

Immunity

Question Paper 2

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Immunity
Sub Topic	
Booklet	Multiple Choice
Paper Type	Question Paper 2

Time Allowed : 54 minutes

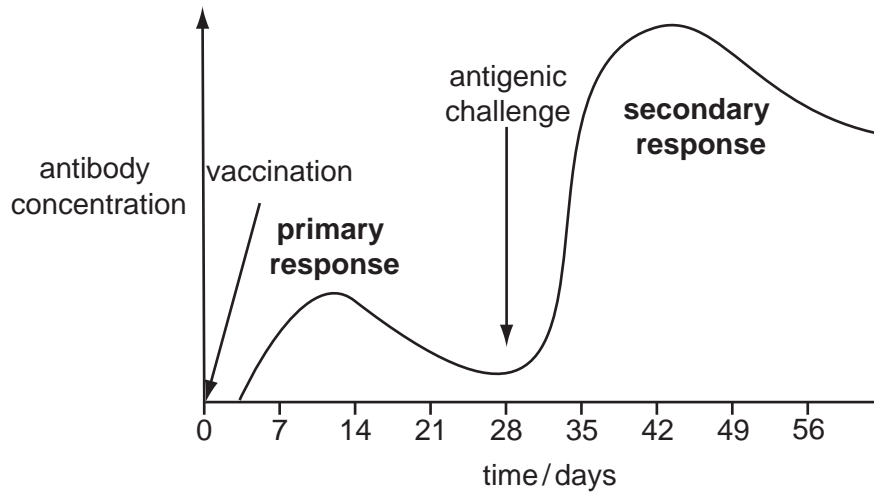
Score : / 45

Percentage : /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

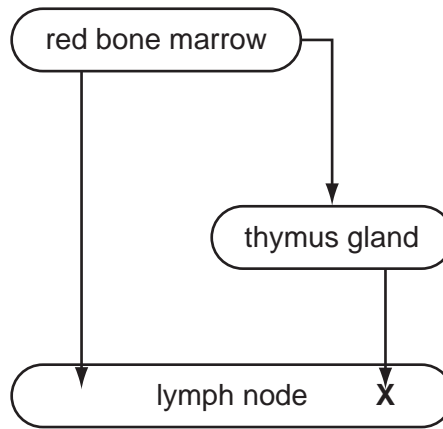
- 1 The graph shows the level of antibody in serum following vaccination and a challenge with the same antigen 28 days later.



Which cells account for the difference in antibody concentration at the peaks of the primary and secondary responses?

- A B-lymphocytes
- B memory cells
- C phagocytes
- D T-lymphocytes

- 2 The diagram shows the relationship between the red bone marrow, the thymus gland and the lymph nodes.



What does **X** represent?

- A antibodies
- B B-lymphocytes
- C macrophages
- D T-lymphocytes

- 3 A person's blood group is determined by antigens present on the red blood cells. People have antibodies in their plasma even if they have never received a blood transfusion. It is these antibodies in the plasma of the person who receives the blood that make some blood transfusions unsafe.

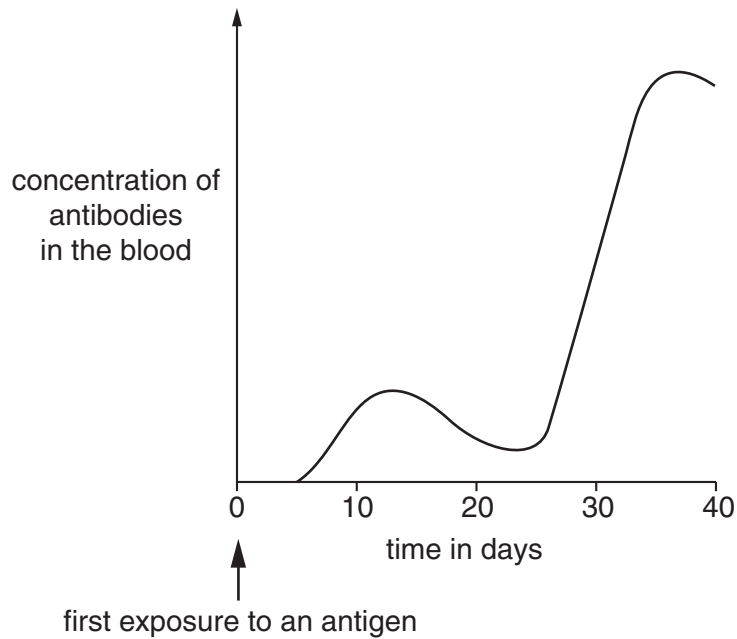
The table shows the antigens and antibodies in the blood of people with different blood groups.

blood group	antigens on red blood cells	antibodies in plasma
A	A	antibodies to B
B	B	antibodies to A
AB	A and B	neither
O	neither	antibodies to A and B

People with which blood groups can safely receive a transfusion of group A blood?

- A A and B
 - B A and AB
 - C A, B and AB
 - D A and O
- 4 What is the immune system's first line of defence against invading microorganisms?
- A ingestion of the microorganisms by B-lymphocytes
 - B ingestion of the microorganisms by phagocytes
 - C production of antibodies
 - D production of antigens

- 5 The graph shows the amount of antibody produced in response to an antigen.



From the graph, which statement is correct?

- A It takes 25 days to achieve active immunity.
 - B Memory cells for this antigen are present in the body within 20 days.
 - C A second exposure to the antigen occurred on day 20.
 - D T helper cells are activated on day 12.
- 6 For a period after its birth, a human baby is immune to most of the diseases to which its mother is immune.

Which form of immunity does this represent?

- A artificial active
- B artificial passive
- C natural active
- D natural passive

7 Which are specific immune responses?

- 1 phagocytosis
- 2 production of antibodies
- 3 effect of histamine

A 1 only **B** 2 only **C** 1 and 3 only **D** 2 and 3 only

8 Why has vaccination failed to eradicate cholera?

- A** The pathogen exists in many strains which mutate.
- B** The pathogen is present in the lumen of the gut.
- C** The pathogen is waterborne.
- D** There is a stage of the life cycle in other mammals.

9 The statements refer to polio and tuberculosis (TB).

- 1 Macrophages present antigens in vaccines to stimulate an immune response.
- 2 The TB antigens necessary to produce an immune response are proteins which would be digested in the stomach and small intestine.
- 3 There are no B-lymphocytes and T-lymphocytes in the stomach.

Which explains why polio vaccine can be taken by mouth but TB vaccine has to be injected?

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 only

10 Which explains why sickle cell anaemia has not been eradicated?

- A** Identification of carriers is too difficult as they show no symptoms.
- B** Sickle cell anaemia gives the individual some resistance against malaria.
- C** Sickle cell anaemia is an inherited disease, so vaccination is not possible.
- D** The gene responsible for sickle cell anaemia has a high rate of mutation.

11 Which method of gaining immunity can be described as natural active immunity?

- A feeding on colostrum
- B inhaling the chicken pox virus
- C injection with antibodies
- D through the placenta

12 Which statements explain why cholera has **not** been eradicated by vaccination?

- 1 Cholera is caused by the bacterium *Vibrio cholerae*.
- 2 Many people can have the disease, but show no symptoms.
- 3 People are mobile due to global trade and tourism.
- 4 The cholera pathogens target cells in the small intestine.

- A 1, 2, 3 and 4
- B 1 and 2 only
- C 2 and 4 only
- D 3 and 4 only

13 Which type of immunity occurs following infection by a pathogen?

	natural	artificial
active	A	B
passive	C	D

14 A student wrote down three statements about antibodies.

- 1 Their structure depends on peptide, hydrogen and disulfide bonds.
- 2 They are protein molecules with both tertiary and quaternary structure.
- 3 Four polypeptides provide four antigen binding sites.

Which statements are true?

- A** 1, 2 and 3
- B** 1 and 2 only
- C** 1 and 3 only
- D** 2 and 3 only

15 New-born babies have natural passive immunity.

What is the correct explanation for this?

	immunity is not inherited	antibodies are broken down
A	x	✓
B	x	x
C	✓	✓
D	✓	x

key
 ✓ = correct
 x = not correct

16 Which is a correct description of different types of immunity?

	natural active	natural passive	artificial active	artificial passive
A	antibodies cross the placenta	injection of antigens	injection of antibodies	no memory cells form
B	memory cells form	antibodies cross the placenta	injection of antigens	injection of antibodies
C	injection of antibodies	memory cells form	antibodies cross the placenta	injection of antigens
D	injection of antigens	injection of antibodies	no memory cells form	antibodies cross the placenta

- 17 The World Health Organization (WHO) set a target to eradicate polio, using vaccination, by the year 2000. However, cases are still being reported in some parts of the world after this date.

What explains these new cases of polio?

- 1 Some parts of countries are difficult to reach because of poor transport or wars.
- 2 There is not enough research to develop more effective vaccines.
- 3 Records of vaccinated and unvaccinated people are incomplete.

A 1 only **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

- 18 What are the function(s) of plasma cells during an immune response?

- 1 destroy cancer cells
- 2 differentiate into memory cells
- 3 secrete antibodies

A 2 only
B 3 only
C 2 and 3 only
D 1,2 and 3

- 19 Some of the facts about a pathogen, P, are that:

- 1 it is transmitted in food and water
- 2 it lives in human intestines
- 3 it has many genes coding for surface proteins
- 4 it changes its surface antigens
- 5 it may or may not trigger an immune response.

Which explains why it is difficult to develop an effective vaccine for P?

A P can mutate to produce different antigens.
B P is a eukaryotic cell with many genes.
C P is found in contaminated food and water and affects the gut.
D People can be infected with P and may not show symptoms.

- 20 Some children are born with Severe Combined Immune Deficiency (SCID). These children do not normally have any T-lymphocytes and suffer from many diseases.

How may these children be cured?

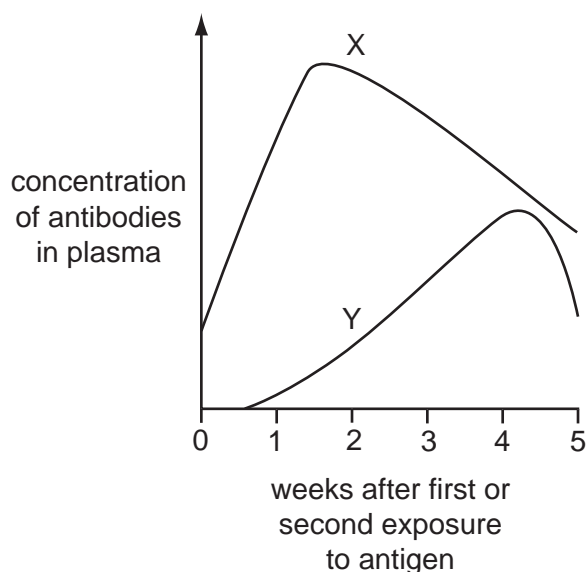
- A** bone marrow transplantation
 - B** continual use of antibiotics
 - C** transfusion of antibodies
 - D** vaccination against all diseases
- 21 Which of the following increase the risk of contracting TB?
- 1 drinking unpasteurised milk
 - 2 eating shellfish which have fed on raw sewage
 - 3 living in overcrowded conditions
- A** 2 only
 - B** 1 and 2
 - C** 1 and 3
 - D** 2 and 3

22 To prevent a disease, dead bacteria may be injected into the body.

What type of immune response is produced?

	natural	active
A	no	no
B	no	yes
C	yes	no
D	yes	yes

23 The graph shows the primary and secondary responses of the immune system to antigens.



What are responses X and Y?

	X	Y
A	primary response	secondary response caused by cloning of B-lymphocytes formed during the primary response
B	primary response	secondary response caused by cloning of T-lymphocytes formed during the primary response
C	secondary response caused by cloning of B-lymphocytes formed during the primary response	primary response
D	secondary response caused by cloning of T-lymphocytes formed during the primary response	primary response

24 A child is vaccinated against a viral disease. A few weeks later she is exposed to the same virus.

What is the expected response to this exposure?

- A increased numbers of B-lymphocytes
- B increased numbers of T-lymphocytes
- C large numbers of antibodies are released
- D large numbers of antigens are released

25 Which statement describes a role of lymphocytes in the immune response?

- A B-lymphocytes divide to produce killer lymphocytes.
- B B-lymphocytes produce memory cells.
- C T-lymphocytes are involved in the humoral response.
- D T-lymphocytes clone producing antibody-secreting cells.

26 Where are antibodies and antigens found?

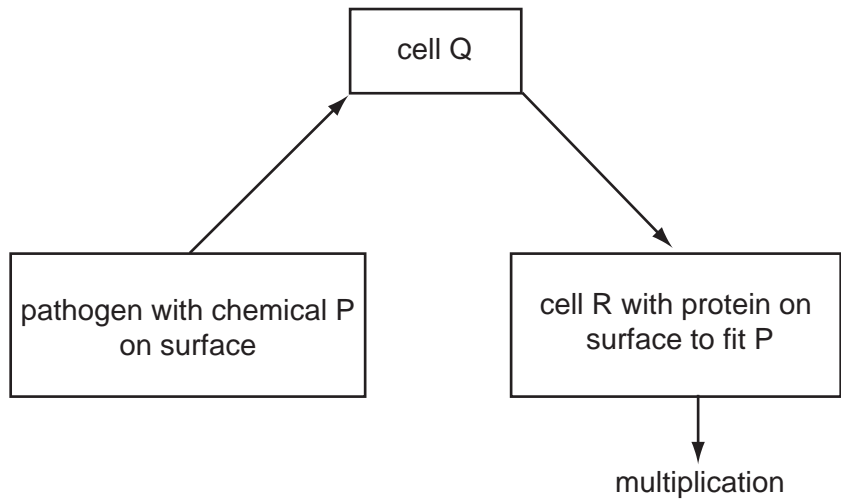
	on surface of pathogens	on surface of phagocytes	in blood plasma
A	antibodies	antibodies	antigens
B	antibodies	antigens	antibodies
C	antigens	antibodies	antigens
D	antigens	antigens	antibodies

27 What could cause an outbreak of malaria in a country where it had been eliminated?

- 1 mosquitoes became resistant to insecticides
- 2 migration of population due to war
- 3 malarial parasites became resistant to quinine

A 1 and 2 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2 and 3

28 The diagram shows part of the immune response.



What are P, Q and R?

	P	Q	R
A	antibody	B-lymphocyte	T helper cell
B	antibody	T helper cell	B-lymphocy
C	antigen	B-lymphocy	T helper cell
D	antigen	T helper cell	B-lymphocy

29 When a body cell is infected by a pathogen, which describes a correct immune response?

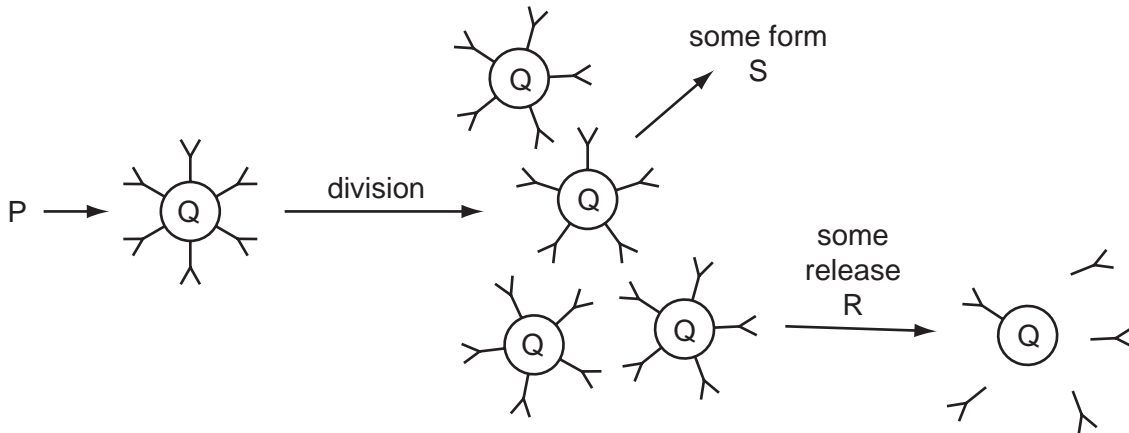
- A Killer T cells punch holes in infected cells, releasing antibodies.
- B Killer T cells release cytokines, infected body cells release antibodies.
- C Memory cells release antibodies, killer T cells secrete cytokines.
- D T helper cells release cytokines, plasma cells release antibodies.

30 An enzyme hydrolyses the two heavy polypeptide chains of an antibody molecule. The hydrolysis occurs at the hinge region and breaks the antibody into three fragments.

How many of these fragments are able to bind to antigens?

- A 0
- B 1
- C 2
- D 3

31 The diagram shows the response to a pathogen by the immune system.



Which row correctly identifies P, Q, R and S?

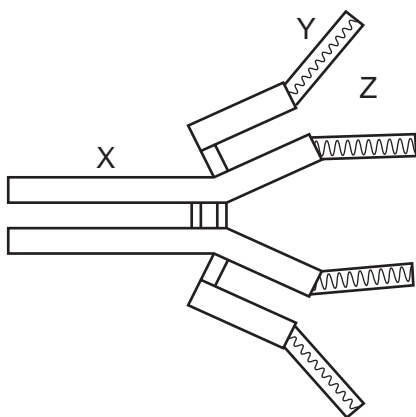
	P	Q	R	S
A	antibody	T-lymphocyte	antigen	plasma cell
B	antigen	B-lymphocyte	antibody	memory cell
C	antigen	T-lymphocyte	antitoxin	B-lymphocyte
D	bacteria	B-lymphocyte	antibody	T-lymphocyte

32 After an immune response, memory cells remain in the blood for a long time.

What is the function of memory cells?

- A They can ingest invading bacteria.
- B They contain lots of antibodies.
- C They divide to make plasma cells.
- D They kill cells infected with virus.

33 The diagram represents the structure of a molecule of antibody.



Which arrangement of labels X, Y and Z correctly identifies its different parts?

	X	Y	Z
A	antigen binding site	constant region	variable region
B	constant region	antigen binding site	variable region
C	constant region	variable region	antigen binding site
D	variable region	antigen binding site	constant region

34 Which examples show the different types of immunity?

	active artificial	passive natural
A	immunity to measles after infection	receiving antibodies to measles in colostrum
B	immunity to measles after infection	receiving antibodies to tetanus by injection
C	immunity to smallpox after vaccination	receiving antibodies to measles in colostrum
D	immunity to smallpox after vaccination	receiving antibodies to tetanus by injection

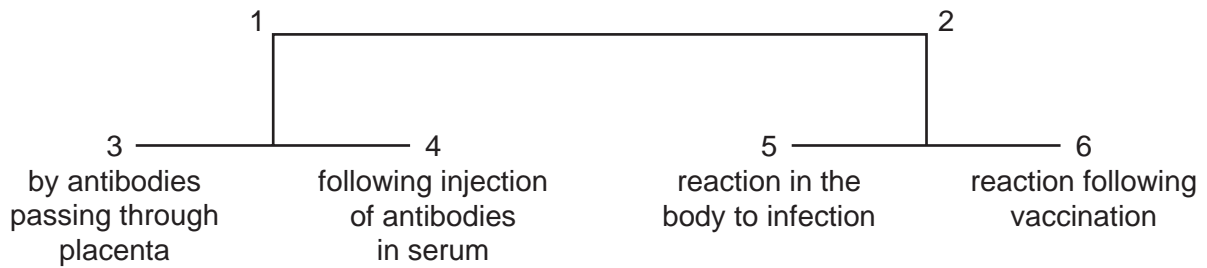
35 Which diseases can be cured by the use of antibiotics?

- A** cholera and tuberculosis
- B** HIV/AIDS and smallpox
- C** HIV/AIDS and tuberculosis
- D** smallpox and cholera

36 Where are antibodies and antigens found?

	on surface of pathogen	on surface of macrophage	in blood plasma
A	antibody	antibody	antigen
B	antibody	antigen	antibody
C	antigen	antibody	antigen
D	antigen	antigen	antibody

37 The numbers on the diagram refer to different types of immunity.



Which term is correct for each of these numbers?

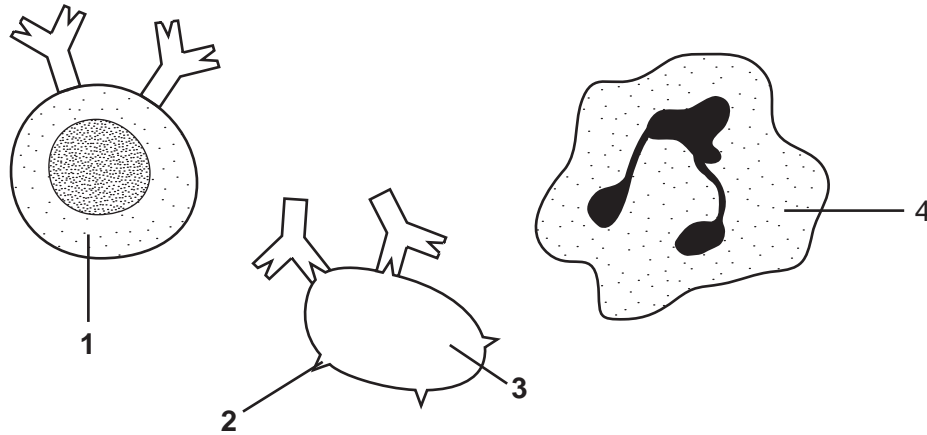
	1	2	3	4	5	6
A	active	passive	natural	artificial	natural	artificial
B	active	passive	artificial	natural	artificial	natural
C	passive	active	natural	artificial	natural	artificial
D	passive	active	artificial	natural	artificial	natural

38 An antiserum to a snake toxin can be obtained by injecting the toxin into a horse. The antiserum is made from plasma taken from the horse a few weeks later. The antiserum is used to treat a person who has been bitten by the same species of snake.

What does the person's treatment bring about?

- A** artificial active immunity
- B** artificial passive immunity
- C** natural active immunity
- D** natural passive immunity

39 The diagram shows different elements concerned with the immune response in humans.



What are the parts numbered 1 to 4?

	1	2	3	4
A	lymphocyte	antigen	pathogen	phagocyte
B	phagocyte	antibody	pathogen	lymphocyte
C	phagocyte	antibody	lymphocyte	pathogen
D	pathogen	antigen	lymphocyte	phagocyte

40 What are the pathogens responsible for cholera, malaria and TB?

	cholera	malaria	TB
A	bacterium	bacterium	virus
B	bacterium	eukaryotic parasite	bacterium
C	eukaryotic parasite	virus	bacterium
D	virus	eukaryotic parasite	virus

41 For which disease is vaccination the most successful method of prevention?

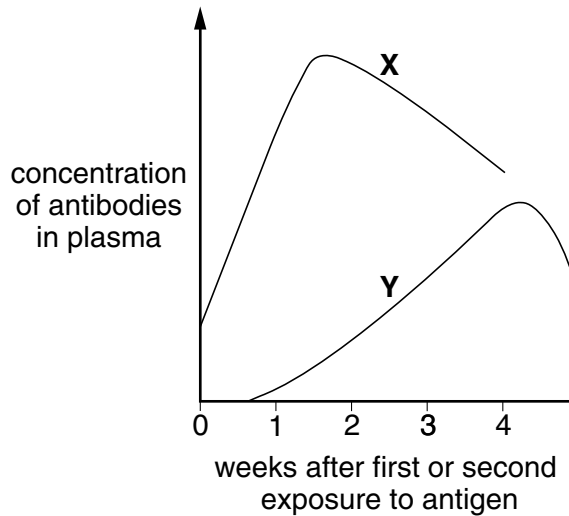
- A** cholera
- B** HIV / AIDS
- C** TB
- D** malaria

42 Immune responses may be specific or non-specific.

Which response is a specific immune response?

- A inflammation
- B phagocytosis
- C production of antibodies
- D release of histamine

43 The graph shows the primary and secondary responses of the immune system to antigens.



What are responses X and Y?

	X	Y
A	primary response	secondary response caused by cloning of B cells formed during the primary response
B	primary response	secondary response caused by cloning of T cells formed during the primary response
C	secondary response caused by cloning of B cells formed during the primary response	primary response
D	secondary response caused by cloning of T cells formed during the primary response	primary response

44 The first breast milk produced by the mother for a new-born baby contains antibodies.

What do these antibodies provide?

- A artificial active immunity
- B artificial passive immunity
- C natural active immunity
- D natural passive immunity

45 Where are antibodies and antigens found?

	on surface of pathogen	on surface of macrophage	in blood plasma
A	antibody	antibody	antigen
B	antibody	antigen	antibody
C	antigen	antibody	antigen
D	antigen	antigen	antibody