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**Question 1:-**

**Part A:-**

**Definition:-**

 The humeroulnar joint is the part of the elbow joint where the trochlea of the humerus is received into the semilunar notch of the ulna.

**Motion Degree:-**

The elbow complex includes the elbow joint (humeroulnar and humeroradial joints) and the proximal and distal radioulnar joints. The two joints acting together produce rotation of the forearm and have 1 degree of freedom of motion.

**Action:-**

It is composed of two bones, the humerus and ulna, and is the junction between the trochlear notch of ulna and the trochlea of humerus. It is classified as a simple hinge-joint, which allows for movements of flexion, extension and circumduction.

**Different Movements Of HU Joints:-**

The humeroulnar joint, is part of the elbow-joint or the Olecron Joint, between the ulna and humerus bones is the simple hinge-joint, which allows for movements of flexion, extension and circumduction. The Humero-Ulnar Joint is the junction of trochlear notch of the ulna and the trochlea of the humerus. Owing to the obliquity of the trochlea of the humerus, this movement does not take place in the antero-posterior plane of the body of the humerus. When the forearm is extended and supinated, the axis of the arm and forearm are not in the same line; the arm forms an obtuse angle with the forearm. During flexion, however, the forearm and the hand tend to approach the middle line of the body, and thus enable the hand to be easily carried to the face. The accurate adaptation of the trochlea of the humerus, with its prominences and depressions, to the semilunar notch of the ulna, prevents any lateral movement. Flexion is produced by the action of the Biceps brachii and Brachialis, assisted by the Brachioradialis, with a tiny contribution from the muscles arising from the medial epicondyle of the humerus. Extension is produced by the Triceps brachii and AnconC&us, with a tiny contribution from the muscles arising from the lateral epicondyle of the humerus, such as the Extensor digitorum communis.

**Part B:-**

**Definition:-**

The humeroradial joint is the joint between the head of the radius and the capitulum of the humerus, is a limited ball-and-socket joint, hinge type of synovial joint.

**Movements:-**

The two joints linking these bones the humeroulnar and humeroradial joints are hinge joints and are capable of flexion and extension of the elbow.

Flexion involves the movement of the hand and forearm toward the shoulder via rotation around the joint.

**Part C:-**

**Definition:-**

The carrying angel is defined as the angel between longitudinal axis of arm and forearm or longitudinal axis of the humerus and ulna. Simply it is the long axis angel between humerus and ulna.

**Importance:-**

* The carrying angel value increases progressively from childhood until 16 years when stabilization noticed.
* Useful in management in elbow displacement and fractures.
* Epicondylar disease.
* Surgical planning for elbow reconstruction.
* Walking, swinging and carrying objects.

**Question 2:-**

**Part A:-**

**Werst Complex:-**

 The major contribution of wrist complex is to control length tension relationship in multiarticular hand muscles & to allow fine adjustments of grip,

The wrist angle is consist of the compound joints.

1. Radiocarpal joints

2. Midcarpal joints.

They are referred collectivelty as the wrest angle.

The werst angle has been called the most complex joint both physiologic and anatomic prespective.

As a whole the wrist angle is considered as biaxial with motion of extenstion around a cornal axis.

Radial deviation around a anterposterior axis .

Normal ranges.

Extension 60 to 85.

Wrist flexion 65 to 85.

Radial deviation 15 to 21.

Ulnar deviation 10 to 45.

**1**.**Radio Carpal Joint;-**

Formed by the radio and radio ulnar disk as a part of the triangular fibrocartilage complex and by the scaphoid,lunate,and triquetri distally.

**2. Mid carpal Joint:-**

The mid carpal joint lie between the two rows of carpels.

A compound articulation because of the each row has both comcave and conver segement.

The proximal row of the carpel is conver locterally and the concave medially.

The scaphoid,lunate,trapezium trapezoid,and triquetrum present with concave surface of the dorsal row of carpels.

**Part B:-**

**Intro:**

- carpus is derived from a Greek word "karpose " which means "wrist "

- the wrist is surrounded by a band of fibrous tissue that normally functions is to support for the joint

- it is the most common upper extremity compression neuropathy

**Def:**

When the median nerve becomes compressed with in the carpal tunnel a neuropathy known as carpal tunnel syndrome

**Symptoms:**

- numbness or tingling in the thumb and next two or three figures of one or both hands

- Numbness and tingling of the palm

- pain in elbow

- pain in wrest

- weakness in one or both hands

**Causes:**

Usually causes is unknown

- pressure on nerve can happen in several ways

- joint dislocation

- Fracture

- posture ' keeping the wrist bent for long time

- osteoarthritis can narrow the tunnel.

**Question 3:-**

**Part A:-**

**Muscle Twitching:-**

Muscle twitching is also called muscle fasciculation. Twitching involves small muscle contractions in the body. Your muscles are made up of fibers that your nerves control. Stimulation or damage to a nerve may cause your muscle fibers to twitch. Most muscle twitches go unnoticed and aren't cause for concern.

**Summation:-**

Summation in physiology, the additive effect of several electrical impulses on a neuromuscular junction, the junction between a nerve cell and a muscle cell. Individually the stimuli cannot evoke a response, but collectively they can generate a response.

**Refractory Period:-**

A period immediately following stimulation during which a nerve or muscle is unresponsive to further stimulation.

The refractory period is important because it allows us to adjust briefly to a stimulus and limits the amount of action potentials sent per minute.

**Part B:-**

**Muscle Contraction:-**

Muscle contraction is the activation of tension-generating sites within muscle fibers. In physiology, muscle contraction does not necessarily mean muscle shortening because muscle tension can be produced without changes in muscle length, such as when holding a heavy book or a dumbbell at the same position.

**Types of muscle contraction:-**

There are two main types of muscle contraction:

**1.Isotonic contractions:–** these occur when a muscle contracts and changes length and there are two types:

**Isotonic concentric contraction:–** this involves the muscle shortening. The origin and insertion of the muscle move closer together and the muscle becomes fatter.

**Isotonic eccentric contraction:–** this involves the muscle lengthening whilst it is under tension. The origin and the insertion move further away from each other. An eccentric contraction provides the control of a movement on the downward phase and it works to resist the force of gravity.

**2. Isometric contraction:–** this involves a muscle producing tension but staying the same length. This occurs when the body is fixed in one position.

Here, the muscles are contracting isometrically to hold this gymnast in the crucifix position and are not changing length. When the isometric contractions end, isotonic contraction will occur.

**Part C:-**

Because there occure complete rupture of muscles and tendons or the muscles can separate from each other complete loss of functioning.

**Question 4:-**

**Part A:-**

**Cranial Nerves:-**

Cranial nerves are the nerves that arise from the brain and pass to separate apertures in the skull.

Comprise 12 nerves pairs.

Numbered 1 to 12.

Distributed in the head,neck,and facial regions.

 May contains sensory/motor/mixed neurons.

From dorsal and ventral roots.

**Spinal nerves:-**

Spinal nerves are a series of paired nerves that originate from the nerve root of the spinal cord on both sides.

Comprise 31 nerve pairs.

Classified into 5 groups.

Distributed in the skin,sweat,gland,mucosa,blood vessels, joints, and skeletal muscle

Composed of both sensory and motor nerve.

Involved in movement,sensation,and sweat secreation.

Do not form and ventral roots.

**Part B:-**

**Neurotmesis:-**

Neurotmesis is the most severe grade of peripheral nerve injury. It occurs when the axon, myelin, endoneurial tubes, and connective tissue components are damaged, disrupted, and/or transected, despite the preservation of the perineurium.

**Axonotmesis:-**

Axonotmesis is a moderate nerve injury caused by axon damage with intact endoneurium, perineurium, and epineurium.

**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.

**Question 5:-**

**Wolf Law:-**

Our skeleton are constantly changing. Every time is applied to our bones,they remodel themselves to adapt to stress.for example the bone in a tennis player,s dominant arm may be upto 20%thicker than the bone in their non donminant arm. This effect is also called wolff,s law. It state that our bone become thicker and stronger over time to resist forces placed upon them and thinner and weaker if there are no forces to act against.

**B.**

**Bone fracture repair.**

While some bones can heal by weraing a cast'other may requir invasive treatment such as bone fracture repair. Bone fracture repair is a surgery to fix bone using metal screws pins to hold the bone in place**.**

**Stages.**

There are four stages in the repair of a broken bone: 1) the formation of hematoma at the break, 2) the formation of a fibrocartilaginous callus, 3) the formation of a bony callus, and 4) remodeling and addition of compact bone**.**