

CLASS NINE ACADEMIC PROGRAM 2023

BIOLOGY FREE CLASS

Chapter 06 : Transport in ²Organisms



উদ্ভাস

একাডেমিক এন্ড এডমিশন কেয়ার



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L-01



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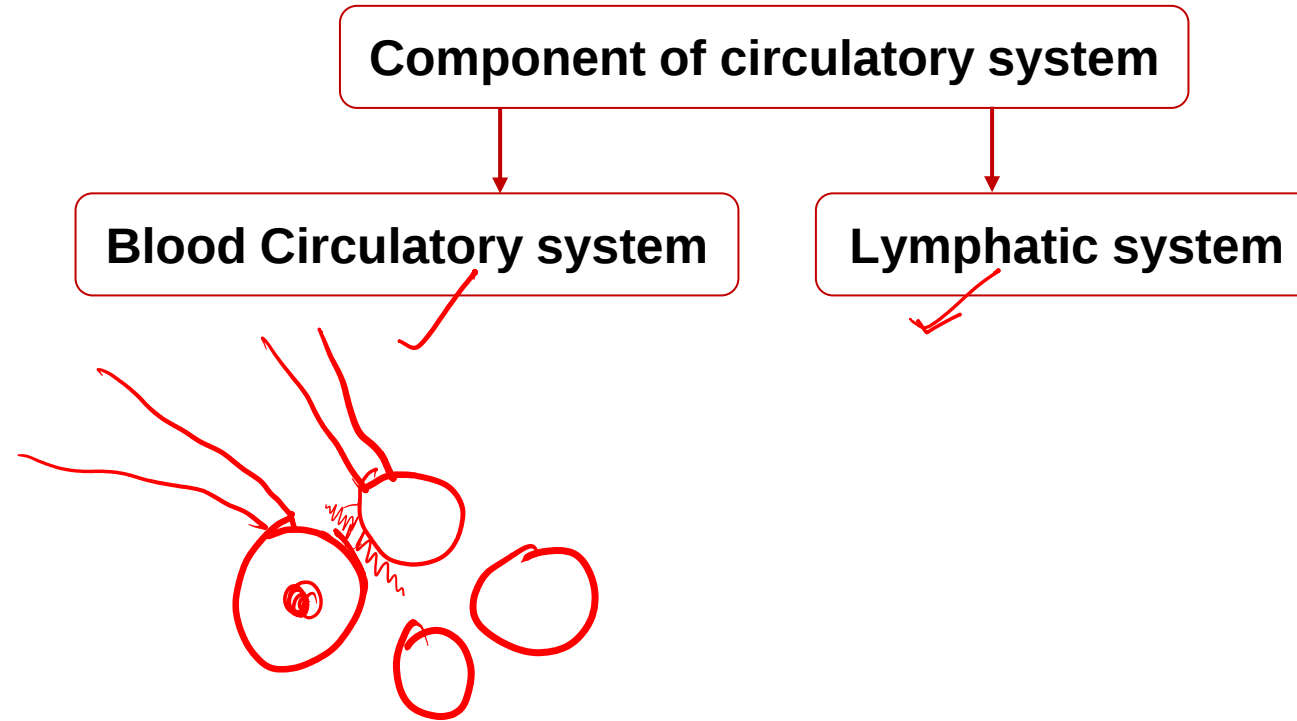
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Components of Circulatory System



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Blood



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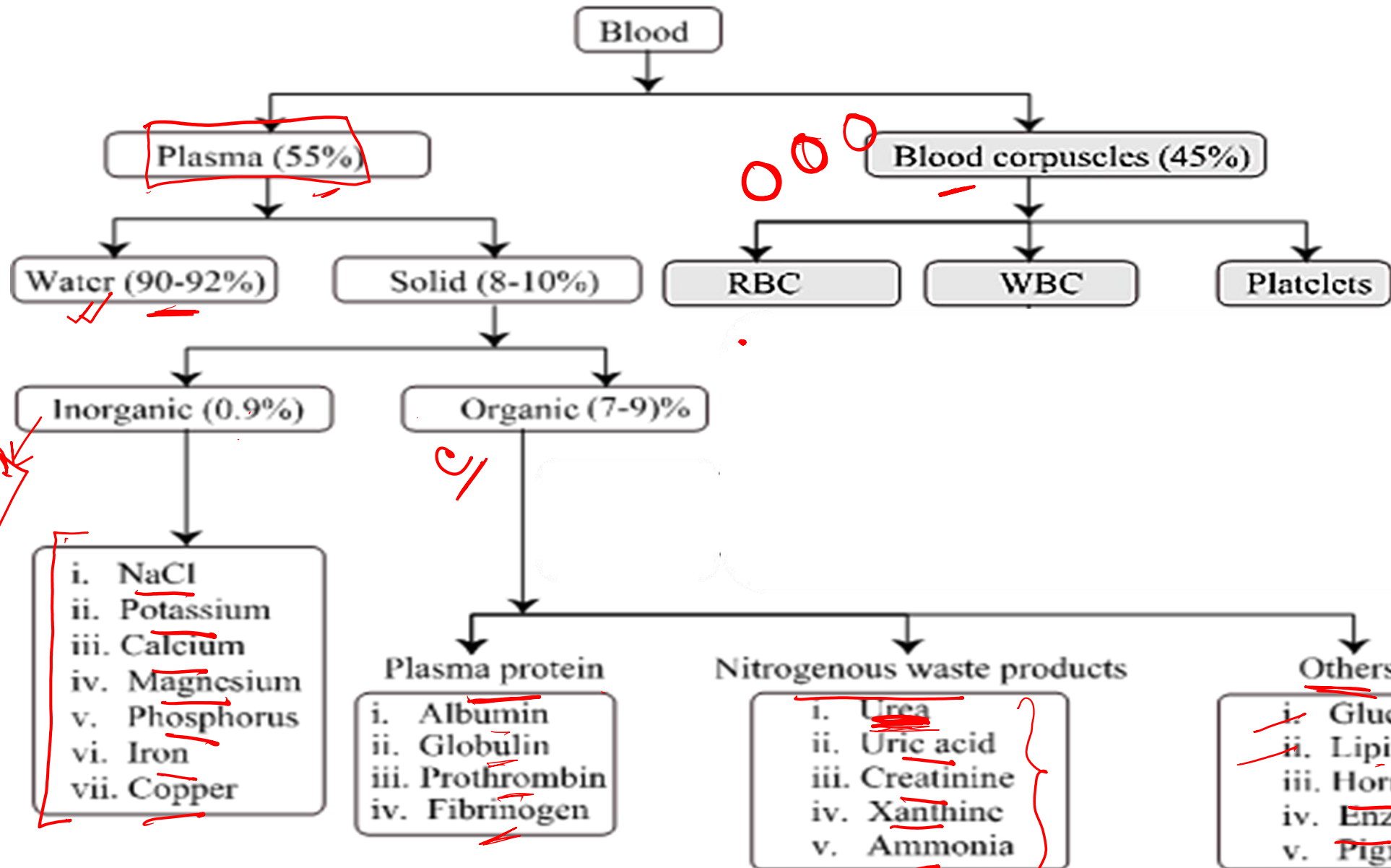


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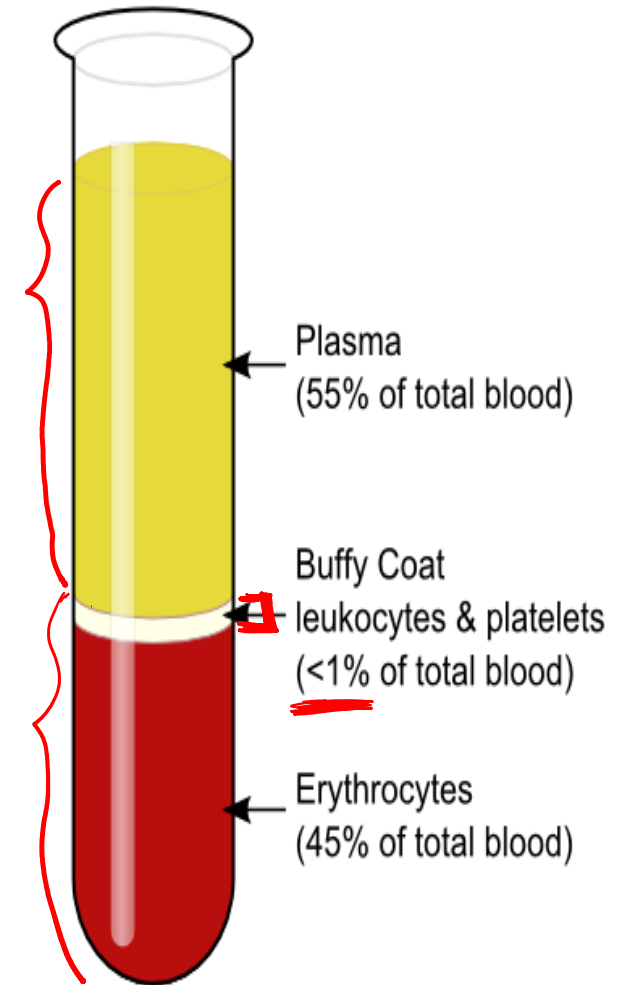
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Frequency	Percentage
Daily	45%
Weekly	35%
Monthly	20%

Functions:

- Most of the CO_2 and a small portion of O_2 is transported via plasma.
 - Plasma maintains the acid-base balance of blood.
 - Contains antibody.
- ↓
 Protection
 Blood grouping
 $\text{pH} = 7$
 $\text{pH} < 7$ acid
 $\text{pH} > 7$ basic
 $\text{pH} = 7.3 - 7.4$ ✓



Poll Question-01

❑ What is the percentage of blood corpuscles in blood?

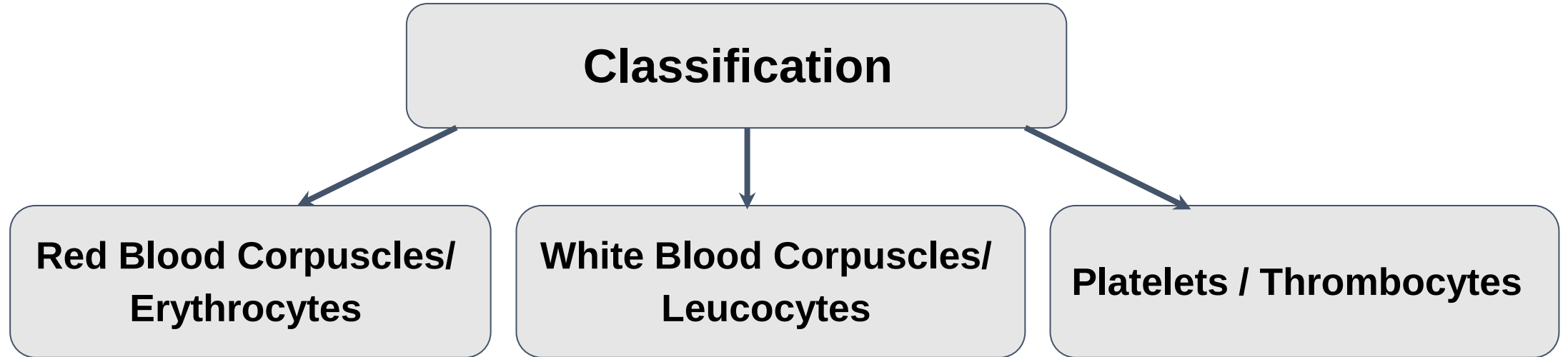
(a) 55%

✓ (b) 45%

(c) 30%

(d) 60%

Blood Corpuscles



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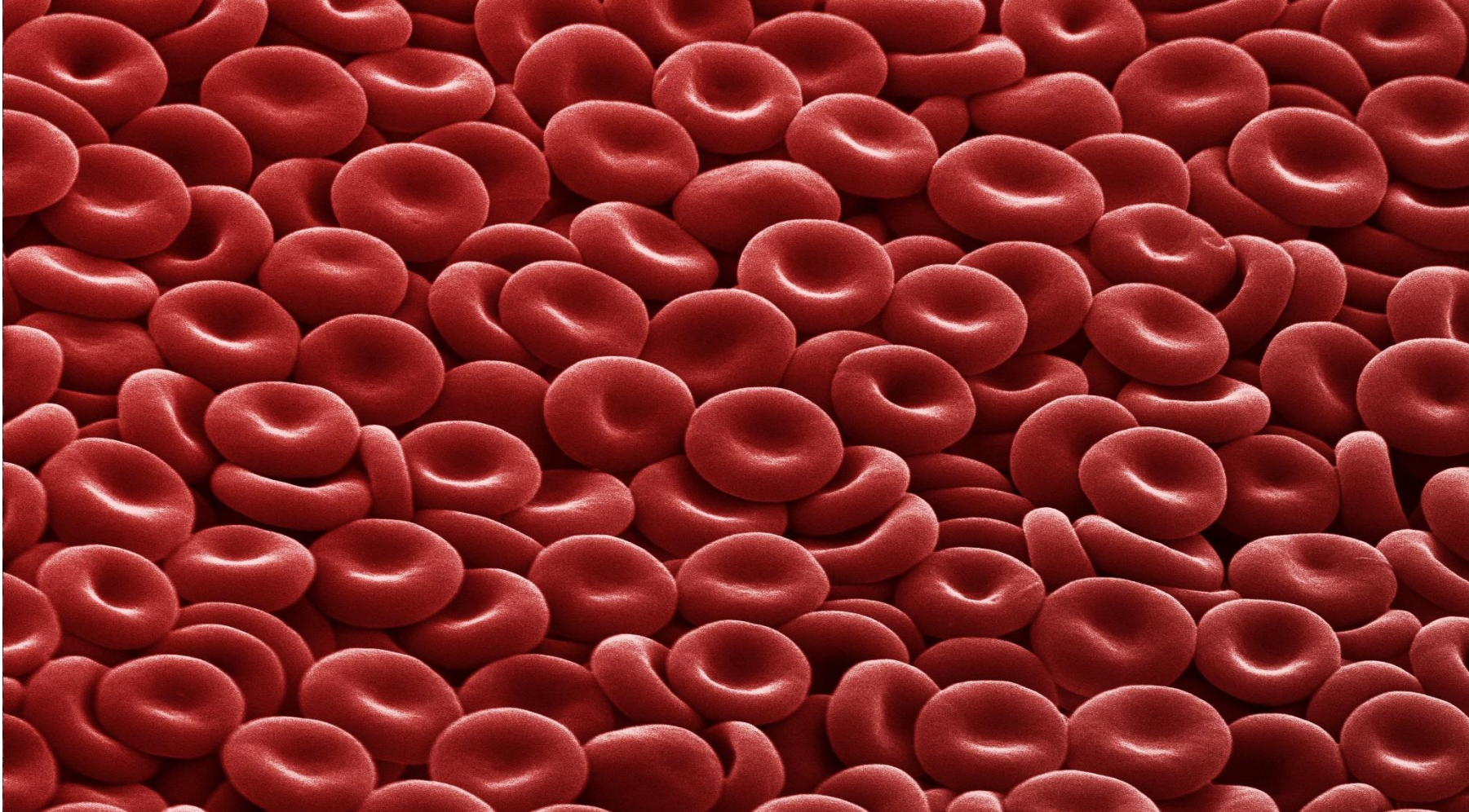
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RBC



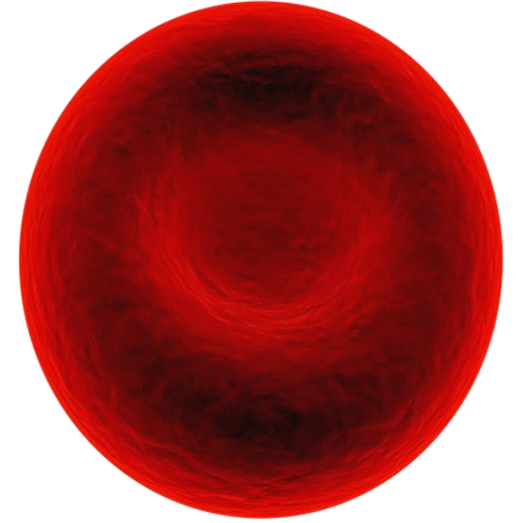
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Red Blood Corpuscles

- Bi-concave
- flexible
- elastic
- Non-nucleated
- Red in colour due to presence of Hemoglobin
- Number : 4.5-5 lacs in mm³ blood
- Life span : 120 days
OXO



Functions

- Transports O_2 mostly and less amount of CO_2 .
- Maintains density of blood.
- RBC maintain acid-base balance of blood by acting as buffer.
- Antigen present on the surface of red cells is responsible for blood grouping.
- These corpuscles produce bilirubin in blood.

RBC
↓
Bilirubin
→ excreted from body
Jaundice
↓
↑ Bilirubin (yellow)

Antigen present in RBC

Antibody present in plasma

A
B
AB
O



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Break
3.45-3.55

L-02



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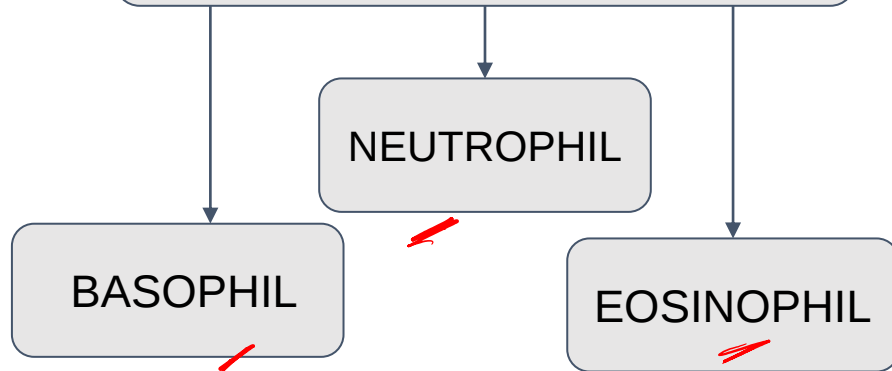
Classification of WBC

Number :

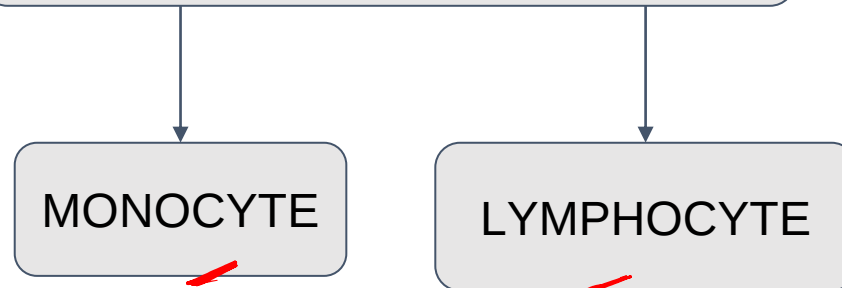
Life span :

4 - 10 thousands per cubic mm of blood
1 - 15 days

GRANULOCYTES



AGRANULOCYTES



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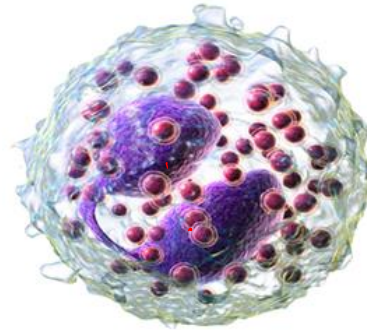
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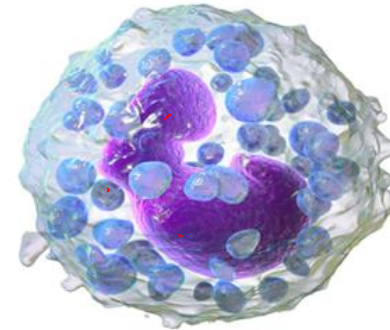


Monocytes

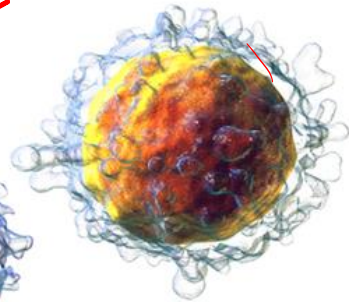
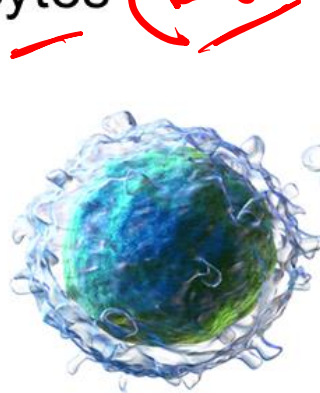
(Biggest)



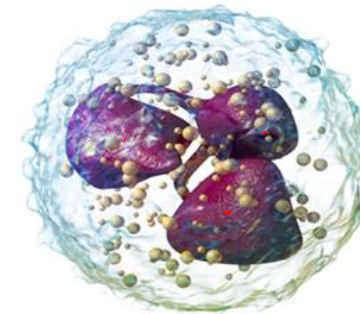
Eosinophil



Basophil



Lymphocytes



Neutrophil

(Most in numbers)

White Blood Cells



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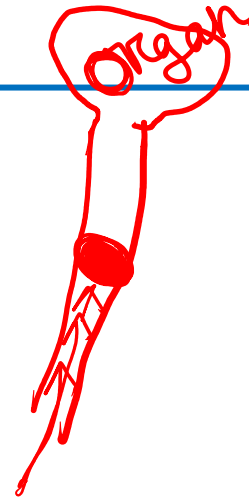
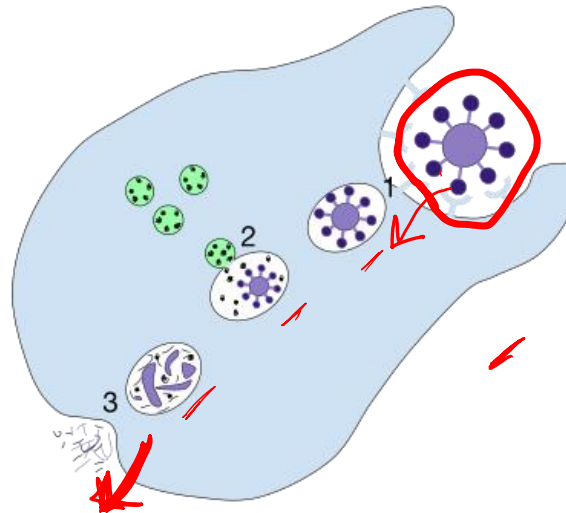
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Functions of the Leucocytes

- ✓ **Monocyte** and **neutrophil** destroy pathogen by **phagocytosis**.
- ✓ **Lymphocyte** produces **antibody** which prevents disease.
- ✓ **Basophil** produces heparin which **prevents blood coagulation within blood vessels**.
- ✓ **Eosinophil** prevents **allergy** in the body.



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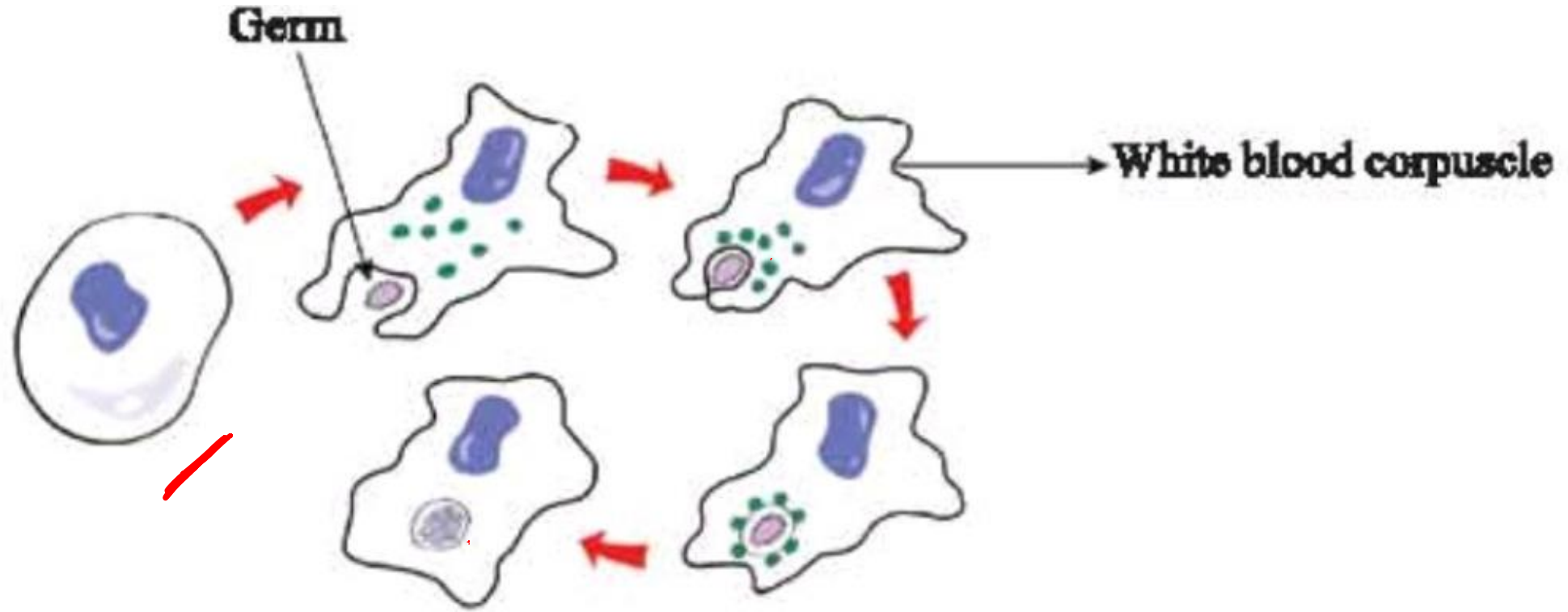


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**Figure 6.09 : Destruction of germ by white blood corpuscles
in the process of phagocytosis**



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Poll Question-02

❖ Which one produces antibody?

(a) Basophil

(b) Neutrophil

(c) Monocyte

✓ (d) Lymphocyte

Platelets

- Round, oval or rod like, have no nucleus
- Number : 1.5-2 lacs per cubic mm of blood
- Life span : 5-10 days
- Function : —

Platelets



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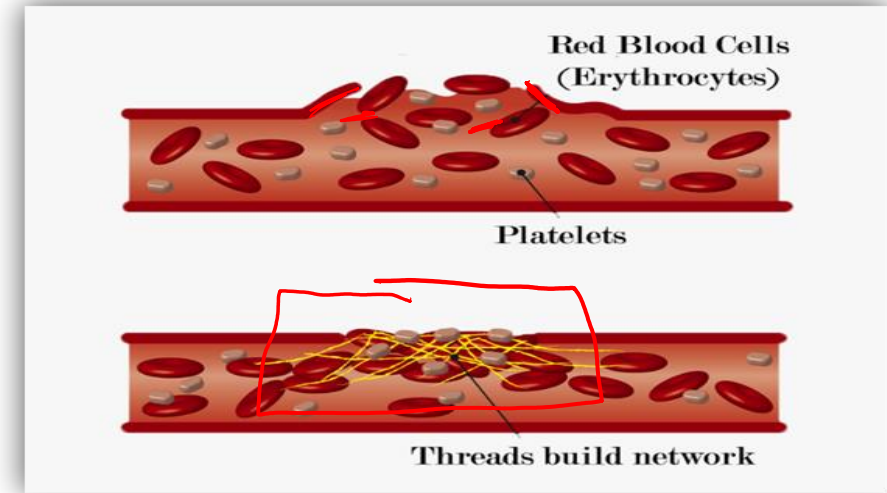
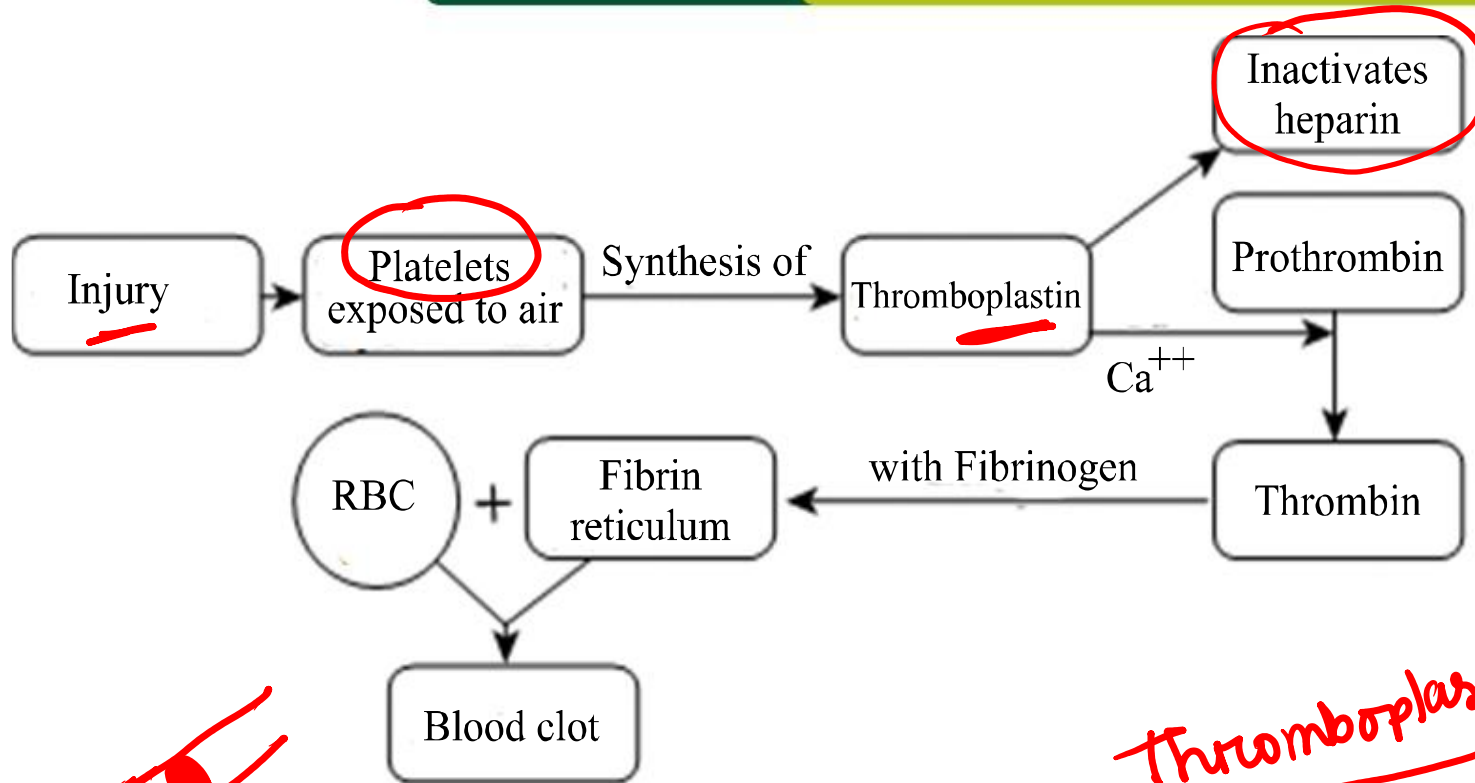
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The difference between RBC, WBC and Platelets

Subject	RBC	WBC	Platelets
Number (per cmm)	50 lacs	4000-10000	2.5 lacs
Nucleus	Non-nucleated	Nucleated	Non-nucleated
Color	Red	Colorless	Colorless
Life span	120 days	1-15 days	5-10 days
Shape	Bi-concave & disc shaped	Irregular shaped	Round, oval or rod shaped
Function	O ₂ & CO ₂ transportation	Disease Prevention	Blood clotting

Blood Clotting Process



Handwritten notes in red ink:

Prothrombin $\xrightarrow{\text{Thromboplastin}}$ Thrombin

Fibrinogen $\xrightarrow{\text{Thrombin}}$ Fibrin

(A red grid pattern is drawn next to the word Fibrin.)



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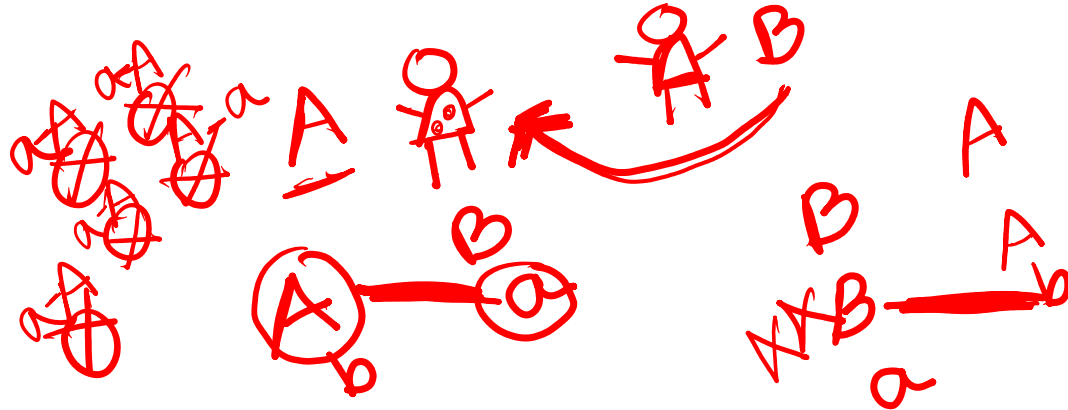
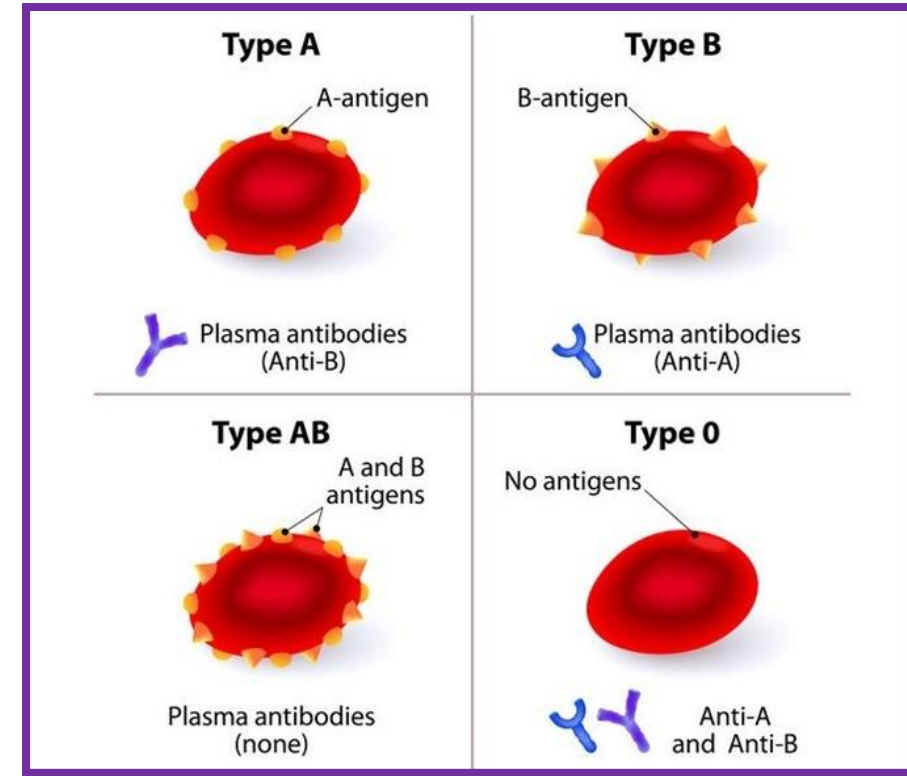
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Why blood normally does not clot within the blood vessel?

- Presence of heparin.
- Rapid flow of blood.
- Smoothness of inner wall of the blood vessel.
- Presence of anticoagulant factors in the blood.

Blood grouping

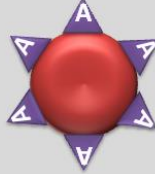
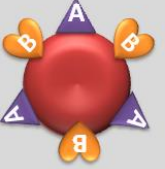
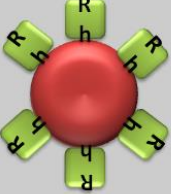
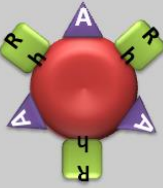
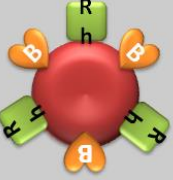
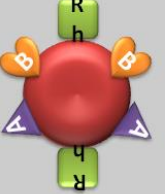
Blood group	Antigen (in RBC)	Antibody (in plasma)	Can donate to	Can receive from
A	A	b	A, AB	O, A
B	B	a	B, AB	O, B
AB	AB	Nil	AB	O, A, B, AB
O	Nil	a, b	A, B, AB, O	O

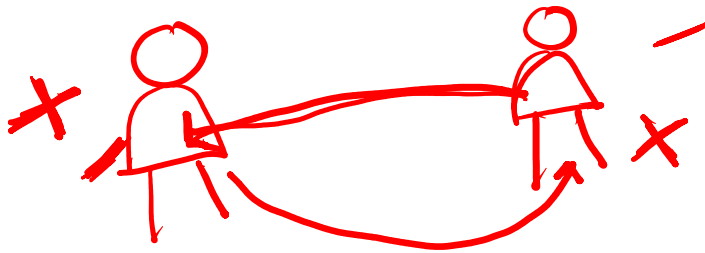


O → Universal donor
AB → Universal receiver

Blood grouping

- 🔴 A person is said to be rh positive if this factor is present in his blood and if not, is called rh negative.
- 🔴 If the rhesus factor is taken into consideration, the blood groups are A+, A-, B+, B-, AB+, AB-, O+ and O-.

O- 	A- 	B- 	AB- 
O+ 	A+ 	B+ 	AB+ 



— can give blood to +
But + can not give blood to —



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		Donor							
		O- ✓	O+ ✓	B-	B+	A-	A+ ✓	AB- ✓	AB+
Recipient	AB+								
	AB-								
	A+								
	A-								
	B+								
	B-								
	O+								
	O-								

Figure 6.12: Blood group compatibility table



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Poll Question-03

❖ Which blood group is called universal recipient?

(a) O

(b) O(−ve)

(c) O(+ve)

✓ (d) AB

Donation of blood and social responsibilities

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দেখো তোমার মুখ;
জীবন মাতে সংগ্রাম
আর বিজয় মাতে সুখ।



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