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Paper :- Physiology

: Final-Term Examination :

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Question no: 1

Establish a differentiation criteria between arteries, veins and capillaries.

:- **Difference between arteries, veins and capillaries:-**

Arteries	Veins	Capillaries
Direction of blood flow		
Transport blood away from the heart.	Connect arterioles to venules.	Transport blood to heart.
Wall		
Thick muscular wall	Thinnest wall, one cell in thickness.	Thinner wall.
Valve		
No valves except semilunar valves at the base of aorta and pulmonary artery.	Valves present to prevent back flow of blood.	No valves.
Pressure		
Blood flows in pulses under high pressure.	No pulses. Blood flows under lower pressure than arteries.	No pulses. Pressure lower than arteries but higher than veins.

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Wall Layers		
Three layers • Tunica adventitia • Tunica media • Tunica intima	Three layers Tunica adventitia Tunica media Tunica intima	One layer Tunica intima.
Muscle and Elastic fibres		
Large amount	Small amount	None
Lumen Diameter		
Narrow	Wide	Extremely thin (single cell thick)
Colour		
Red in colour	Bluish red	Bluish red
Type of blood		
Excepting the pulmonary artery all other arteries carry oxygen enriched blood.	Excepting the pulmonary vein other veins carry carbondioxide enriched blood.	Allow the movement of oxygen, nutrients, and metabolic wastes between blood and extra cellular fluid.
Size		
Large to very small as they branch.	very small to large as branches join	Microscopic.

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Question no :- 2

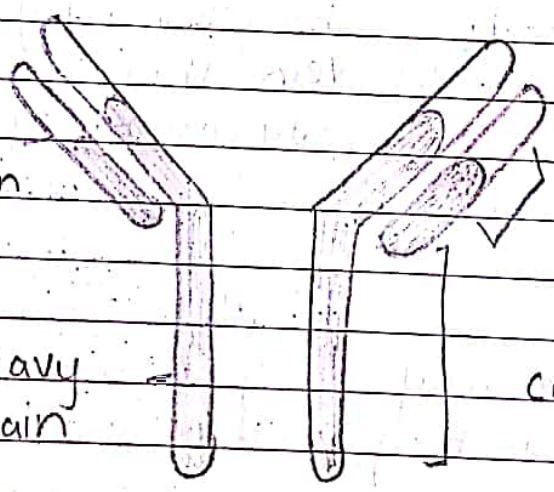
Name classes of antibodies. What are the characteristics of antibodies.

Answer :-

Antibody :-

Antibody is a large protein, constitutes γ-globulin produced by plasma cells. It is used by the immune system to identify and nutralize pathogens such as bacteria and viruses. Antibodies are also called Immunoglöblins.

Basic Structure of Antibody :-



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Different Classes of Antibodies:-

There are five classes of antibodies :

1- IgG 2- IgM 3- IgA 4- IgD 5- IgE

- These antibodies classes are named as correspond to their heavy chain types.

1- IgG:-

- They make up approximately 80% of the
- Serum antibodies.
- They has a half-life of 7-23 days.
- IgG is a monomes and has 2-epitope binding sites.
- Immunity to new born.

2- IgM:-

- They makes up approximately 13% of the serum antibodies.
- They has a half life of about 5 days.
- Their function is activation of classical pathway.
- Act as opsonin
- Defence against multivalent antigens.

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3- IgA :-

- They makes up approximately 6% of the serum antibodies.
- They has a half-life of approximately 5 days.
- Their function is Production to Infant gut.
- It as a Secretory antibody.

4- IgD :-

- They make up approximately 0.2% of the serum antibodies.
- IgD is a monomer and has 2-epitope binding site.
- Their function is B-cell activation.
- Act a receptor for antigen binding.

5- IgE :-

- It was discovered by kandT Ishizaka.
- It is very low concentration in blood.
- Responsible for Immediate hypersensitivity.
- Binds to fc receptor on basophils and mast cells.
- Release of substance like histamine, vasoactive mediators.

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Characteristics of Antibodies:-

1- **Diversity:-**
Respond to different antigens.

2- **Long memory:-**
Respond many years after initial exposure due to memory T-cells and B-cells.

3- **Specificity:-**
Actions of specifically directed against antigen that initiated response.

4- **Inflammatory response:-**
Combined effect of cells (e.g T cells, macrophages and neutrophils) and proteins).

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Question no:-3

Explain the significance of lymphatic ducts.

Lymphatic System:-

The lymphatic system is a network of cappillaries, vessels, ducts, nodes and tissues. It is part of circulatory system.

Lymphatic Ducts:-

The lymphatic vessels enter the larger lymphatic ducts which drain the lymph back into the blood vessels to be returned to the heart.

Significance of lymphatic ducts:-

- The right lymphatic duct – the smaller duct which carry blood from the head, neck, thorax and right forelimb into the right side of the heart through the right subclavian vein.
- The thoracic duct – the main lymphatic duct which collects blood from the rest of the body. It transfer blood into the heart through vena cava.

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- There is also a pair of tracheal ducts that drain the head and neck into the thoracic duct or one of the large veins near the heart.
- The lymphatic system's major job is to collect extra lymph fluid from body tissues and return it to the blood.
- This is important because water, proteins, and other substances are always leaking out of tiny blood capillaries into the surrounding body tissues.

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Question no #4

What are the clinical manifestations of a patient having kidney disease. Also write function of kidney.

Answer :-

Clinical manifestation of kidney disease :-

1- **Cardiovascular :.**

High blood pressure, increased heart rate, dysrhythmias, electrocardiographic changes, abnormal heart sounds.

2- **Neurological :-**

Peripheral neuropathy, restless legs, change in level of consciousness, lethargy, confusion, altered motor function.

3- **Gastrointestinal :-**

Anorexia, nausea, vomiting, metallic taste in mouth, bleeding in gastrointestinal tract.

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4- **Renal:-**
Decreased urine output, azotemia, proteinuria, hematuria, hyperuricemia.

5- **Respiratory:-**
Increased respiratory rate, crackles, decreased PO_2.

6- **Integumentary:-**
Bruises, pruritus, dry skin, skin color changes ashen gray to yellowish, dry brittle hair and nail.

7. **Immune:-**
Increased risk of infection.

Function of kidney:-

Maintaining Acid-base balance.
Maintaining Water balance
Electrolyte balance
Toxin removal
Blood Pressure control
making Erythropoietin
Vitamin D metabolism.
Excretion of waste and foreign substance
Synthesis of renin.
Glyconeogenesis.

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Question no #5

What is the difference between systemic circulation and pulmonary circulation. Give signs and symptoms of myocardial infarction.

	Pulmonary Circulation	Systemic Circulation.
1-	Pulmonary circulation carries deoxygenated blood from the right ventricle of the heart to the lungs through the pulmonary artery.	Systemic circulation carries oxygenated blood from the left ventricle of the heart to the rest of the body by the aorta.
2-	Carries oxygenated blood from the lungs to the left atrium of the heart by the pulmonary vein.	Carries deoxygenated blood from the body to the right atrium of the heart by the superior and inferior vena cava.
3-	Composed of pulmonary artery and pulmonary vein.	Composed of inferior and superior vena cava, aorta, and other small vessels.

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Carries blood to the lungs.	Carries blood through out the body.
Helps to release carbon-dioxide from the blood while dissolving oxygen in the blood.	Helps to provide nutrients and oxygen to the metabolizing cells in the body.

Myocardial infarction:- (MI)

Also known as heart attack, occurs when blood flow decreases or stop to a part of the heart, causing damage to the heart muscle.

Signs and Symptoms:-

Pressure, tightness, pain or squeezing or aching sensation in your chest or arms.
Nausea, indigestion, heart burn.
cold sweat.
fatigue.
Lightheadedness or sudden dizziness.
Cheast Pain
Difficulty in breathing and dizziness.

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