**Mid-Term Assignment**

**Course Title: Basic Physiology I**

**MLT 1st semester**

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 **I'd 16025 Marks: 30 Bs MLT**

 **First semester**

 **Section B**

**Note:**

* **Attempt all questions, all questions carry equal marks.**
* **Answer Briefly and to the point, avoid un-necessary details**

**Q1:** (A) What is respiratory system? Write down different organs of respiratory system and its functions as well.

Ans The respiratory system consists of all the organs involved in breathing. These include the nose, pharynx, larynx, trachea, bronchi and lungs. The respiratory system does two very important things: it brings oxygen into our bodies, which we need for our cells to live and function properly; and it helps us get rid of carbon dioxide, which is a waste product of cellular function. The nose, pharynx, larynx, trachea and bronchi all work like a system of pipes through which the air is funnelled down into our lungs. There, in very small air sacs called alveoli, oxygen is brought into the bloodstream and carbon dioxide is pushed from the blood out into the air. When something goes wrong with part of the respiratory system, such as an infection like pneumonia, it makes it harder for us to get the oxygen we need and to get rid of the waste product carbon dioxide. Common respiratory symptoms include breathlessness, cough, and chest pain.

(B) Respiratory system function

The primary function of the respiratory system is gas exchange. Animal cells use oxygen and produce carbon dioxide as a byproduct. Not only do animals need a way to get more oxygen into the cells, but they also need a way to remove carbon dioxide. The respiratory system provides this functionality



(2 ) What is cycle of breathing? Explain it in detail.

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Breathing Cycle

1)The Breathing Cycle is a description of the changes in pressure, lung volume, and airflow that occur during a single cycle of breathing. The major pressure gradient which controls expansion and contraction of the lung during the breathing cycle is that between the alveolar air and the intrapleural space; consequently, we will be focusing on this gradient. The breathing cycle can be divided into three basic stages including rest, inspiration, and expiration which are discussed separately below.

Rest

2)During rest there is no net movement of air into our out of the lungs and the lung volume is equivalent to the Functional Residual Capacity. Given that there is no net movement of air it is clear that the air pressure in the alveoli is equivalent to that of atmospheric pressure. However, the intrapleural pressure in a resting lung is roughly -5 cm H2O, that is five centimeters of water, below that of atmospheric pressure at rest. The negative intrapleural pressure is a result of the opposing forces of the lung and chest wall

3)As explained in Integrated Pulmonary Compliance, the lungs displays strong recoiling forces at FRC whereas the chest wall displays a tendency to spring outward. These opposing forces generate a negative pressure within the intrapleural space which is responsible for maintaining the lungs in an inflated state while at rest. If the negative intrapleural pressure were eliminated, say by raising it to that of atmospheric pressure as might occur in a pneumothorax, the lungs would collapse under their own recoiling force.

Inspiration

4)During inspiration there is a net movement of air into the lungs and the volume of the lungs expands by the tidal volume above that of the Functional Residual Capacity (FRC). Given the inward movement of air, it is clear that the alveolar pressure must be slightly negative, thus dipping below that of atmospheric pressure and in consequence actuating inward airflow. During inspiration, the intrapleural pressure decreases also, dipping to -7 or -8 cm H2O below atmospheric pressure. This more negative intrapleural pressure is the result of the increasing recoiling force exerted by the lung as it expands.

5)During expiration there is a net movement of air out of the expanded lungs and the volume of the lungs declines by the tidal volume back to the FRC. Given the outward movement of air, it is clear that the alveolar pressure must be slightly positive, thus increasing above that of atmospheric pressure and in consequence actuating outward airflow. During expiration, the elastic recoil of the lung declines as it contracts; consequently, the intrapleural pressure returns to its previous value of -5 cm H2O, thus reestablishing the original FRC lung volume.

The above graphs show the relationships between inspiratory lung volume, alveolar pressure, intrapleural pressure, and airflow during a single cycle of breathing. Note how inspiration is achieved by generating increasingly negative intrapleural

**Q 2:** (A) What is urinary system?

Ans urinary system, also called the renal system or urinary tract, removes waste from your blood in the form of urine. It also helps regulate your blood volume and pressure, and controls the level of chemicals and salts (electrolytes) in your body's cells and blood.

 urinary system prevents waste and toxins from building up in your blood. It also:

helps regulate your blood pressure

maintains your body's water balance

helps keep bones strong and healthy

controls the levels of chemicals and salts in your blood

helps make your body's red blood cells

Your urinary system is made up of:

2 kidneys – organs that filter blood to make urine

the bladder – an organ for storing urine

2 ureters – tubes connecting your kidneys to your bladder

the urethra – a tube connecting your bladder to your body's surface



 (B) What are the organs involve in urinary system? Explain that organs and its function.

(Ans) The organs of the urinary system include the kidneys, renal pelvis, ureters, bladder and urethra. The body takes nutrients from food and converts them to energy. After the body has taken the food components that it needs, waste products are left behind in the bowel and in the blood

B) In an organ, different tissues work together to carry out a particular function. These are the main organs, as well as their primary function:

The brain controls thoughts, memory and other organs.

The heart pumps blood around the body.

The lungs separate oxygen from the air and remove carbon dioxide from the blood.

The stomach helps to digest food.

The intestines absorb nutrients from food.

The liver removes poisons from the blood.

The kidneys filter blood and produce urine.

The bladder stores urine.

The skin protects and contains the other organs

**Q3:** (A) Write a difference between small and large intestine in detail.

Ans difference between small and large intestine in detail

The small intestine is 4.5-7.0 m in size long, but is narrow in width of around 3.5-4.5 cm only, whereas Large intestine measures around 1.5 m in size in length and width of 4-6 cm in diameter, and due to this broadness difference in the tubes of the large intestine and small intestine, they are named accordingly.

Small intestine is divided three parts, which are duodenum, jejunum and ileum which helps in absorption of nutrients from the digested food, while Large intestine has four parts, which are colon, rectum, caecum and anal canal which helps in absorption of water and electrolytes, as well in production of vitamins like B and K with removing of waste material.

Circular folds also called as ‘palicae circulares’ as present in the internal surface of the small intestine, whereas it is absent in large intestine.

The presence of Villi is what makes small intestine different from the large intestine, as villi are the important constituents which are helpful in absorbing nutrients from the food. This function is absent in large intestine and thus capable of absorbing water and electrolyte and iron.

Peyers Patches which are the aggregations of lymphoid tissue present on the mucous membrane of the small intestine, while it is absent in large intestine.

Taenia Coli and Hastura is absent from the surface of the small intestine, whereas they are present in the large intestine.

Small intestine shows small movements in the abdominal cavity whereas Large intestine is fixed or show very little mobility.

Digestion is complicated in the small intestine; large intestine has no role in digestion rather it helps in absorption of water and electrolytes.

Numerous hormones are secreted by small intestine; No hormones are secreted by the large intestine.

Small intestine forms the layer of continuous bands of muscles around it, while Large intestine is reduced to three types of muscles bands called as taeniae coli.

Epiploic appendages (fatty tags) is absent in small intestine; This appendages are present in the large intestine.

The main activity of small intestine is to absorb the digested nutrients and it also shows small movements in abdominal activity, and the main function of the large intestine is in the absorption of water and electrolytes as well it shows less mobility and is largely fixed.

