

YAKEEN NEET 2.0

16.07.2025

2026

BODY FLUIDS AND CIRCULATIONS

ZOOLOGY

Lecture – 3

By- SAMAPTI MAM





Topics to be covered

1

BLOOD GROUPING, [✓]Erythroblastosis [✓]fetalis

2

3

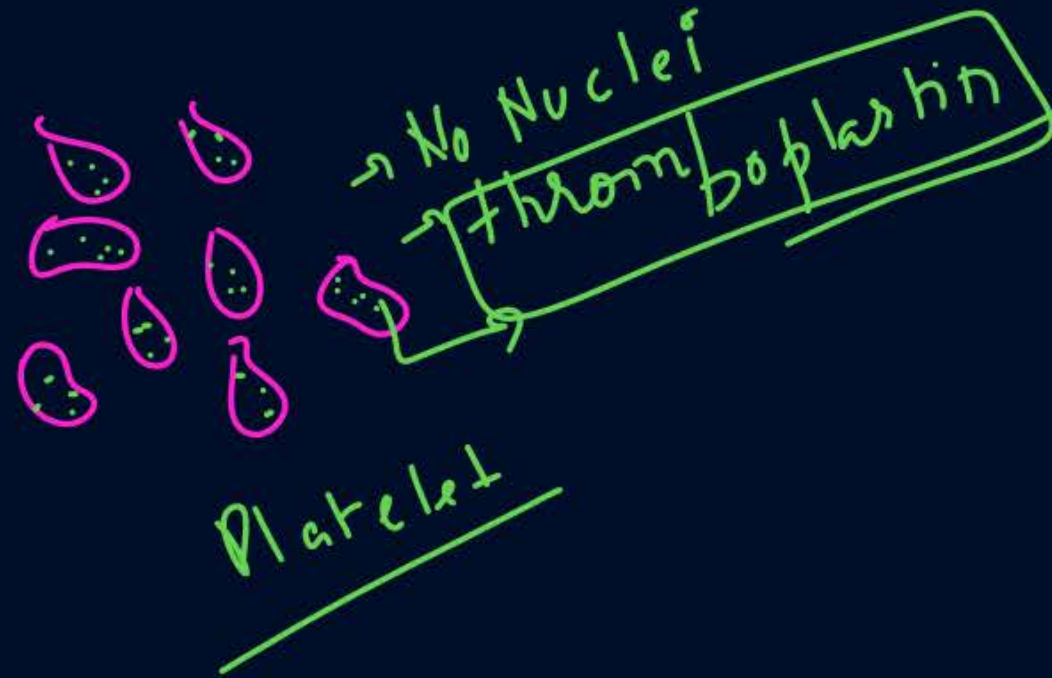
4



Samephiepress



Megakaryo



Blood Clotting / Coagulation:



INJURY

Tissue Injury

Injured tissue secretes 'THROMBOPLASTIN'

attracts Blood Platelets

secretes more 'THROMBOPLASTIN'

Through Cascade of rxn, an enzyme complex formed

THROMBOKINASE

Prothrombin (inactive) $\xrightarrow{Ca^{2+}}$ Thrombin (active)

Fibrinogen (inactive) $\xrightarrow{Ca^{2+}}$ Fibrin (active)

network of threads called clot / coagulum

Clot
dead / damaged elements trapped.







• 'SCUM'
↳ dark reddish Brown.

Blood Grouping:

- 'ABO' grouping
- 'Rh' grouping

ABO grouping:

- ABO grouping: Dependent on: Surface Antigens (Ag) on 'RBC'
- Antibody (Ab) generating substance.
- ↓
- 'Ag' present on own RBC: Self 'Ag'

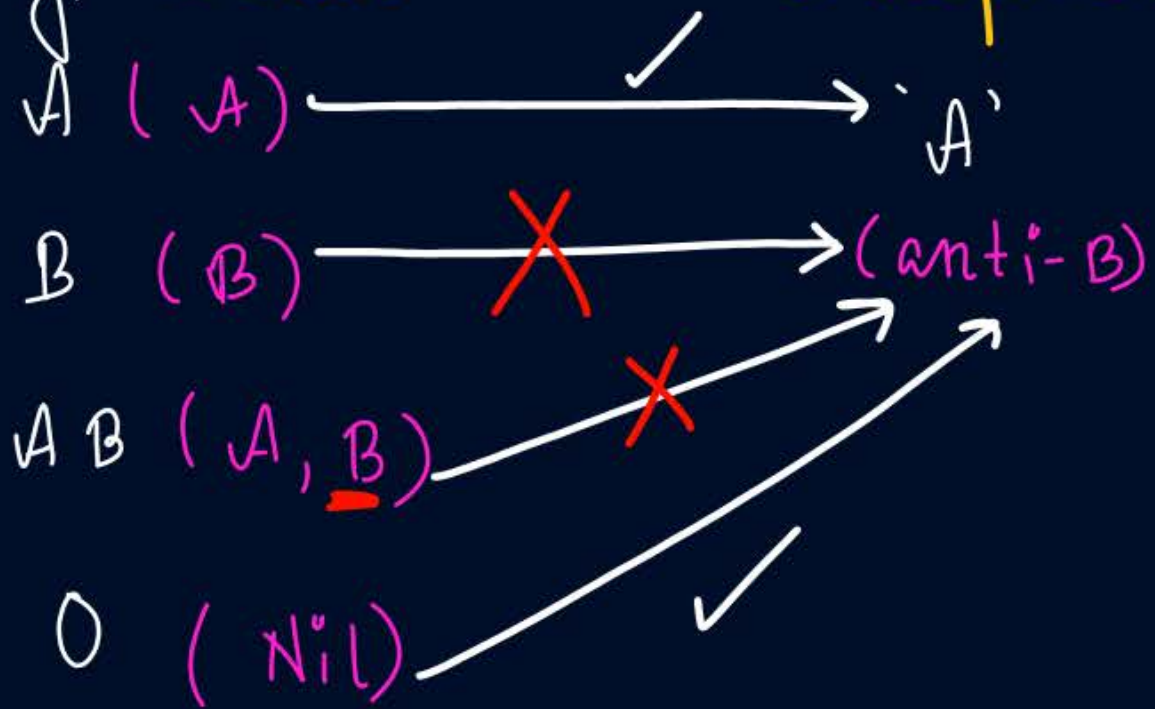
Blood Grp	Antigen on RBC	Ab' in Plasma	Donor
1. A	 A-antigen	anti-B (antibody against B)	A, O
2. B	 B-antigen	anti A	B, O
3. AB	 A-antigen B-antigen	Nil	A, AB, B, O
4. O	 Nil	anti A, anti B	O

Note

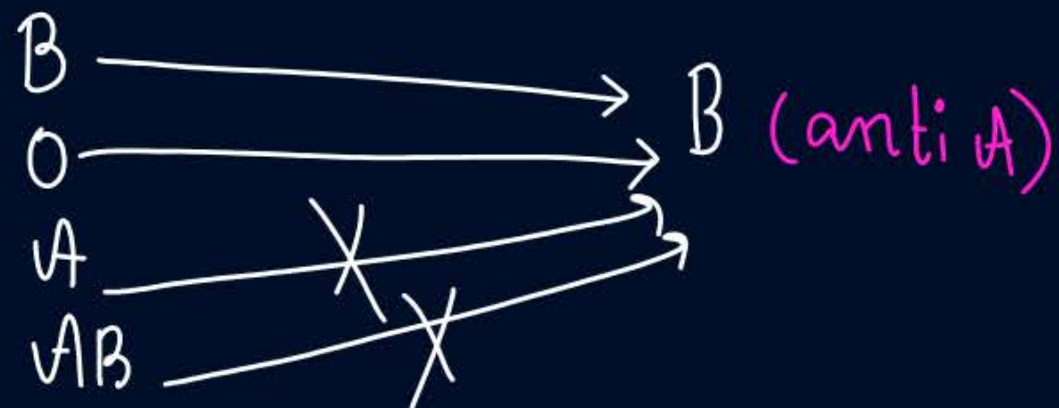


1. Antibodies for 'ABO' are naturally present in body.
2. How to know the Donor?

(Check Ag) **Donor** **Recipient** (Check 'Ab')



(If 'Ag' & 'Ab' matches) (CLUMPING)
 ↓
 'No donation'

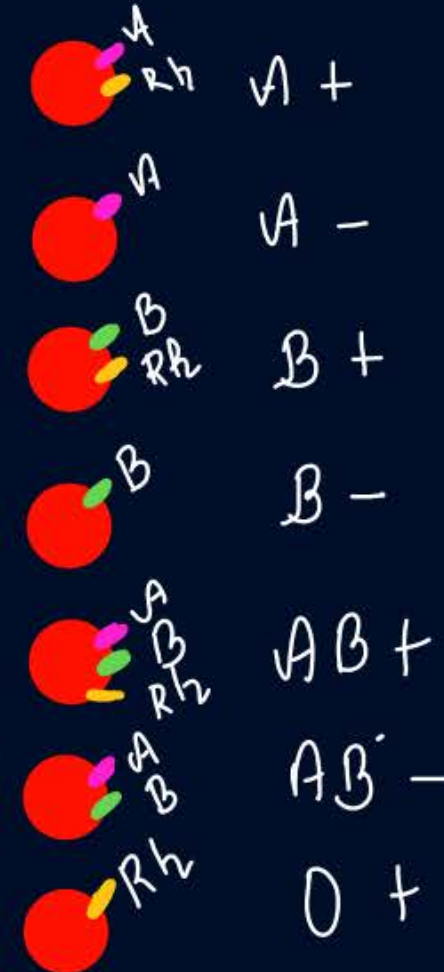
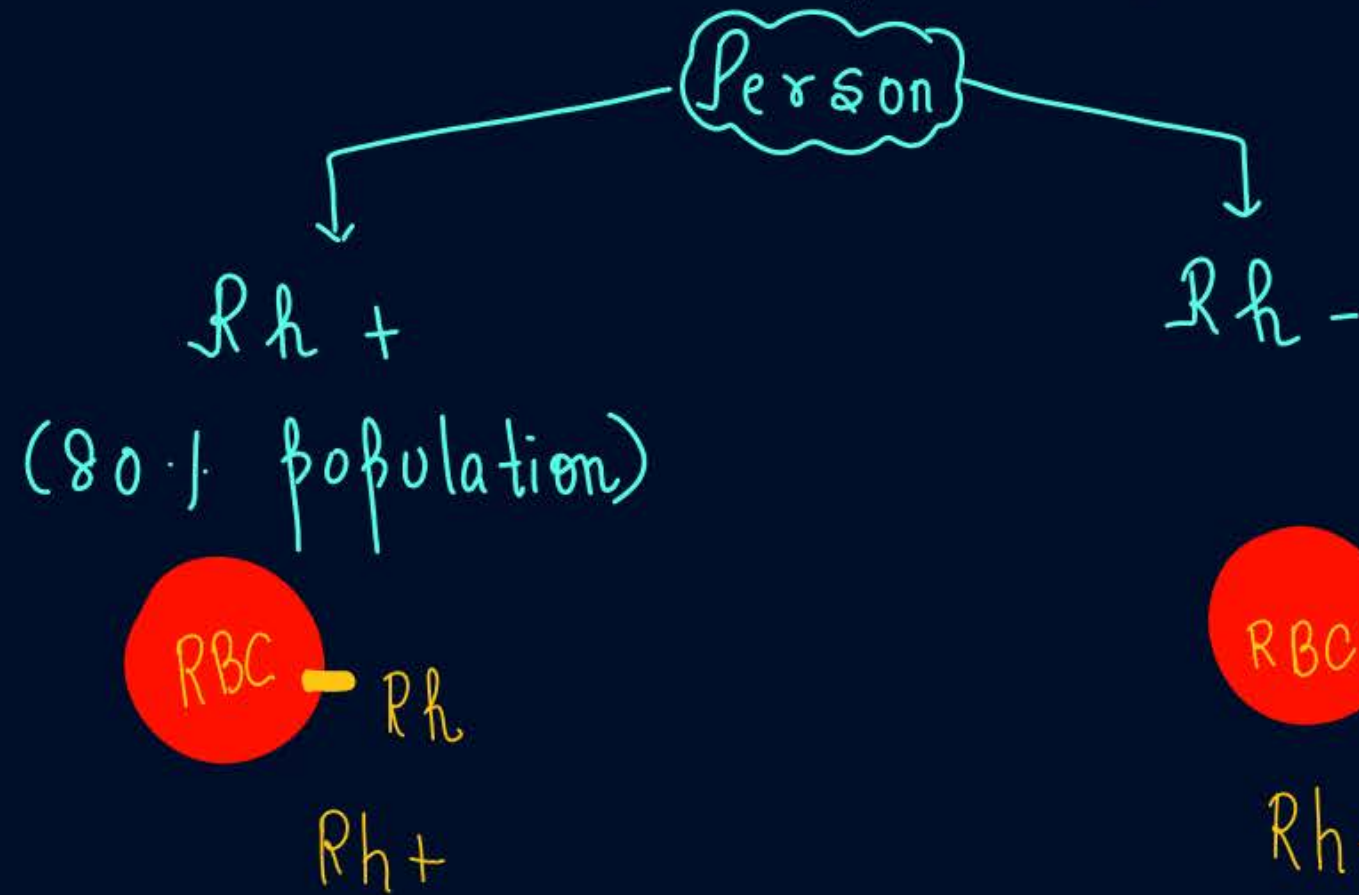


Note

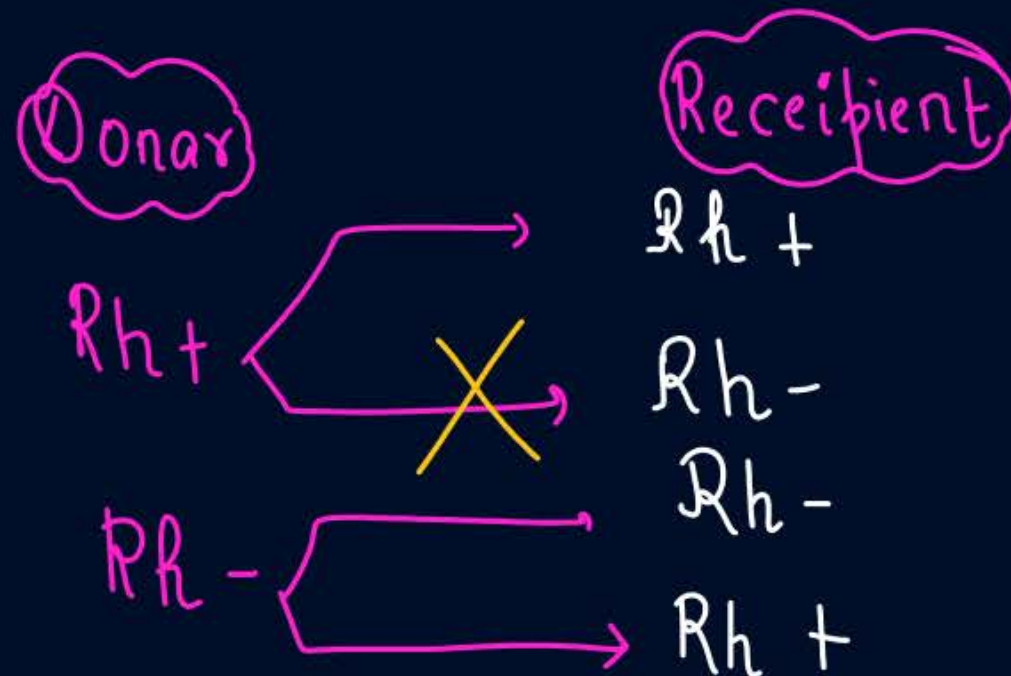
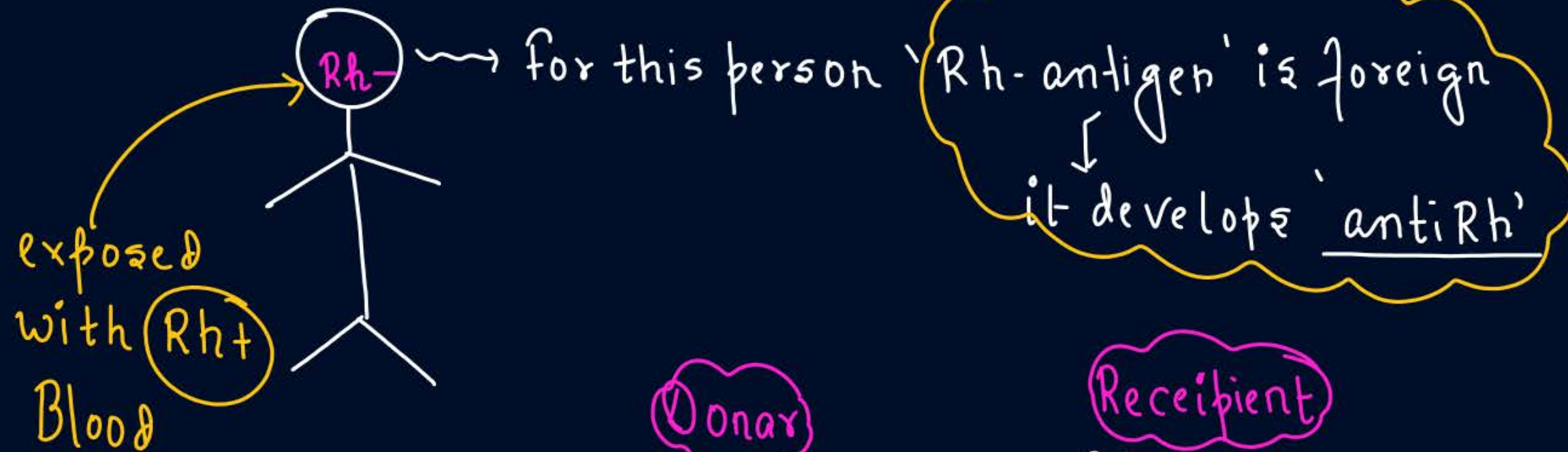
AB : Universal Recipient (No 'Ab' Plasma)

O : " Donor (No 'Ag' on RBC)

② Rh grouping: 'Rh' : Rhesus factor: Another surface 'Ag' found on RBC & the named so as similar factor found in 'Rhesus' Monkey.



Note 'Rh' antibodies (anti Rh) is not present naturally in plasma, a person develops anti Rh' (antibody against Rh) upon exposure with Rh antigen'



15.1.3 Blood Groups

As you know, blood of human beings differ in certain aspects though it appears to be similar. Various types of grouping of blood has been done. Two such groupings – the ABO and Rh – are widely used all over the world.

15.1.3.1 ABO grouping

ABO grouping is based on the presence or absence of two surface antigens (chemicals that can induce immune response) on the RBCs namely A and B. Similarly, the plasma of different individuals contain two natural antibodies (proteins produced in response to antigens). The distribution of antigens and antibodies in the four groups of blood, **A**, **B**, **AB** and **O** are given in Table 15.1. You probably know that during blood transfusion, any blood cannot be used; the blood of a donor has to be carefully matched with the blood of a recipient before any blood transfusion to avoid severe problems of clumping (destruction of RBC). The donor's compatibility is also shown in the Table 15.1.

TABLE 15.1 Blood Groups and Donor Compatibility

Blood Group	Antigens on RBCs	Antibodies in Plasma	Donor's Group
A	A	anti-B	A, O
B	B	anti-A	B, O
AB	A, B	nil	AB, A, B, O
O	nil	anti-A, B	O

From the above mentioned table it is evident that group 'O' blood can be donated to persons with any other blood group and hence 'O' group individuals are called 'universal donors'. Persons with 'AB' group can accept blood from persons with AB as well as the other groups of blood. Therefore, such persons are called 'universal recipients'.

Donor Recipient

15.1.3.2 Rh grouping

Another antigen, the Rh antigen similar to one present in Rhesus monkeys (hence Rh), is also observed on the surface of RBCs of majority (nearly 80 per cent) of humans. Such individuals are called **Rh positive** (Rh+ve) and those in whom this antigen is absent are called **Rh negative** (Rh-ve). An Rh-ve person, if exposed to Rh+ve blood, will form specific antibodies against the Rh antigens. Therefore, Rh group should also be matched before transfusions. A special case of Rh incompatibility (mismatching) has been observed between the Rh-ve blood of a pregnant mother with Rh+ve blood of the foetus. Rh antigens of the foetus do not get exposed to the Rh-ve blood of the mother in the first pregnancy as the two bloods are well separated by the placenta. However, during the delivery of the first child, there is a possibility of exposure of the maternal blood to small amounts of the Rh+ve blood from the foetus. In such cases, the mother starts preparing antibodies against Rh antigen in her blood. In case of her subsequent pregnancies, the Rh antibodies from the mother (Rh-ve) can leak into the blood of the foetus (Rh+ve) and destroy the foetal RBCs. This could be fatal to the foetus or could cause severe anaemia and jaundice to the baby. This condition is called *erythroblastosis foetalis*. This can be avoided by administering anti-Rh antibodies to the mother immediately after the delivery of the first child.

M / F +
(I)

• ERYTHROBLASTOSIS FOETALIS: A special case: 'Rh-incompatibility'

Mother (Rh-)
 (Foetus Rh+)
 1st Pregnancy

No Complication

Mother & foetal Blood well separated
by PLACENTA

During Delivery, Mother comes in contact
with Rh+ of Baby

Mother develops anti-Rh RBC

Mother (-), anti-Rh
foetus (Rh+)

2nd Pregnancy

Now, antiRh from mother, will cross
Placenta Barrier (since these are very small)

attack (Rh+) RBC of foetus

Destruction of foetal RBC

Erythroblastosis' also K/a Haemolytic Disease
of new Born



Note Bilirubin' &
Biliverdin': formed
from Hb': Haem of
destroyed RBCs.

↑ Bilirubin, Biliverdin: Jaundice

Severe Anaemia, Jaundice may develop, can also
be FATAL (जानलेवा)

Note

This can be prevented: by administering 'anti Rh' antibodies to Mother immediately after 1st delivery (Rhogam)

↓
these 'anti Rh' destroys Rh+ of 1st Baby that comes in contact with mother, so that mother does not generate any 'anti Rh' on its own as these will be stored as Memory.

Next Catalyst

Given below are two statements.

Statement I: Blood has plasma and formed elements. (T)

Statement II: Serum cannot clot. (T) $Q = P - CF$

In the light of the above statements, choose the most appropriate answer from the options given below.

- (1) Statement I is correct but Statement II is incorrect.
- (2) Statement I is incorrect but Statement II is correct.
- (3) Both Statement I and Statement II are correct.
- (4) Both Statement I and Statement II are incorrect.

Q1

(3)

Assertion(A): Serum cannot clot.

Reason (R): Serum lacks clotting factors.

- (1) Both Assertion (A) and Reason (R) are true, and Reason (R) is a correct explanation of Assertion (A).
- (2) Both Assertion (A) and Reason (R) are true, but Reason (R) is not a correct explanation of Assertion (A).
- (3) Assertion (A) is true, and Reason (R) is false.
- (4) Assertion (A) is false, and Reason (R) is true.

Q2
①

ASSERTION- fibrinogens, prothrombins are blood proteins present in plasma in the active state normally

inactive

F

REASON - fibrinogens are the Network of threads called the clot or coagulum

Fibrins

- A) Both Assertion (A) and Reason (R) are true, and Reason (R) is a correct explanation of Assertion (A).
- B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not a correct explanation of Assertion (A).
- C) Assertion (A) is true, and Reason (R) is false.
- D) Assertion (A) is false, and Reason (R) is false.

Q-3 (4)

QUESTION

_____ are formed by the conversion of inactive fibrinogens in the plasma by the enzyme thrombin.

Choose the option which fills the blank correctly.

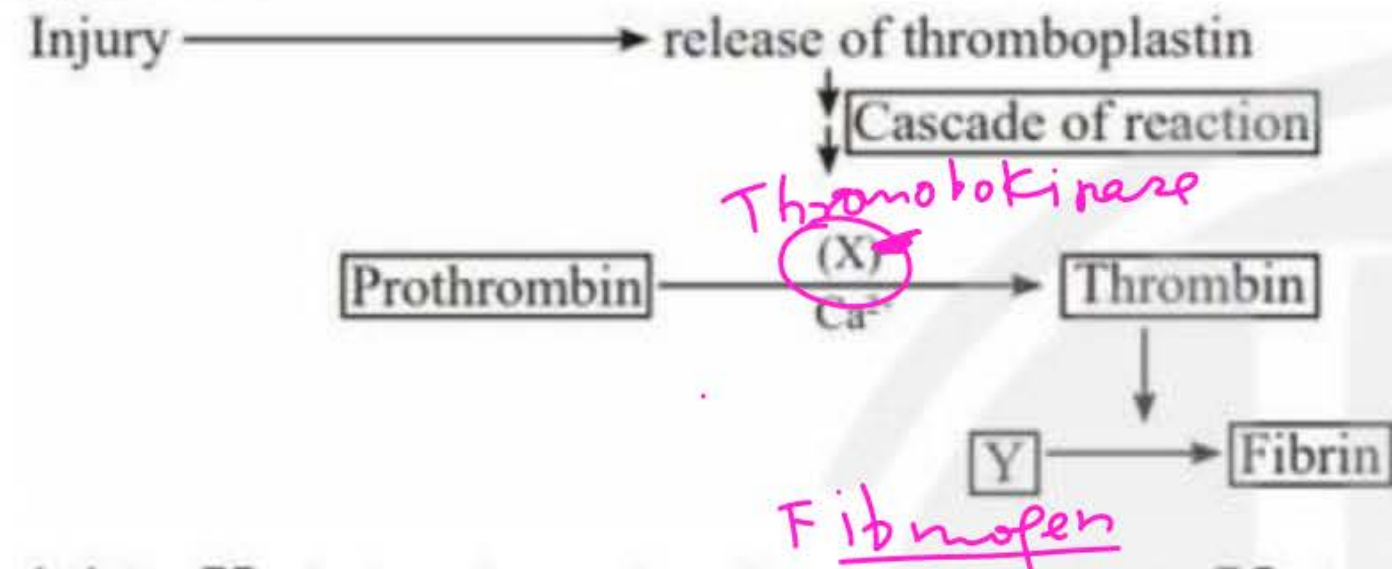
- 1 Heparin
- 2 Fibrin
- 3 Thrombokinese
- 4 Prothrombins

Fibrinogen → Fibrin

Q-4

(2)

The flow chart below explains the process of blood clotting and factors involved. Identify "X" and "Y".



- (A) 'X' is thromboplastase and 'Y' is fibrinogen.
- (B) 'X' is thrombokinese and 'Y' is heparin.
- (C) 'X' is serine protease and 'Y' is transglutaminase.
- ✓ (D) 'X' is thrombokinese and 'Y' is fibrinogen.

Q-5
4

ASSERTION- An injury causes initiation of blood coagulation (T) (T)
REASON - Injury stimulates the injured tissues and platelets in the blood to release certain factors which activate the mechanism of coagulation (T)

- A) Both Assertion (A) and Reason (R) are true, and Reason (R) is a correct explanation of Assertion (A). ✓
- B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not a correct explanation of Assertion (A).
- C) Assertion (A) is true, and Reason (R) is false.
- D) Assertion (A) is false, and Reason (R) is true.

Q.6 (A)

QUESTION

Given below are two statements.

Statement I: A dark reddish brown scum formed at the site of a cut or an injury over a period of time.

Statement II: It is a clot or coagulum formed mainly of a network of threads called fibrins in which the dead formed elements of blood are trapped.

In the light of the above statements, choose the most appropriate answer from the options given below.

- 1 Statement I is correct but Statement II is incorrect.
- 2 Statement I is incorrect but Statement II is correct.
- 3 Both Statement I and Statement II are correct.
- 4 Both Statement I and Statement II are incorrect.

Q.7 (3)

QUESTION

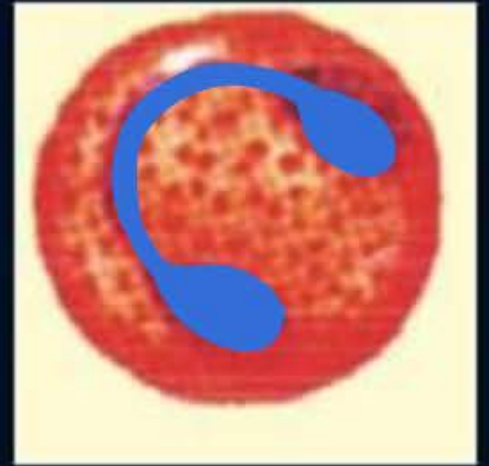
Identify the given diagram and choose the option with its correct function.

1 Neutrophil- destroy foreign organisms entering the body by phagocytosis.

2 Basophil- responsible for blood clotting.

3 Eosinophil- associated with allergic reactions.

4 RBC- transport of respiratory gases.



Q.8
3

Read the following statements.

Statement-I: Erythroblastosis foetalis generally occurs in the second pregnancy, the Rh antibodies from the mother (Rh^-) can leak into the blood of the foetus (Rh^+) and destroy the foetal RBCs.

Statement-II: This Rh incompatibility problem will not occur in the second pregnancy if the foetus is Rh^- .

Mark the correct choice as:

- (A) Both Statement-I and Statement-II are correct.
- (B) Both Statement-I and Statement-II are incorrect.
- (C) Statement-I is correct & Statement-II is incorrect.
- (D) Statement-I is incorrect & Statement-II is correct.

T

Q 9
1

Choose the correct statement.

I. A person of 'O' blood group has anti 'A' and anti 'B' antibodies in his blood plasma. (T)

II. A person of 'B' blood group can't donate blood to a person of 'A' blood group. (T)

III. Blood group is designated on the basis of the presence of antibodies in the blood plasma. X

IV. A person of AB blood group is universal recipient. (T)

V. Erythroblastosis foetalis can be avoided by administering anti-Rh antigen to the mother immediately after the delivery of the first child.

(A) I, II and III only

(B) I, II and IV only

(C) III, IV and V only

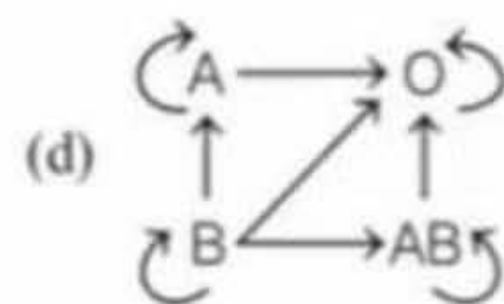
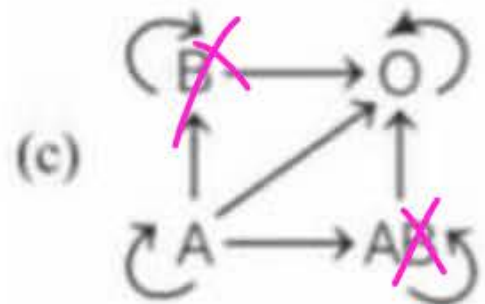
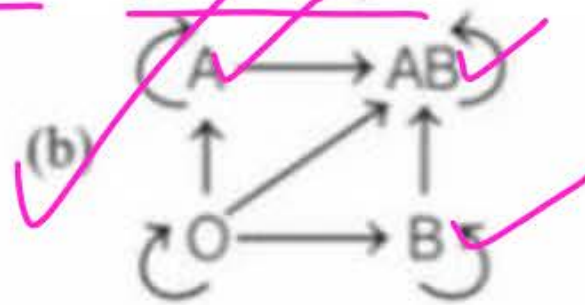
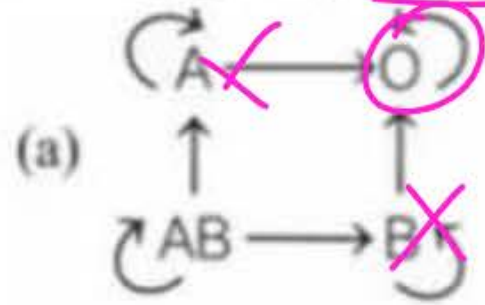
(D) I, II and V only

0

B B antigen \times anti B A receives

Q 10
B

Which of the given options is correct about blood groups and donor compatibility?



(A) (a)

(B) (b)

(C) (c)

(D) (d)

Q-11 (2)

A person suffers from slow, i.e., delayed blood clotting leading to excessive loss of blood from the body. Which of the following can be a probable reason for this?

- (A) Thrombocytosis (Abnormal ↑ in Blood P)
- (B) Thrombocytopenia
- (C) Defect in the synthesis of Castles intrinsic factor
- (D) Defective absorption and storage of folic acid

Q-12
B



Homework

- REVISE CLAASNOTES / ZOOLOGY MED EASY

Samapti Sinha Mahapatra

PW Zoology Med Easy For NEET and Board Exams 2024-25 | Flowcharts, Schematic Diagrams Samapti Sinha Mahapatra Handwritten Notes

20 May 2024

ISBN-13: 978-9360345068 ISBN-10: 9360345067

#1 Best Seller in AIIMS & NEET Exams

14% off



THANK
YOU