

Grand Assignment

Course Title: Human Physiology II

Rad 2nd semester section A

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Marks: 20

Note:

INTERNAL ASSESSMENT MARKS WILL BE GIVEN ON BASIS OF GRAND ASSIGNMENT

Q1: What is blood? Explain Composition and Function of Blood.

Ans:

- **BLOOD:**

- Blood is defined as specialized connective tissue, consisting of intracellular substance plasma and formed elements RBC, WBC and platelets; it circulate in closed system of blood vessels and provide a medium to transport substances from one part of body to the other.

- **Composition of blood:**

- 1. Formed Elements:**

- Cellular part, Oie RBC, WBC & platelets =45%

2. Plasma:

➤ Fluid part=55%

(1) Water =91 to 92%

(2) Solids =8 to 9%

(a) Inorganic =Na, K, Mg, P, Fe, Cu

(b) Organic

(i)Proteins - Serum albumin = 4.5g%

- serum globulin =2.5%

- Fibrinogen = 0.3g%

- prothrombin, etc

(ii)Non.protein Nitrogenous substances, eg urea,uric acid, xanthine, Hypoxanthine, creatine, creatinine, NH₃, amino acids etc.

(iii) Fats, **eg** neutral fat, phospholipid, cholesterol etc.

(iv) Carbohydrates, **eg** internal secretions, eg glucose etc.

(v) Other substances, **eg** internal secretions, antibodies, enzymes etc.

• **FUNCTIONS OF BLOOD :**

1. **Respiratory Functions :**

Blood transports O₂ from lungs to tissues and CO₂ from tissues to lungs.

2. **Nutritive Functions:**

It transports food (a) absorbed from GIT & (b) mobilized from storage depots to tissues.

3. **Excretory Function:**

It transport Excretory metabolite and products from tissues to organs of excretion, i.e kidneys, lungs, intestine, skin etc.

4. **Carrier Functions:**

It carries hormones enzymes antibodies, vitamins, inorganic and organic salts and other essential chemicals to their place of activity.

5. Defensive Function:

- a. Neutrophils and macrophages phagocytize bacteria.
- b. antibodies and combat disease-causing organisms.

6. Hemostatic Functions:

It contains clotting factors; so it prevents hemorrhage by coagulation.

7. Regulatory Functions:

Blood regulates;

- i. Water balance
- ii. Acid-Base balance or Blood pH
- iii. Ion balance
- iv. body temperature
- v. Blood pressure
- vi. Blood volume
- vii. Blood viscosity
- viii. Osmotic Pressure

Q 2: Explain Physiology of cardiovascular system.

Ans:

• **Cardiovascular System:**

- The cardiovascular system also known as circulatory system or the vascular system is an organ system that permits blood to circulate and transport nutrients (such as amino acids and electrolytes), oxygen, carbon dioxide, Hormones and Blood cells to and from the cells in the body to provide nourishment and help in fighting diseases, stabilize temperature and pH and maintain homeostasis.

• **Function of Circulatory System:**

- 1) Supplies O₂ and substances to tissues.
- 2) Return CO₂ to lung and other metabolic end products to kidneys.
- 3) Regulates Body temperature
- 4) Distribute hormones and other substances that regulate cell functions.
- 5) Maintains proper ionic concentration and thus homeostasis.

- **Functional part of circulatory system:**

- 1) Arteries
- 2) Arterioles
- 3) Capillaries
- 4) Venules
- 5) Veins

1. **ARTERIES :**

These are blood vessels that carry blood away from heart.

WALL:

Strong & elastic

- **FUNCTIONS:**

1. Transport blood under high pressure to peripheral tissues.
2. Serve as high pressure reservoir to receive pulsatile output of blood from heart.
3. Store part of pumped blood until next heart beat.

Elastic nature of Arteries:

It means that arteries stretch as blood enters and they recoil to smaller size as blood flows out of them.

Importance of Elastic nature :

- 1) It prevents arterial pressure from rising too high during systole.
- 2) It maintains a high arterial pressure b/w heartbeats for continued blood flow.

2. **Arterioles:**

These are smaller branches from arteries.

- **WALL:**
 - They have strong muscular wall that can constrict to close completely or can dilate.
- **FUNCTION:**
 - They act as control valves which blood is released into capillaries.

3. **Capillaries:**

These are smallest blood vessels that connect Arterioles and Venules.

- **WALL:**
 - They have thin, semi-permeable membrane like walls.
- **FUNCTIONS:**
 - They allow two way diffusion of gases, fluids, nutrients, electrolytes, hormones etc b/w flowing blood and interstitial fluid.

4. **VENULES:**

These are blood vessels that connect capillaries with veins.

- **WALLS:**
 - They have thinner walls than Arterioles.
- **FUNCTIONS:**
 - They collect blood from capillaries.

5. **VEINS:**

These are blood vessels that carry blood towards heart.

- **WALLS:**
 - They have thin muscular walls with valves in their lumen.
- **FUNCTIONS:**

They

- 1) Transport blood from peripheral tissues back to heart.
- 2) Can dilate to store blood.

- 3) Can constrict to make stored blood available when it is needed by other parts of circulation.
- 4) Propel blood forward by venous pump.
- 5) Regulate cardiac output.

Q3: Explain Physiology of Pulmonary System Circulation

Ans:

- **Pulmonary system circulation:**
 - Pulmonary circulation moves blood between the heart and the lungs. It transport de-oxygenated blood to the lungs to absorb oxygen and release carbon dioxide. The oxygenated blood then flows back to heart. Systemic circulation moves blood between the heart and the rest of the body.
- **FUNCTIONS:**
 - The pulmonary circulation has many essential functions. It's primary function involves the exchange of gases across the alveolar membrane which ultimately supplies oxygenated blood to the rest of the body and eliminates carbon dioxide from the circulation.
 - The bronchial circulation provides oxygenated blood to the lung parenchyma.
 - There is an overlap between the bronchial and pulmonary circulation in terms of oxygenating the lungs, especially near the central regions.
 - The peripheral aspects of the lung becoming increasingly dependent on the pulmonary circulation and is more prone to infarction as a result.
 - The low pressure venous system and an intricate system of lymphatics ensure that there is no build up of edema fluid in healthy lungs.

**ALL THE STUDENTS ARE REQUESTED TO UPLOAD YOUR
ASSINGMENT BEFORE FINAL TERM EXAM.**
