



IQRA NATIONAL UNIVERSITY

DEPARTMENT OF ALLIED HEALTH SCIENCES

Mid-Term Examination (Summer 2020) (BS DT 1st, BS MLT 1st, BS RAD 1st)

Course Title: Human Anatomy-I

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Time: 4 hours id number I'd number 16463 name sami ul haq radiology section b

Note:

- Attempt all questions from this section, all questions carry equal marks.
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Q1. Define the following terms:

A) Motor unit

Ans Motor unit:

The motor unit is the functional unit of muscle contraction and includes the motor nerve fiber and the muscle fibers it innervates.

On the same side, as opposed to contralateral. For example, a tumor involving the right side of the brain may affect vision ipsilaterally that is, in the right eye.

B) Ipsilateral

Ans on the same side as opposed to contralateral for example a tumour involving the right side of the brain may effect vision ipsilateral that is in the right eye

C) Supination

Supination: rotation of the forearm and hand so that the palm faces forward or upward also : a corresponding movement of the foot and leg in which the foot rolls outward with an elevated arch.

Axial skeleton:

The axial skeleton is the part of the skeleton that consists of the bones of the head and trunk of a vertebrate. In the human skeleton, it consists of 74 bones and is composed of six parts; the skull (22 bones), the ossicles of the middle ear, the hyoid bone, the rib cage, sternum and the vertebral column.

D) Arteriosclerosis

E) Hardening and thickening of the walls of the arteries. Arteriosclerosis can occur because of fatty

deposits on the inner lining of arteries (atherosclerosis),

F) Shunt

shunt is a hole or a small passage which moves, or allows movement of, fluid from one part of the body to another.

Q2. Differentiate between type 1 and type 2 muscle fibers.

Ans Slow-twitch Fibers:

Exercises that feature sustained isometric contractions with little-to-no joint movement keep the slow-twitch muscle fibers under contraction for an extended period of time. This can help improve their ability to utilize oxygen to produce energy. Examples include the front plank, the side plank and the single-leg balance.

Resistance-training exercises using lighter weights with slower movement tempos for higher numbers of repetitions (i.e., more than 15) can engage the slow-twitch fibers to use aerobic metabolism to fuel the activity.

Circuit training, which involves alternating from one exercise to the next with little-to-no rest while using lighter weights, can be an effective way to challenge slow-twitch fibers.

Body-weight exercises for higher numbers of repetitions can be an effective way to challenge aerobic metabolism, which helps improve the efficiency of slow-twitch fibers.

When working with body-weight only or lighter amounts of resistance, use shorter rest intervals of approximately 30 seconds between sets to challenge the slow-twitch fibers to use aerobic metabolism to fuel the workout.

: Type II, Muscle Fibers:

Fast-twitch fibers can be further classified into (1) fast-twitch IIa - fast oxidative glycolytic, because they use oxygen to help convert glycogen to ATP, and (2) fast-twitch type IIb - fast glycolytic, which rely on ATP stored in the muscle cell to generate energy.

Fast-twitch fibers have a high threshold and will be recruited or activated only when the force demands are greater than the slow-twitch fibers can meet.

The larger fast-twitch fibers take a shorter time to reach peak force and can generate higher amounts of force than slow-twitch fibers.

Fast-twitch fibers can generate more force, but are quicker to fatigue when compared to slow-twitch fibers.

The phasic muscles responsible for generating movement in the body contain a higher density of fast-twitch fibers.

Strength and power training can increase the number of fast-twitch muscle fibers recruited for a specific movement.

Fast-twitch fibers are responsible for the size and definition of a particular muscle.

Q3. Classify the bones according to their shape.

Ans 3 Classifications of Bones

Bones are classified according to their shape.

Long Bones

A long bone is one that is cylindrical in shape, being longer than it is wide. Keep in mind, however, that the term describes the shape of a bone, not its size. Long bones are found in the arms (humerus, ulna, radius) and legs (femur, tibia, fibula), as well as in the fingers (metacarpals, phalanges) and toes (metatarsals, phalanges). Long bones function as levers; they move when muscles contract.

Short Bones

A short bone is one that is cube-like in shape, being approximately equal in length, width, and thickness. The only short bones in the human skeleton are in the carpals of the wrists and the tarsals of the ankles. Short bones provide stability and support as well as some limited motion.

Flat Bones

The term "flat bone" is somewhat of a misnomer because, although a flat bone is typically thin, it is also often curved. Examples include the cranial (skull) bones, the scapulae (shoulder blades), the sternum (breastbone), and the ribs. Flat bones serve as points of attachment for muscles and often protect internal organs.

Irregular Bones

An irregular bone is one that does not have any easily characterized shape and therefore does not fit any other classification. These bones tend to have more complex shapes, like the vertebrae that support the spinal cord and protect it from compressive forces. Many facial bones, particularly the ones containing sinuses, are classified as irregular bones.

Sesamoid Bones

A sesamoid bone is a small, round bone that, as the name suggests, is shaped like a sesame seed. These bones form in tendons (the sheaths of tissue that connect bones to muscles) where a great deal of pressure is generated in a joint. The sesamoid bones protect tendons by helping them overcome compressive forces. Sesamoid bones vary in number and placement from person to person but are typically found in tendons associated with the feet, hands, and knees.

Q4. What is the difference between artery, vein and capillary?

Ans : ARTERIES:

1) These blood vessels have thick walls and carry blood from the heart to different body parts. They do not have valves.

.) All the arteries carry oxygenated blood except the pulmonary artery.

: VEINS:

1) These blood vessels have thin walls and carry blood from different body parts to the heart.

2) They have valves and prevent backflow of blood.

3) All the veins carry deoxygenated blood except the pulmonary vein.

: CAPILLARIES:

1) These blood vessels are narrow and have very thin walls, they connect arteries and veins.

2) They do not have valves.

3) As it connects arteries and veins, therefore, it contains both oxygenated and deoxygenated blood.

Q5. What do you know about the mechanism of skeletal muscle contraction?

Ans Ans.5:

Mechanism of skeleton muscles contraction:

Muscle contraction occurs when the thin actin and thick myosin filaments slide past each other. It is generally assumed that this process is driven by cross-bridges which extend from the myosin filaments and cyclically interact with the actin filaments as ATP is hydrolysed. Current biochemical studies suggest that the myosin cross-bridge exists in two main conformations. In one conformation, which occurs in the absence of MgATP, the cross-bridge binds very tightly to actin and detaches very slowly. When all the cross-bridges are bound in this way, the muscle is in rigor and extremely resistant to stretch. The second conformation is induced by the binding of MgATP. In this conformation the cross-bridge binds weakly to actin and attaches and detaches so rapidly that it can slip from actin site to actin site, offering very little resistance to stretch. During ATP hydrolysis by isolated actin and myosin in solution, the cross-bridge cycles back and forth between the weak-binding and strong-binding conformations.

Q6. What is the anatomical position of scapula and clavicle in human body?

Ans Ans 6:

Anatomical position Of Scapula:

the scapula also known as the shoulder bone, shoulder blade, wing bone or blade bone, is the bone that connects the humerus (upper arm bone) with the clavicle (collar bone). Like their connected bones, the scapulae are paired, with each scapula on either side of the body being roughly a mirror image of the other.

Anatomical position of Clavicle:

The clavicle, or collarbone, is a long bone that serves as a strut between the shoulder blade and the sternum (breastbone). There are two clavicles, one on the left and one on the right. The clavicle is the only long bone in the body that lies horizontally. Together with the shoulder blade, it makes up the shoulder girdle. It is a touchable bone, and in people who have less fat in this region, the location of the bone is clearly visible, as it

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creates a bulge in the skin. The clavicle is the most commonly fractured bone. It can easily be fractured due to impacts to the shoulder from the force of falling on outstretched arms or by a direct hit.