

## Final-Term Assignment

Course Title: Biomechanics And Ergonomics I

DPT 2<sup>nd</sup> semester section B

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Marks: 50

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### Note:

- Attempt all questions, all questions carry equal marks.
- Answer Briefly and to the point, avoid un-necessary details

Q1: (A) What is Humeroulnar Joint? Explain different movements at HU joint.

And) **HUMEROULNAR JOINT:**

The humeroulnar joint is a component of the elbow-joint. it's composed of two bones, the humerus and ulna, and is that the junction between the trochlear notch of ulna and therefore the trochlea of humerus.is classified as a straightforward hinge-joint, which allows for movements of flexion, extension and circumduction.

**MOVEMENT AT HU:**

HU allows the movements of flexion, extension and circumduction

\*During flexion, however, the forearm and also the hand tend to approach the center line of the body, and thus enable the hand to be easily carried to the face.

\*Extension within the humeroulnar joint is produced by the triceps and anconeus muscle, with a small contribution from the muscles arising from the epicondyle of the humerus, like the extensor digitorum muscle.

\*Circumduction could be a combination of flexion, extension, adduction and abduction. ... for instance, circumduction occurs when spinning the arm when performing a serve in tennis or bowling a ball.

(B) What is Humeroradial joint? Explain different movements at this joint.

Ans) **HUMERORADIAL JOINT:**

The humeroradial joint is that the joint between the top of the radius and therefore the capitulum of the humerus, may be a limited ball-and-socket joint, hinge form of articulation.

**MOVEMENTS AT HUMERORADIAL JOINT:**

It is classified as an easy hinge-joint, which allows for movements of flexion, extension and circumduction. Owing to the obliquity of the trochlea of the humerus, this movement doesn't happen within the antero-posterior plane of the body of the humerus.

(C) What is carrying angle? Why it is important.

Ans) **CARRYING ANGLE:**

Carrying angle is a small degree of cubitus valgus, formed between the axis of a radially deviated forearm and the axis of the humerus. It helps the arms to swing without hitting the hips while walking.

**IMPORTANCE:**

The carrying angle is bigger in throwing athletes. ... This angle permits the forearm to clear the hips in swinging movements during walking, and is vital when carrying objects.

**Q2:** (A) What is Wrist complex? Explain joints, contribution and ROM of wrist complex?

And) **WRIST COMPLEX:**

The wrist may be a complex joint that bridges the hand to the forearm. it's actually a set of multiple bones and joints. The bones comprising the wrist include the distal ends of the radius and ulna, 8 carpal bones, and therefore the proximal portions of the 5 metacarpal bones.

**JOINTS:** wrist is an ellipsoidal (condyloid) type articulation synovialis, allowing movement along two axes. this suggests that flexion,

extension, adduction and abduction can all occur at the wrist .

**CONTRIBUTION:**The wrist also mentioned because the wrist may be a condyloid articulation synovialis of the distal upper limb that connects and is a transition point between the forearm and hand. A condyloid joint may be a modified ball and socket joint that permits for flexion, extension, abduction, and adduction movements.

**ROM:**Movement at both the radiocarpal and midcarpal joints is important to realize the complete range of motion (ROM) of the wrist. Normal Range of Motion Reference Values

Typical Range of Motion

Elbow      Extension/Flexion      0/145

Forearm    Pronation/Supination    70/85

Wrist Extension/Flexion      70/75

Radial\Ulnar      20/35

(B) What is carpal Tunnel syndrome?

Ans) **CARPAL TUNNEL SYNDROME:**

Carpal passage disorder is brought about by pressure on the middle nerve. The carpal passage could likewise be a restricted path encircled by bones and tendons on the palm side of your hand. At the point when the middle nerve is compacted, the side effects can incorporate deadness, shivering and shortcoming inside the hand and arm.

**Q3: (A) Write down definitions of Muscle Twitch, Summation and refractory period?**

Ans) **MUSCLE TWITCH:**

Muscle jerking is furthermore called muscle fasciculation. Jerking includes little muscle withdrawals inside the body. Your muscles are produced using filaments that your nerves control. Incitement or harm to a nerve may make your muscle strands jerk. Most muscle jerks go unnoticed and are not cause for concern.

### SUMMATION:

The mix of powers created by various pieces of the physical body . . . In principle, power summation happens when all body parts act all the while practically speaking, the most grounded and least body parts round the focal point of gravity (for example trunk and thighs) move first, trailed by the more fragile, lighter, and quicker limits.

**REFRACTORY PERIOD:**hard-headed period might be a time of your time during which an organ or cell is unequipped for rehashing a particular activity, or (all the more correctly) the amount of your time it takes for a sensitive film to be prepared for a second boost once it comes back to its resting state following an excitation.

(B) Explain Types of Muscle contraction with example in your own words?

Ans) **MUSCLE CONTRACTION:**

There are three sorts of muscle contraction: concentric, isometric, and eccentric. Labeling eccentric contraction as “contraction” could also be a touch misleading, since the length of the sarcomere increases during this sort of contraction.

### TYPES OF MUSCLE CONTRACTION:

Isometric: A strong compression wherein the length of the muscle doesn't change.

isotonic: A strong compression wherein the length of the muscle changes.

whimsical: An isotonic constriction where the muscle stretches.

concentric: An isotonic withdrawal where the muscle abbreviates.

The sliding fiber hypothesis is the clarification for how muscles agreement to deliver power. the actin and myosin fibers inside the sarcomeres of muscle strands tie to make cross-extensions and slide past each other, making a compression.

(C) In Grade III muscle strain why we can't feel pain?

Ans) We can't feel pain in grade3 muscle strain because we need

sensory receptors to feel the pain and on this stage sensory receptors does not work. There is a pain but its not permanent pain is temporary it gets normal very fast.

Q4: (A) What is difference between cranial and spinal nerve? How ventral and dorsal ramus form from ventral and dorsal root?

Ans) **DIFFERENCE BETWEEN CRANIAL AND SPINAL NERVE:**

Cranial nerves are the nerves that rise straightforwardly from the cerebrum (counting the brainstem). Conversely, spinal nerves rise up out of fragments of the medulla spinalis . In humans 12 pairs, the cranial nerves, are attached to the brain, and, as a rule, 31 pairs, the spinal nerves, are attached to the spinal cord.

**VENTRAL AND DORSAL RAMUS FROM VENTRAL AND DORSAL ROOT:**

Not long after a nervus spinalis structures from the dorsal and ventral underlying foundations of the medulla spinalis it branches into the dorsal ramus and ventral ramus. Spinal nerves are blended nerves that convey both tangible and engine data.

(B) What is difference between Neuropraxia, Axonotmesis and Neurotmesis?

Ans ) **DIFFERENCE BETWEEN NEUROPRAXIA AND AXONOTMESIS AND NEUROTMESSIS :**

**NEUROPRAXIA:** neuropraxia is a type of peripheral nerve injury and is known as the mildest form of nerve injury. It is classified as a transient conduction block of motor or sensory function without nerve degeneration although loss of motor function is the most common finding.

**AXONOTMESIS:**

axonotmesis Is the moderate nerve injury caused by axon damage with intact endoneurium ,perineurium And epineurium .

**NEUROTMESSIS:**

third degree injury neurotmesis is the most severe grade of peripheral nerve injury . It occurs when the axon ,myelin, endoneurial tubes and connective tissues components are damaged ,disrupted and transected.

Q5: (A) What is Wolf's Law?

Ans ) **WOLF'S LAW:**

Wolff's Law expresses that bone develops and rebuilds in light of the powers that are put upon it in a sound individual. After a physical issue to a bone, setting explicit worry in explicit ways deep down can assist it with renovating and get ordinary, solid bone once more.

Each adjustment in the structure and the capacity of a bone or in the capacity of bone alone, prompts changes in its inside design and in its outer structure. bone structure thinks about pressure put it.

(B) How fracture repair? Explain different stages of fracture repair?

**FRACTURE REPAIR:**

Bone crack fix may be a procedure to repair a wrecked bone utilizing metal screws, pins, bars, or plates to carry the bone found out . It's otherwise called open decrease and inner obsession (ORIF) procedure .

STAGES OF FRACTURE REPAIR :

\*Hematoma formation

\*fibro cartilaginous callus formation

\*bony callus formation

\*Bone remodeling

There are four phases in the fix of a messed up bone:

- 1) the arrangement of hematoma at the break
- , 2) the development of a fibrocartilaginous callus
- , 3) the development of a hard callus,
- 4) renovating and expansion of minimal bone.