

Mid-Term Assignment

Course Title: Biomechanics And Ergonomics I

DPT 2nd semester section B

Instructor: Dr. M. Shahzeb khan (PT)

Marks: 30

Note:

Attempt all questions, all questions carry equal marks.

Answer Briefly and to the point, avoid un-necessary details

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Q1: (A) What is biomechanics and ergonomics?

Ans No 1 (A):

Biomechanics:

Biomechanics is the combination of two words Bio and Mechanics.

Bio means life and Mechanics means is the physical science that deals with the state of rest and motion of bodies under the action of forces.

Definition:

1. Application of mechanical laws to the extremities or structure of living organism.
2. The study of actions of external and internal forces on living body.

(B) why we study biomechanics and ergonomics in physical therapy?

Ans No 1(B):

We study biomechanics in physical therapy to study to study the movement of extremities.

Biomechanics methods are used in the rehabilitation of the organs as mechanics is deals with the study of rest and motion.

Q2: (A) What is shoulder complex? Elaborate it.

Ans No 2 (A): Shoulder Complex:

The shoulder complex is the combination of four joints,

1. Glenohumeral Joint (GH)
2. Acromioclavicular Joint (AC)
3. Sternoclavicular Joint (SC)
4. Scapulothoracic Joint (ST)

> Shoulder complex is composed of ;

- . Clavicle
- . Scapula
- . Humerus

The first three joints GH, AC and SC links the upper extremity to the axial skeleton at the thorax ST allow the scapula to glide over the posterior thoracic wall.

All the four joints work together for the normal movements of the shoulder.

(B) What makes shoulder joint most mobile?

Ans No 2(B): [Mobility of shoulder joint:](#)

Shoulder joint is the most mobile joint of the body due to the following reasons.

- (a) Shoulder joint is a ball and socket joint which makes it most mobile.
- (b) Shoulder joint consist of bony surfaces the shallow glenoid cavity and large humeral head.
- (c) Head of humerus is larger than surface hear of glenoid fossa.

(C) How normal position of scapula and Humerus aid in stability of shoulder joint?

Ans No 2 (C):

The scapula and humerus are the two bones which are involve in the stability of the shoulder joint.

If the scapula will not move then no movement will occur at the shoulder joint. so, it is very important for stability of shoulder joint.

On the other hand humerus has ligaments that forms joint capsule and gives stability to the shoulder joint.

(D) What is osteo and Arthrokinematics? Explain it with example

Ans No 2 (D):

[Osteo-kinematics:](#)

Osteo – derived from Greek word "Osteon" which means "bone".

Kinematics – derived from Greek word "kinesis" which means "movement or motion".

So, osteo-kinematics is the movement of bone.

Definition: It is the gross movement that occurs between two bones.

Example: Flexion / Extension

Abduction / Adduction.

[Arthrokinematics:](#)

Arthro – derived from Greek word "Arthron" which means "joint".

So, Arthrokinematics is the movement of joints.

Definition: The small movement that happens at the joint surface.

Example: Gliding, sliding, rolling and spinning.

Q3: (A) How supraspinatus muscle different from other SITS muscle in GH stabilization?

Ans No 3 (A):

Anterior stability of the shoulder.

Subscapular.

Internal rotator of the shoulder.

Abduct and externally rotates the arm important for the initial 0 to 15 degree of the shoulder abduction motion. when the arm is abducted side of the trunk.

Beyond 15 degree of the abduction, the deltoid movement arm acts synergistically to assist in the shoulder/arm abduction.

(B) Explain how scapula movement is necessary for normal range of motion of shoulder Joint?

Ans No 3 (B):

The scapula on the thorax contributes to elevation of humerus by upwardly the rotation glenoid fossa 50 to 60 degree from its resting position.

In normal upper quarter function< the scapula provides a stable base from which glenohumeral mobility occurs.

The scapular muscles must dynamically position the glenoid so that efficient glenohumeral movement can occur.