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**ASSIGNMENT: BIOMECHANICS**

**SUBMITTED TO: SIR,SHAHZEB**

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 **QUESTION NO:1**

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**ANSWER:**

 **BIOMECHAANICS OF ARTICULAR CARTILAGE**

**Articular Cartilage:**

 The smooth white tissue that cover the end of bones where thy come together and form joints.It allow the bone glide over each other with little friction, articular cartilage can be damage by injury or normal wear and tear.Articular cartilage covers bones surface within the joint capsule.

**Function Of Articular Cartilage**

* Distribute join load over a wide area,decreasing the stress sustain by the cartilage joint surface.
* Minimize peak stress on subcondral bone.
* Surface roll or sliding during motion.
* Allow relative movement of the opposing joint surface.
* Provide a friction coefficient of 0.0025.
* Function within a contact pressure range of 2.11Mpa.

**Types Of Articular cartilage**

**1.Hyaline**: found in ribs, nose, treachea, layrnx, and is precuror of bone.

**2.Fibro:** Cartilage is found in discs, joint capsule ligaments.

**3.Elastic**: found in external ear, epiglottis and layrnx.

**Composition And Structure Of Articular Cartilage**

* **CONDROCYTES:** 10%
* **COLLAGEN**:[ fibrous ultra structure, procollagen pollypeptide].
* **PROTEOGLYCAN:** large protein polysaccharied molecules
* **WATE:** inorganic salts, glycoprotiens, lipids,60-80%.

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**QUESTION NO 2:**

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**ANSWER:**

 **BIOMECHANICE OF TENDONS AND LIGAMENT**

**TENDONS:**

Tendons connect muscle to bone.

Tendons consist of bundle of collagenous fibers arrange in parallel.

 Origins at muscle, crosses at least one joint and insert in bone.

**LIGAMENTS:**

Ligaments connect bone to bone.

 Ligaments mostly consist of elastic bundle molecules.

 Origin and insert in bone.

 More elastic and flexible than tendons.

 **FUNCTIONS OF TENDONS AND LIGAMENTS**

**TENDONS:**

Tendons carry tensil force from muscle to bone.

They carry compressive force when wrapped around bone like a pulley.

Proprioception

Secondary function of storage energy.

**LIGAMENTS:**

Maintains and correct the bone and joint geometry.

Ligaments associated joint capsules

Combine function passive joint stablizers.

Secondary function : propioception.

 **MECANICAL PROPERTIES OF LIGAMENTS AND TENDONS**

Both are viscoelastic tissue.

Both exhibit the non linear behavior.

Strength [sustain highly load].

When load is applied enough it cause injury demage, dependent on rate and amount of load.

 **FACTORS THAT EFFECT THE BIOMECHANICAL PRPERTIES OF LIGAMENTS AND TENDONS**

Maturation and aging.

Pregnancy and postpartum period.

Diabetes mellitus.

Grafts.

Mobilization and immobilization.

Steriods.

The five region that can be identified on the stress strain curve of tendon or ligaments are:

1. Toe region
2. Linear or elastic region
3. Progessive failure of plastic region
4. Major failure region
5. Complete failure region.

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