**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-l Instructor: Ms. Maria Feroze**

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**Note:**

* **Attempt all questions from this section, all questions carry equal marks.**

Q1. Define the following terms:

1. Motor unit.
2. Ipsilateral
3. Supination
4. Axial skeleton
5. Arteriosclerosis
6. Shunt

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

Q3 Classify the bones According to there shapes?

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

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

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

**Q1**.(A)The motor unit is the functional unit of muscle contraction and includes the motor nerve fiber and the muscle fibers it innervates.

(B) 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.

C 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.

(D) 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.

(E) Arteriosclerosis is the thickening, hardening, and loss of elasticity of the walls of arteries.

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

**Q2.** The key difference between type 1 and type 2 muscle fibers is that the type 1 muscle fibers contract slowly while the type 2 muscle fibers contract rapidly. Moreover, type 1 muscle fibers depend on aerobic respiration while type 2 muscle fibers depend on anaerobic respiration.

There are three major types of muscles. Among them, skeletal muscle is one type, which is attached to the skeleton. The individual muscle fibers make up the skeletal muscle. There are two main types of muscle fibers namely type 1 and type 2 muscle fibers. They are also known as slow-twitch and fast-twitch muscle fibers respectively

Type 1 muscle fibers are one type of muscle fibers in the skeletal muscle. Moreover, they are also known as slow-twitch fibers due to their slow contraction. They are rich in mitochondria and also contain more myoglobin. Therefore, these fibers are more efficient in using oxygen to produce ATP continuously over a long time.

**Difference Between Type 1 and Type 2 Muscle Fibers**

Hence, they are the muscles that help us in distance running or marathons, since they can resist fatigue for a long time. Type 1 muscle fibers are red in colour due to the presence of high content of myoglobin, oxygen, and mitochondria.

 2nd type Muscle Fibers

Type 2 muscle fibers are the second major type of muscle fibers in the skeletal muscle. They are also known as fast-twitch fibers. There are two types namely type 2a and type 2b. Furthermore, these fibers use anaerobic respiration to produce fuel. Type 2a fibers are known as intermediate fast-twitch fibers or fast oxidative fibers and they are a combination of type 1 and type 2 muscle fibers. On the other hand, type 2a fibers use both aerobic and anaerobic metabolisms. Type 2b fibers use only anaerobic metabolisms and they are known as fast glycolytic fibers. Both of these types are rapid firing.

 the Similarities Between Type 1 and Type 2 Muscle Fibers?

Both Type 1 and Type 2 muscle fibers are muscle fibers of the skeletal muscle.

Type 1 and Type 2 Muscle fibers contain myoglobin.

Both Type 1 and Type 2 Muscle fibers can contract.

These fibers produce ATP.

Type 1 and Type 2 Muscle Fibers possess many capillaries and mitochondria.

**Q3.** **Classify bones according to their shapes**

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. The patellae (singular = patella) are the only sesamoid bones found in common with every person.

**Q4** Arteries carry blood away from the heart; the main artery is the aorta. ... Capillaries carry blood away from the body and exchange nutrients, waste, and oxygen with tissues at the cellular level. Veins are blood vessels that bring blood back to the heart and drain blood from organs and limbs.

 **ARTERIES VEINS CAPILLARIES**

1) These blood vessels have thick walls and carry blood from the heart to different body parts. 1) These blood vessels have thin walls and carry blood from different body parts to the heart. 1) These blood vessels are narrow and have very thin walls, they connect arteries and veins.

2) They do not have valves. 2) They have valves and prevent backflow of blood. 2) They do not have valves.

3) All the arteries carry oxygenated blood except the pulmonary artery. 3) All the veins carry deoxygenated blood except the pulmonary vein. 3) As it connects arteries and veins, therefore, it contains both oxygenated and deoxygenated blood.

**Q5.** 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.

**Q6** The clavicle (collarbone) is an S-shaped bone located on the anterior side of the shoulder. It is attached on its medial end to the sternum of the thoracic cage, which is part of the axial skeleton. The lateral end of the clavicle articulates (joins) with the scapula just above the shoulder joint.

The scapula, also known as the shoulder blade, is a flat triangular bone located at the back of the trunk and resides over the posterior surface of ribs two to seven.

THE END…