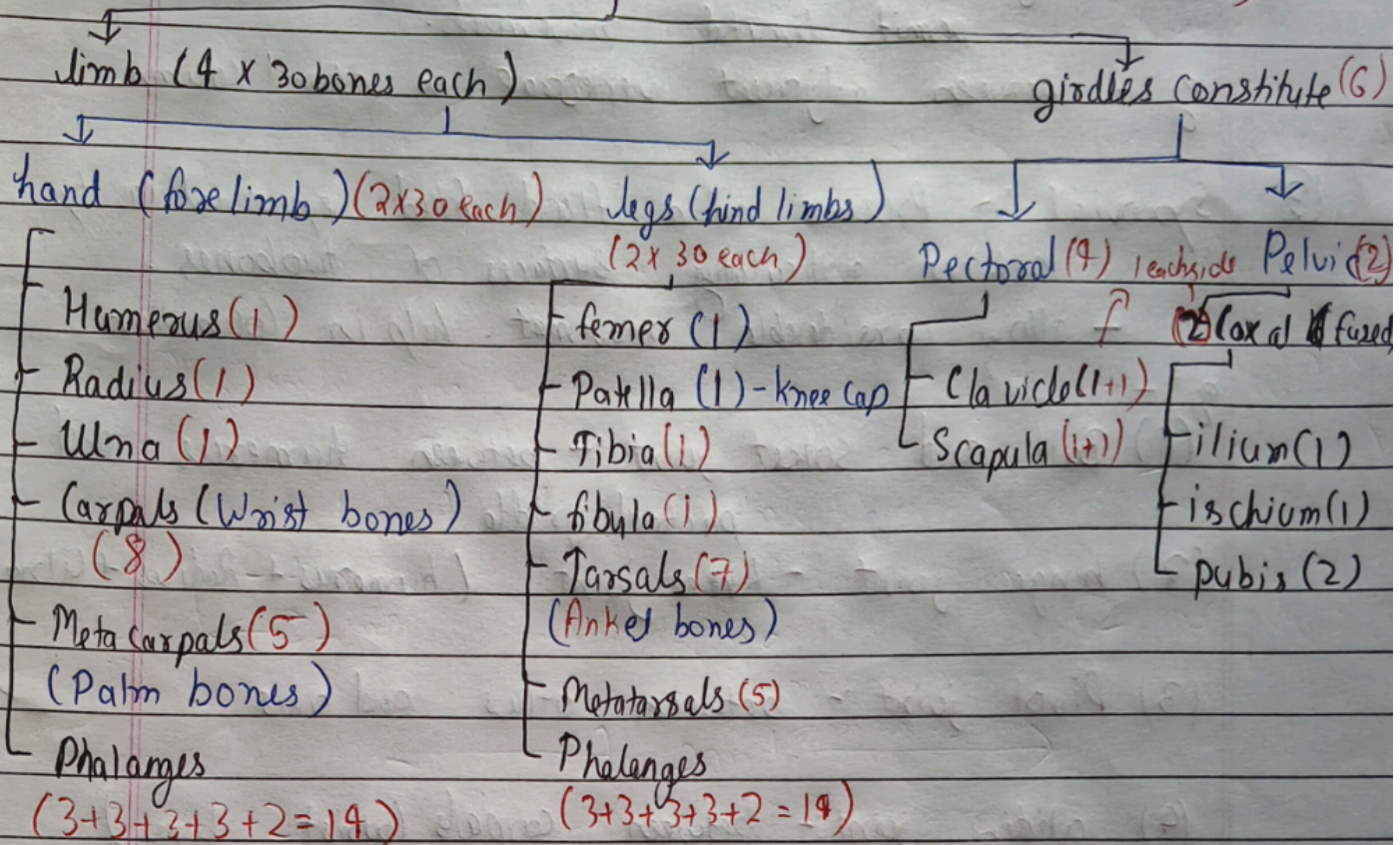
$$22 + \text{hyoid}(1) + \text{middle ear bones}(3+3) = 29 + 26 + 1 + 24 = 80$$

Skull Vertebral column Sternum Ribs

22 + hyoid(1) + middle ear bones (3+3) = 29 + 26 + 1 + 24 = 80

- Malleus (1)
- Incus (1)
- Stapes (1)

Appendicular skeleton system (126)



$$\begin{array}{ccccccc}
 \text{forelimbs} & & \text{hindlimbs} & & \text{Pectoral} & & \text{Pelvis} \\
 \hline
 30 + 30 & + & 30 + 30 & + & 4 & + & 2 \\
 \hline
 (120) \text{ limbs} & + & \text{Clavicle (2)} & + & \text{Scapula (2)} & + & \text{Coxal (2)} \\
 & & & & & & \text{= 126}
 \end{array}$$

Appendicular Skeleton system

Joints $\Rightarrow$ points of contact between bones, or between bones and cartilages -

act as fulcrum. **3 types** -

- ① **fibrous** :- No movement, eg - flat skull bones, fuse end to end with help of dense fibrous connective tissue - in form of sutures, to form the cranium.

(2) Crustilaginous :- joint with cartilage help,
- permit limited movements.

eg:- between adjacent vertebrae in vertebral column.

(3) Synovial :- Presence of a fluid filled synovial cavity
between articulating surfaces of two bones.
- allow considerable movement. help in locomotion.

eg:-

(1) Ball and socket joint :- between humerus and pectoral girdle

(2) hinge joint :- knee joint (humerus + Radius + Ulna)

(3) Pivot joint :- between atlas and axis

(4) gliding joint :- between carpals (wrist bones)

(5) Saddle joint :- between carpals and metacarpal of thumb

for disease and disorder refer to page list on left
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