**7****IQRA NATIONAL UNIVERSITY**

**DEPARTMENT OF ALLIED HEALTH SCIENCES**

**Final-Term Examination**

**HND 2nd Semester**

**Course Title: Human Physiology I Instructor: Dr Sara Naeem**

**Time: 6 Hours Max Marks:50**

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**Q1. Establish a differentiation criteria between arteries, veins and capillaries.**

**Arteries:**

**Definition:**

. Any of the muscular walled tube forming part of the circulations systems by which blood mainly that oxygenated is conveyed from the heart to all parts of the body.

**Functions:**

**.**  Arteries are blood vessels responsible to carrying oxygen rich blood away from the heart to the body.

**Structure:**

**.** Strength and elasticity needed to withstand the pulsing of the blood, prevent bursting and maintain pressure waves .

. Help to maintain high blood pressure, preventing blood flowing backwards.

**Types of arteries:**

There are 3 types of arteries.

1. Elastic arteries
2. Muscular arteries
3. Arterioles.

**Veins :**

**Definition:**

Any of the tubes forming a part of the blood circulation system of the body, carrying in most cases oxygen-depleted blood toward the heart.

**Functions:**

Return blood back toward the heart.

. Most veins carry deoxygenated blood from the tissues Back to the hart.

. Exception are the pulmonary and umbilical veins both with carry oxygenated blood to the heart.

. In contrast to veins arteries carry blood away from the heart.

**Structure:**

**.** There are 3 layers of vein.

**1. Outer layer:** The outer layer is called connective tissues.

**2. Middle layer:** The middle layer is called smooth muscles.

**3. Inner layer:** The inner layer is lined with endothelial cells .

**Types of veins:**

There are 4 types of veins:

* Deep veins
* Superficial veins
* Pulmonary veins
* Systemic veins

**Capillaries:**

**Definition:**

**.** Any of the branching blood vessels that are form a network between the arterioles and vessel.

**.** Surrounded body cells and tissues to delivers and absorb oxygen, nutrient and other substances.

**Functions :**

. Capillaries are tiny blood vessels so small that a single red blood cells can fit through them. . They help to connect artery and veins in additional to exchange of certain elements between blood and tissues.

. **Structure:**

**.** Capillaries are very thin.

**.** 5 micrometer in diameter.

**.** Composed of 2 layers of cells.

1. Inner layer cell: Endothelial cells
2. Outer layer cell: Epithelial cells.

**Types of capillaries:**

. There are 3 types of capillaries:

1.continuous capillaries

2.Fenestrated capillaries

3.Sinusoidal capillaries.

**Q2. Name classes of antibodies. What are the characteristics of antibodies.**

**Antibodies:**

**.** The antibodies is a large protein, constitutes Y- globin produced by plasma cells.

. It is used by the immune system to identify and neutralize pathogens such as bacteria and viruses.

. Antibodies are also called immunoglobulins.

. The antibodies recognizes a unique molecules of the harmful agents called antigen.

**Nature of antibodies:**

**.** Gamma globulins is called immunoglobulin

. Constant portions determined other properties of antibody.

. Constitutes 20% of all the plasma proteins.

. Variable portion attaches to a particular type of antigen.

. Combinations of light and heavy polypeptides chain.

**Classes of antibodies:**

The classes of antibodies are

. IgM

. IgG

. IgA

. IgE

. IgD

. IgM gives the largest share of antibodies in primary response.

**Characteristics of antibodies:**

**. IgM:** Levels decrease during stress.

. Found in blood and lymph.

. First antibody produced with primary immune response.

. High concentrations early in infections.

**. IgG:** Found in blood, lymph and intestine.

. Active against bacteria, its toxins and viruses.

. Enhance phagocytosis, crosses placenta and is active in a second response.

**. IgA:** saliva, tears, bronchial, GI, prostatic and vaginal secretions

. Provide local protection on exposed mucous membrane surfaces and potent antiviral activity.

. Prevents absorption of antigen from food, and protects against respiratory, GI and GU infections.

**. IgE:** Found on mast cells and basophils.

. Involve in immediate hypersensitivity response.

**IgD:** unknown functions.

. Found in blood and lymph..

**Another characteristic of antibodies are:**

1. Diversity
2. Long memory
3. Specificity
4. Inflammatory response
5. **Diversity:** Response to different antigens.
6. **Long memory:** Response many years after initial exposure due to memory T cells and B cells.
7. **Specificity:** Actions specifically directs against antigens that initiated response.
8. **Inflammatory response:** combined effects of cells ( T cells, B cells, macrophages, and neutrophils ) and proteins.

**Q3. Explain the significance of lymphatic ducts.**

**Lymphatic system:**

. Transport clean fluids back to the blood.

. Removes “ debris" from cells of body.

. Drains excess fluid from tissues.

. Transport fats from digestive system.

**Lymphatic ducts:**

. A lymphatic duct is a great lymphatic vessels that empties lymph into one of the subclavian veins.

 **Significance of lymphatic duct:**

1.Right lymphatic ducts.

2.Thoracic ducts

**1. Right lymphatic duct:** Duct empties at junction of the right internal jugular and right subclavian veins .

**2. Thoracic duct:** Empties into junctions of left internal jugular and left subclavian veins.

Cisterna Chyli- most inferior part of thoracic duct.

**Lymphatic capillaries :** Fluids leak through mini valves into lymph capillaries.

**Lymphatic vessels: .** Collect lymph from lymph capillaries .

**Lymph nodes:** Filter lymph before it is returned to the blood.

.Defense cells in nodes : Macrophages and Lymphocytes.

**Flow of lymph through nodes:** Lymph flows through a number of sinuses inside the nodes.

**Lymphoid organs: .** Spleen, thymus, tonsils, peyer’s patches.

**Spleen:** filter blood.

. Destroy worn out blood cells.

. Form a blood in fetus.

**Thymes: .** Functions at peek levels only during childhood.

. Produce hormones like thymosin to program.

**Tonsils: .** Small mases of lymphoid tissue around the pharynx.

. Trap and remove bacteria and other foreign material.

**Peyer's patches:**  Tonsil of intestine.

. Found in the wall.

. Capture and destroy bacteria in small intestine.

**Q4**. **What are the clinical manifestations of a patient having kidney disease. Also write functions of kidney.**

**Kidney:**

**Definitions:** The kidneys are the pair of excretory organs situated on the posterior abdominal wall, one on each side of the vertebral column, behind the peritoneum.

**Locations:** Thorax vertebrae T12 to third lumber vertebra L3.

**Length:** 11 cm long.

**Color:** reddish brown.

**Width:**  5cm broad .

**Thickness:** 3 cm.

**Weight:** male: 150gm, female:135gm.

**Clinical manifestations of patient having kidney diseases :**

Patient with this common conditions, kidney diseases is a progressively deplitating conditions that leads to end stage renal diseases. In which the kidney cease to support daily bodliy function required a dialysis.

.symptoms of the kidney patients :

1. Puffiness around the eyes
2. Ankles and feet are swallow.
3. Poor appetite
4. Muscles are cramping.
5. Less energy
6. Having trouble sleep.
7. Itching
8. Dry skin
9. Humbness in hand.
10. Experiences excessive thirst and breath.
11. Back pain

**Functions of kidney :**  The nephron is the functions of the kidney.

. Excretion of wastes and other foreign substance.

. Regulations of blood ionic composition.

. Regulations of blood pH..

. Productions of hormones

. Regulations of blood pressure.

. Regulations of blood volume.

. Regulations of blood osmolality.

. Regulations of blood glucose level.

**Q5. What is the difference between systemic circulation and pulmonary circulation. Give signs and symptoms of Myocardial Infarction.**

**Differentiate between systematic and pulmonary circulations.**

The cardiovascular system is composed of two circulatory paths.

**Systematic circulations:**  The circuit through the rest of the body to provide oxygenated blood.

. High blood pressure.

. High resistance

. Low compliance

**Pulmonary circulations:** The circuit through the lungs where blood is oxygenated.

. Low blood pressure

. Low resistance

. High compliance.

**Myocardial infractions:**

**Signs and symptoms:**

1. Pain is similar to anginal pain and may reduce to the arms , neck jaws and back.
2. Dyspnea
3. Anxiety/ agitation
4. Syncope
5. Sense of impending doom.
6. B
7. Nausea
8. Vomiting
9. Diaphoresis
10. Cyanosis
11. Palpitations.

 **Finish**