

DPT 2ND SEMESTER (SECTION A)

COURSE TITLE: BIOMECHANICS-I

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FINAL TERM ASSIGNMENT

MARKS: 50

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1- Enlist functions of the following muscles

Deltoid, Trapezius. Latissimus dorsi, Rhomboids, Levator scapulae, Serratus anterior

Pectoralis major minor, Teres major.

Answer:

Functions of Deltoid muscle:

● **Clavicular part:**

- Flexes the arm
- Internally rotates the arm.

● **Acromial part:**

- Arm abduction beyond initial 15°.

● **Spinal part:**

- Extends the arm
- Externally rotates the arm.

Functions of trapezius muscle:

● **Descending part:**

- Extends the head and neck.
- Laterally Flexes the head and neck.
- Rotation of head.

● **Transverse part:**

- Draw scapula medially.

● **Ascending part:**

- Draw scapula inferomedially.

Functions of latissimus Dorsi:

- Extends the flexed arm.
- Adduction of arm.
- Internal rotation of arm.
- Pulls pectoral girdle backward.

Functions of Rhomboids:

- Retraction of scapula.
- Rotation of glenoid cavity.
- Stabilizing of the scapula.

Functions of Levator Scapulae:

- Elevates the scapula.
- Laterally flexes the cervical vertebral column.
- Stabilization of vertebral column.

Functions of serratus anterior:

- Elevates the arm.
- Depression of scapula.
- stabilizes the scapula.
- Rotation of scapula.

Functions of pectoralis major:

- Rotation of arm.
- Abduction of arm.
- Internal flexion of arm.
- Extension of arm.

Functions of pectoralis minor:

- Protracts of scapula.
- Medially rotates the scapula.
- Depresses the scapula.
- Stabilization the scapula.

Functions of teres major:

- Rotates the arm inwards.
- Extension of arm.

2- Name all the ligaments of Shoulder joint and their functions.

Answer:

Shoulder Ligaments:

» The ligaments of the shoulder play a vital role in the Stabilization of the shoulder's bony structure.

There are four shoulder ligaments.

1. Glenohumeral ligament
2. Coraco-acromial ligament
3. Coraco-clavicular ligament
4. Transverse humeral ligament

1. Glenohumeral Ligament:

These joints are the main source of stability. There are 3 glenohumeral ligaments. Superior, middle and inferior.

Function:

- Superior Glenohumeral -- Abduction
- Middle Glenohumeral -- Externally rotates the shoulder.
- Inferior Glenohumeral -- Abducts the shoulder, Externally rotates the shoulder, abducts and internally rotates the shoulder.

2. Coraco-acromial Ligament:

This ligament is a strong triangular band which extend between the coracoid process and acromion.

Functions:

- Play vital role in stability of shoulder.
- CAL connects the acromion and coracoid process of the scapula.

3. Coraco-clavicular ligament:

This ligament is the major vertical stabilizing factor of the acromioclavicular joint runs from the clavicle to the coracoid process of the scapula.

Functions:

- CCL allows complex movement of the shoulder.

4. Transverse humeral ligament:

A ligament that extends between the lesser and greater tubercles of humerus.

Functions:

- THL holds the long head of the biceps tendon within the bicipital groove.

3- Write Individual and combine action of Rotator Cuff muscles.

Answer:

Rotator cuff muscles:

Rotator cuff muscles is a group of four muscles and their tendons.

1. Supraspinatus
2. Infraspinatus
3. Teres major
4. Subscapularis

Functions of rotator cuff muscles:

Rotator cuff muscles have individual and combine functions.

Individual functions of rotator cuff muscles:

Following are the individual functions of rotator cuff muscles.

1. Functions of Supraspinatus:

- Stabilization of shoulder joint.
- Abducts the arm.

2. Functions of infraspinatus:

- Externally rotates the arm.
- stabilizes the shoulder joint.

3. Functions of teres minor:

- Externally rotates the arm.
- Abducts the arm.
- Stabilization of arm.

4. Functions of subscapularis:

- Internally rotates the arm.
- Stabilization of shoulder joint.
- Addiction of arm.

Combined functions of rotator cuff muscles:

The combine functions of rotator cuff muscles is to centralize our humerus bone. when the arm is lifted upward the joint is pulled together by the rotator cuff muscles and stabilizes our shoulder.

4- Define Lateral epicondylitis and explain its physiotherapy treatment.

Answer:

Lateral Epicondylitis:

Also known as "Tennis Elbow".

Definition:

- “Inflammation of tendons that joins the muscles of forearm on outside of elbow.”

✚ A painful condition that is caused when the tendons in your elbow are due to the repetitive motion of wrist and arm.

Causes:

- Due to repetitive motions.
- Cause during a swing.
- By lifting weight.
- Tennis.
- Squash.

Symptoms:

- Pain on outer part of your elbow.
- Burning
- weak grip strength.

Physiotherapy treatment of lateral epicondylitis:

» Lateral Epicondylitis can be treated by physiotherapy.

A physiotherapy treatment which is physiotherapists will recommend you in an epicondylitis clasp, which reduce the strain on elbow.

The pain will be recover within 2 weeks.

Exercises use to relief pain:

A physiotherapist will suggest you some simple exercises to relief pain.

1. Wrist turn:

The elbow is bended at right angle and hand is hold up,palm. Then the wrist will be turned slowly, so that the palm will be facing down.

Hold it for 5 seconds and then release.

2. Wrist turn with weight:

Now repeat the exercise with holding a light weight.

3. Wrist lift:

The elbow is bended at a right angle and then the wrist is slowly bended towards you. Hold it for 5 seconds and then release it slowly.

4. Elbow bend:

The arm is slowly bended upward so your hand touches your shoulder.
Arm is held for 15-30 seconds, this exercise is repeated 10 times.

5- Differentiate between type 1 and type 2 muscle fibers

Answer:

Difference between Type 1 and Type 2 muscle fibers:

Type 1	Type 2a	Type 2b
1.They are called slow twitch muscles fibers.	1.They are called fast twitch muscles fibers.	1.They are fast twitch muscle fibers.
2. They are aerobic.	2. They are anaerobic.	2. They are anaerobic.
3. Oxygen is used as a fuel source.	3. Some of oxygen can be used.	3. No oxygen is used.
4.Type 1 muscles fibers have a network of capillaries which means they have really good blood flow.	4.Type 2a muscle fibers have some capillaries which means they have an Ok blood flow.	4.Type 2b muscle fibers have limited blood capillaries which means they have poor blood flow.
5.They are red in color.	5.They are pink in color.	5.They are white in color.
6.They are slow oxidative.	6.they are fast oxidative-glycolytic.	6.They are fast glycolytic.
7.Slow to fatigue.	7.Medium to fatigue.	7.Fast to fatigue.
8.Aerobic energy system.	8.Lactic acid system.	8.Creatine phosphate system.