**IQRA NATIONAL UNIVERSITY**

**DEPARTMENT OF ALLIED HEALTH SCIENCES**

**Final-Term Examination(Summer-20) (BS. Dental, Rad, MLT)**

**Course Title: Human Anatomy-l Instructor: Ms. Maria Feroze**

**Time: 4 hours Max Marks: 50**

**Note:**

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

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Q1: Explain the mechanism of breathing.

Breathing is the physical process of inhaling oxygen and exhaling carbon dioxide.

The mechanism of breathing involves two main processes: inspiration and expiration.

Inspiration occurs when the diaphragm and the external intercostal muscles contract.

Expiration occurs when the diaphragm and the intercostal muscles relax.

The contraction or relaxation of muscles around the lungs changes the entire volume of air inside the lungs, and so does the pressure.

If the pressure inside the lungs is more than the outside, the air rushes out. If the opposite happens, the air rushes in.

Due to the high elasticity of the lung tissue and low surface tension of moisture in the lungs, the lungs have higher compliance.

The processes of inspiration (breathing in) and expiration (breathing out) are vital for providing oxygen to tissues and removing carbon dioxide from the body. Inspiration occurs via active contraction of muscles – such as the diaphragm – whereas expiration tends to be passive, unless it is forced.

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Q 2: What do you know about the origin of diaphragm?

The diaphragm is an unpaired, dome shaped skeletal muscle that is located in the trunk. It separates the thoracic and abdominal cavities from each other by closing the inferior thoracic aperture. The diaphragm is the primary muscle that is active in inspiration. Contraction of the muscle facilitates expansion of the thoracic cavity. This increases volume of the the cavity, which in turn decreases the intrathoracic pressure allowing the lungs to expand and inspiration to occur.

The diaphragm is much more than just a sheath separating your thoracic and abdominal cavities. This article will examine this intricate and crucial muscle in detail, looking at its anatomy, function and structures which pass through it.

The diaphragm, also known as the thoracic diaphragm, is a large structure located at the bottom of the thoracic cavity that facilitates the breathing process. The thoracic cavity is your chest area where your heart and lungs are held. The diaphragm also serves as a divider between the thoracic and the abdominal cavities. The abdominal cavity is below the thoracic cavity. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q3: Classify the ribs according to their attachments to the sternum.

The bony ribs do not extend anteriorly completely around to the sternum. Instead, each rib ends in a costal cartilage. These cartilages are made of hyaline cartilage and can extend for several inches. Most ribs are then attached, either directly or indirectly, to the sternum via their costal cartilage . The ribs are classified into three groups based on their relationship to the sternum.

Ribs 1–7 are classified as true ribs (vertebrosternal ribs). The costal cartilage from each of these ribs attaches directly to the sternum. Ribs 8–12 are called false ribs (vertebrochondral ribs). The costal cartilages from these ribs do not attach directly to the sternum. For ribs 8–10, the costal cartilages are attached to the cartilage of the next higher rib. Thus, the cartilage of rib 10 attaches to the cartilage of rib 9, rib 9 then attaches to rib 8, and rib 8 is attached to rib 7. The last two false ribs (11–12) are also called floating ribs (vertebral ribs). These are short ribs that do not attach to the sternum at all. Instead, their small costal cartilages terminate within the musculature of the lateral abdominal wall.

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Q4: What do you know about the general features of first rib?

The first rib is the most curved and usually the shortest of all the ribs; it is broad and flat, its surfaces looking upward and downward, and its borders inward and outward.

The head is small, rounded, and possesses only a single articular facet, for articulation with the body of the first thoracic vertebra. The neck is narrow and rounded. The tubercle, thick and prominent, is placed on the outer border. There is no angle, but at the tubercle the rib is slightly bent, with the convexity upward, so that the head of the bone is directed downward. The upper surface of the body is marked by two shallow grooves, separated from each other by a slight ridge prolonged internally into a tubercle, the scalene tubercle, for the attachment of the Scalenus anterior; the anterior groove transmits the subclavian vein, the posterior the subclavian artery and the lowest trunk of the brachial plexus. Behind the posterior groove is a rough area for the attachment of the Scalenus medius. The under surface is smooth, and destitute of a costal groove. The outer borderis convex, thick, and rounded, and at its posterior part gives attachment to the first digitation of the Serratus anterior; the inner border is concave, thin, and sharp, and marked about its center by the scalene tubercle. The anterior extremity is larger and thicker than that of any of the other ribs.

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Q5: How is the mediastinum divided?

Anatomically, the mediastinum is divided into two parts by an imaginary line that runs from the sternal angle (the angle formed by the junction of the sternal body and manubrium) to the T4 vertebrae: Superior

The mediastinum (from Medieval Latin mediastinus, "midway “is the central compartment of the thoracic cavity surrounded by loose connective tissue, as an undelineated region that contains a group of structures within the thorax. The mediastinum contains the heart and its vessels, the esophagus, the trachea, the phrenic and cardiac nerves, the thoracic duct, the thymus and the lymph nodes of the central chest.

The mediastinum is an area found in the midline of the thoracic cavity, that is surrounded by the left and right pleural sacs. It is divided into the superior and inferior mediastinum, of which the latter is larger.

The inferior mediastinum is further divided into the anterior, middle and posterior mediastinum. Every compartment of the mediastinum contains many vital organs, vascular and neural structures that are closely related one to another.

Such a rich content of the mediastinum indicates its significance from the aspect of the anatomy.

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Q6: Briefly discuss the structure of lungs.

 The lungs are roughly cone shaped, with an apex, base, three surfaces and three borders. The left lung is slightly smaller than the right – this is due to the presence of the heart.

Each lung consists of:

Apex – The blunt superior end of the lung. It projects upwards, above the level of the 1st rib and into the floor of the neck.

Base – The inferior surface of the lung, which sits on the diaphragm.

Lobes (two or three) – These are separated by fissures within the lung.

Surfaces (three) – These correspond to the area of the thorax that they face. They are named costal, mediastinal and diaphragmatic.

Borders (three) – The edges of the lungs, named the anterior, inferior and posterior borders.

The lungs are a couple of light, air-filled organs situated on either side of the chest (thorax). The trachea (windpipe) conducts breathed in air into the lungs through its rounded branches, called bronchi. The bronchi at that point separate into littler and littler branches (bronchioles), at long last getting to be tiny.

Lobes

The right and left lungs do not have an identical lobular structure.

The right lung has three lobes; superior, middle and inferior. The lobes are divided from each other by two fissures:

Oblique fissure – Runs from the inferior border of the lung in a superoposterior direction, until it meets the posterior lung border.

Horizontal fissure– Runs horizontally from the sternum, at the level of the 4th rib, to meet the oblique fissure.

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*(Understanding The Question Paper Is Also Part Of Examinations)*