

BIOLOGY 15.1



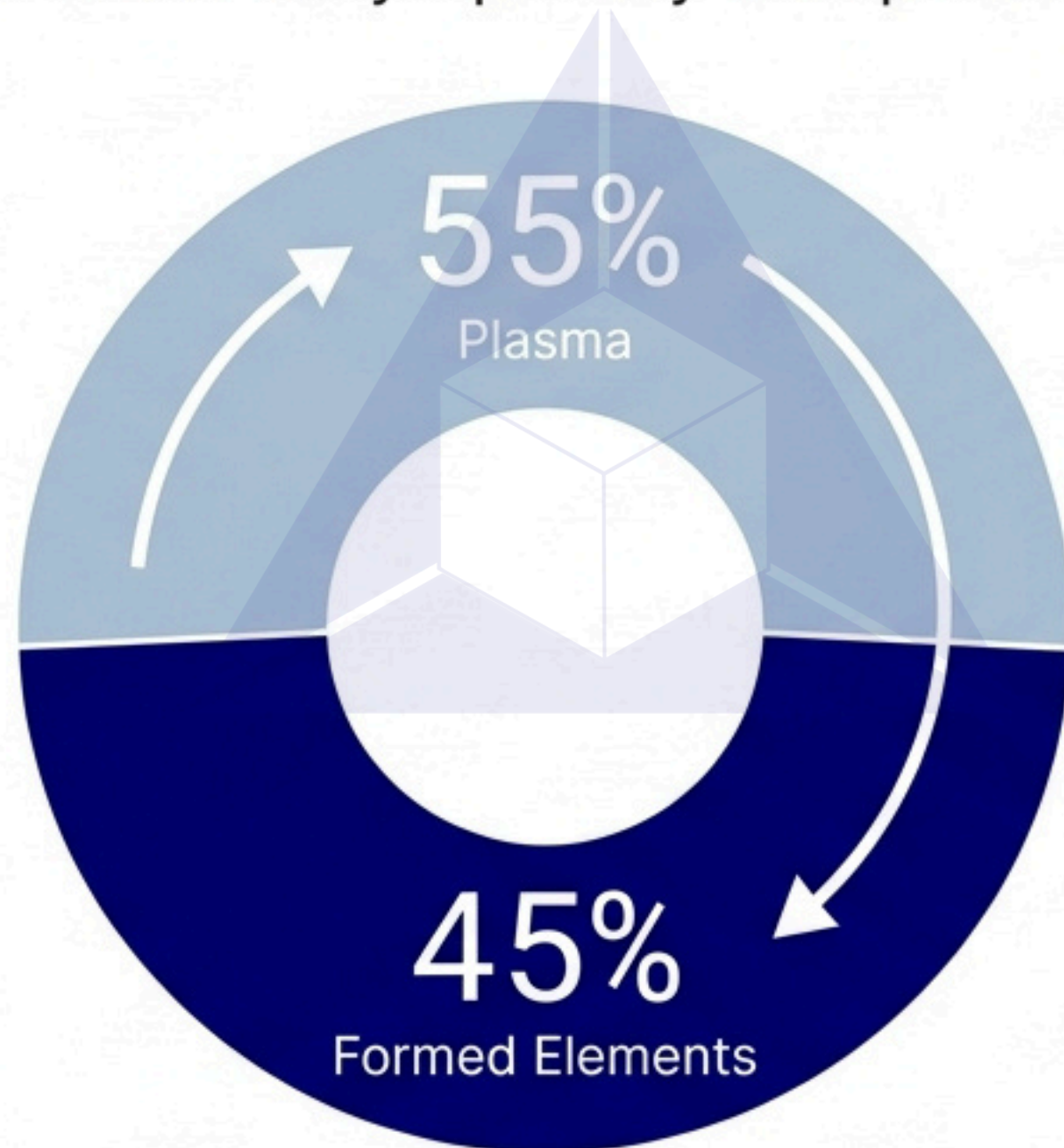
The Fluid Connective Tissue

Anatomy, Composition, and Function of Human Blood



More Than a Liquid: A Specialized Tissue

Unlike other tissues, blood is unique because its extracellular matrix is entirely fluid, allowing it to act as the body's primary transport mechanism.



Plasma

The fluid matrix. A straw-colored, viscous carrier medium.



Formed Elements

The cellular components. Comprises erythrocytes, leucocytes, and platelets.



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

Practice Now



At prep.topall.app

Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



Plasma: The Biochemical Carrier

Plasma is a viscous, straw-colored fluid comprising 55% of **55%** of blood volume. It is highly optimized for transporting nutrients, minerals, and defense mechanisms.

6–8%
Proteins

90–92%
Water

Fibrinogen
Function: Blood coagulation/clotting.

Globulins
Function: Defense mechanisms (antibodies).

Albumins
Function: Osmotic balance maintenance.

Minerals & Transit Elements

Na⁺, Ca⁺⁺, Mg⁺⁺, HCO₃⁻, Cl⁻ glucose, amino acids, lipids



Clinical Note: Plasma stripped of its clotting factors is referred to as **Serum**.

The Formed Elements: Cellular Components



Constituting 45% of blood, these distinct structures are produced in the bone marrow and perform specialized physiological tasks.



**Erythrocytes
(RBCs)**

Count

5.0 - 5.5M mm⁻³

Lifespan

120 days (destroyed in spleen/graveyard)

Features

Biconcave, anucleated, contains hemoglobin (12-16g / 100ml)

Function

Respiratory gas transport



**Leucocytes
(WBCs)**

Count

6,000 - 8,000 mm⁻³

Features

Nucleated, colorless, short-lived

Granulocytes

Neutrophils (60-65%, phagocytic)
Eosinophils (2-3%, resist infection/allergies)
Basophils (0.5-1%, inflammatory/histamine)

Agranulocytes

Lymphocytes (20-25%, B & T immune response)
Monocytes (6-8%, phagocytic)



**Platelets
(Thrombocytes)**

Count

1.5 - 3.5 Lakhs mm⁻³

Features

Megakaryocyte cell fragments

Function

Coagulation cascade activation

The System in Harmony

Blood acts as the body's ultimate logistical and defense network, ensuring homeostasis across all organ systems.



1. Distribution

Delivers O₂, nutrients, and hormones while removing CO₂ and metabolic waste.

Driven by Plasma and Erythrocytes.



2. Protection

Neutralizes pathogens and resists infections through a sophisticated cellular network.

Driven by Leucocytes and Globulins.



3. Preservation

Prevents catastrophic fluid loss through rapid trauma response.

Driven by Platelets and Fibrinogen.



You've Learned the Theory.

Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

That's exactly what TopAll Pro is built for.

Try TopAll Pro Now

What TopAll Pro Does Differently

-  **Stuck? Snap it. Solve it. — Doubts AI**
Photo → step-by-step solution in seconds, 24/7
-  **Your AI Coach finds your blind spots**
Concept-level weakness detection — not just chapter-level
-  **4.5 Lakh+ questions. Never run out.**
13× more content than any other prep app in India
-  **Build your own test in 60 seconds**
Pick a chapter, set difficulty — AI does the rest instantly.
-  **AI Recommendation that helps you improve**
AI Recommendation Analysis your Tests and tell you where you need to improve.



Practice the moment you finish studying
Jump in while the concept is still fresh in your head

4.5L+
MCQs

1.5L+
Students

AI Powered
In-Depth Analysis