**Final-Term Assignment**

**Course Title: Biomechanics And Ergonomics I**

**DPT 2nd semester section B**

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

**Answer:**

**Definition :**

This joint composed two bone humerus and ulna , and

Humerounlar joint is formed between trochlear notch of

Ulna and trochlea of humerus . It is simple hinge joint

**Movement :**

**Flexion :**

During flexion , movement of forearm to shoulder, and the bending of elbow which decrease its angle

**Extension :**

During extension , movement of forearm away from shoulder , by straighten the elbow and increase of angle occur

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

**Answer**

**Definition :**

This joint is the part of elbow joint which is formed Humerus ( capitulum) and radius ( fovea)

**Movement :**

**With** pronation and supination of forearm radial head spin

on capitulum

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

**Answer :**

**Carrying angle :**

**Definition :**

The angle which formed , when our forearm and.

Hand should be about 5 to 15 degree away from our body

this is called carrying angle .

**Definition :**

The angle formed between longitude axis of arm and

Forearm .

**Average :**

Female : 13.6

Male : 6.7

**Important :**

* The carrying angle is very useful help to prevent the elbow from displacement and fracture
* Due to carrying angle ,chances of epicondylar disease at elbow is less
* It also help for surgical planning. For elbow reconstruction
* The value of carrying angle is increase progressively from childhood up to teenage (16)
* This angle also help during walking , swimming ,and carrying objects.

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

**Answer:**

**Wrist complex**

The wrist complex is also called ( radiocarpal joint ) it is a synovial joint it make a connection or transition area between forearm and hand . the joint at proximal of wrist joint increase the degree of freedom at the hand .

**Distally :**

It is formed by proximal row of carpal bone

**Proximal**

It is formed by distal end of radius .

* **Joints:**
* Midcarpal joint composed , scaphoid, lunate ,triquetrum, trapezium, trapezoid, capitate and Hamate.
* The radiocarpal joint is composed radius and radiounlar disk with scaphiod, lunate , triqurtem.

**Contribution of wrist complex :**

1. The muscle of wrist complex are help in balance and control of wrist joint
2. It can help in length tension relationship of articular muscle of hand ,also prevent the wrist from replacement .
3. Allow fine adjustment of grip

**Rang of motion**

Extension \_65 to 85

Flexion \_ 60 to 85

Ulnar deviation \_20 to 45

Radial deviation\_ 15 to 25

Supination , pronation may for radio carpal joint.

(B) What is carpal Tunnel syndrome?

**Answer :**

**Definition**

Any thing , disease, that compress , irrated, or squeeze the

Medina never in carpal tunnel cause the carpal tunnel

Syndrome.

* Carpal tunnel syndrome cause pain , numbness , and tingling in the hand and arm
* Transverse carpal ligament is the most site of wrist Flexation cased median never compress .

**Q3:** (A) Write down definitions of Muscle Twitch, summation and Refractory period.

**Answer**

**Muscle twitch :**

**Definition :**

The muscle twitch is also called muscle fasciculation

It is condition in which involuntary contraction of fibres

Occur which make our muscle

* Something that stimulate or damage never it cause the muscle fiber contraction cause muscle twitch

**Cause :**

Mostly cause by harmless through more serious

**Summation:**

**Definition**

* It occur susseive stimuli are added together to produce muscle contraction.
* When mechanical response to successive stimuli are added to initial response the result is know as summation

**Refractory period :**

**Definition**

* A period during which never and muscle are incapable of responding to stimulation .
* During refractory period the nerous cannot be excited to generate second action.
* Refractory period is important because it allow us adjust briefly to a stimulus and the limit the amount of action sent per minutes.

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

**Answer:**

We have following type of muscle

**Isometric** :

* Isometric contraction mean same in length
* The type of muscle contraction in which length of muscle cannot

Change,

* No movement can produce.

**Example :**

When we carry object the weight of object would pulling downward but our arm and hand would opposing the motion with equal force going upward our arm are neither ’raising or lowering but bicep isometric ally contract.

**Isotonic :**

* Isotonic mean tension
* The type of muscle contraction in which length of muscle can change.

**Example :**

* Bicep curl
* Pushup
* Stairs climbing

**Concentric**

* An isotonic contraction where muscle shorten

**Example**

During bicep cruel the bicep contract contractally during lifting phase of exercise.

**Eccentric**

An isotonic contraction in which the muscle length .

**Example**

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

**Answer :**

**Reason :**

We cannot feel pain in Grand three muscle , because when serious injury occur at Grade so the sensory never and tissue at that area is also Damage , which has itself has no ability to create pain , and never are unable to carry single to brain that’s why we cannot feel the pain in injury of Grade 3.

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

**Answer**

**Cranial never:**

These never Arise from brain and passed in separate apparatus in skull .

* 12 pair of never
* Number from I to ixx

**Spinal never**

These arise from root of spinal to both side

* 31 pair in number
* It composed
* 8 cervical
* 12 thoracic
* 5 lumbric
* 1 coccyx

Composed of sensory and motor neuron

**Formation of ventral and dorsal ramus**:

Dorsal has ganglion this afferent sensory root and carry sensory information

Ventral is efferent root and carry information to brain

.

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

Answer

**Neuropraxia**

* It is type of peripheral never. Injury and it is know. Mildest never injury
* It is recovered rapidly
* Complete motor loss

**Axonotmessis**

* It is term when axon is DA mag but tissue Remain intact
* Complete motor loss
* It recovery 1mm per day

**Neurotamesis**

* **The stag** in which both axon and connective tissue DA mag
* Complete motor loss
* Recovery 1 mm per day

Q5: (A) What is Wolf’s Law?

**Answer:**

**Statement 1**

* This law states that our bone adapt based on stress or demand on them when we work on our muscle they put stress on our bone. In the response our tissue remold and become strong .

**Statement 2**

* This Law states the bone grows and remolded in the response to the force that are placed upon it in a healthy person. And after injury it help to remodel and become Healthy bone again .

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

**Answer**

**Bone fracture :**

Bone fracture occur when a force exerted against a bone is stronger than bone can bear .

**Repair fracture stages**

**Hematoma**

* The blood vessel supply blood to bone is rapture which cause hematoma at fracture side and cause a temporary frame for healing .

**Fibrocaltagenous callus**

* Granulation tissue is formed as hematoma is the infiltrated by call I per and macrophage which gain to clean up the debris
* Some fibroblast produce collagen fiber that span the break while other differate into chondroblast and begin secreting carriage matrix osteoblast begin forming spongy bone called fibrocartilage .

**Bony callus formation :**

Bone trabeculae increase number and convert callus into

Cartilaginous.

**Bone remolding :**.

During next several month bony callus convert into a bone its original shape .