11.2 Antibodies & Vaccination

Question Paper

Course	CIE A Level Biology (9700) exams from 2022
Section	11. Immunity
Topic	11.2 Antibodies & Vaccination
Difficulty	Medium

Time allowed: **10**

Score: **/10**

Percentage: **/100**

Question 1

The following statements are about the defence of the body to infectious disease.

Which statement is incorrect?

A Lysosomes fuse with vacuoles that have been formed by phagocytes and which contain invading microorganisms.

B Following invasion by microorganisms, natural active immunity can be gained by initiating an immune response.

C A specific immune response involves activation of T-lymphocytes and B-lymphocytes following recognition of, and binding to, a specific antigen.

D Antibodies against specific antigens are produced by plasma cells in passive immunity, but the protection is short-lived as no memory cells are produced.

[1 mark]

Question 2

Antiserums to a toxin can be produced by injecting toxins into a horse. The blood plasma is then taken from the horse a few weeks later. The antiserum can then be injected to a person that has been bitten and infected with the same toxin.

What type of immunity would this be?

A natural passive

B natural active

C artificial active

D artificial passive

[1 mark]

Question 3

The following statements were written by a student about antibodies.

1 They are protein molecules with both tertiary and quaternary structures.

2 Four polypeptides provide four antigen-binding sites.

3 Their structure depends on peptide, hydrogen and disulfide bonds.

Which statements are true?

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

[1 mark]

Question 4

The following statements are facts about a pathogen Q:

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 statement explains why it is difficult to develop an effective vaccine for Q?

A People can be infected with Q and may not show symptoms.

B Q is found in contaminated food and water and affects the gut.

C Q is a eukaryotic cell with many genes.

D Q can mutate to produce different antigens.

[1 mark]

Question 5

The polypeptide chains of an antibody molecule can be hydrolysed by an enzyme. This happens at the hinge region and breaks the antibody into three fragments.

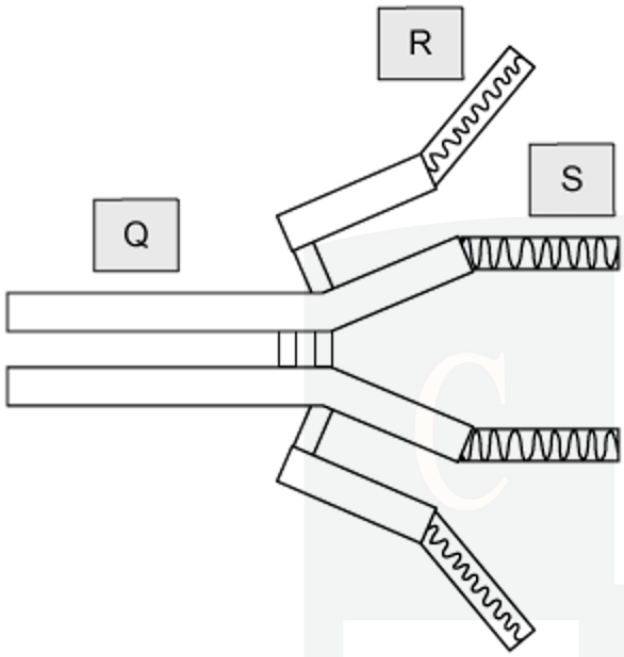
How many of these fragments are able to bind to antigens?

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

[1 mark]

Question 6

The diagram below represents the structure of an antibody.



Which row of the table correctly identifies the parts **Q**, **R** and **S** of the antibody?

	Q	R	S
A	constant region	variable region	antigen binding site
B	antigen binding site	variable region	constant region
C	antigen binding site	constant region	variable region
D	constant region	antigen binding site	variable region

[1 mark]

Question 7

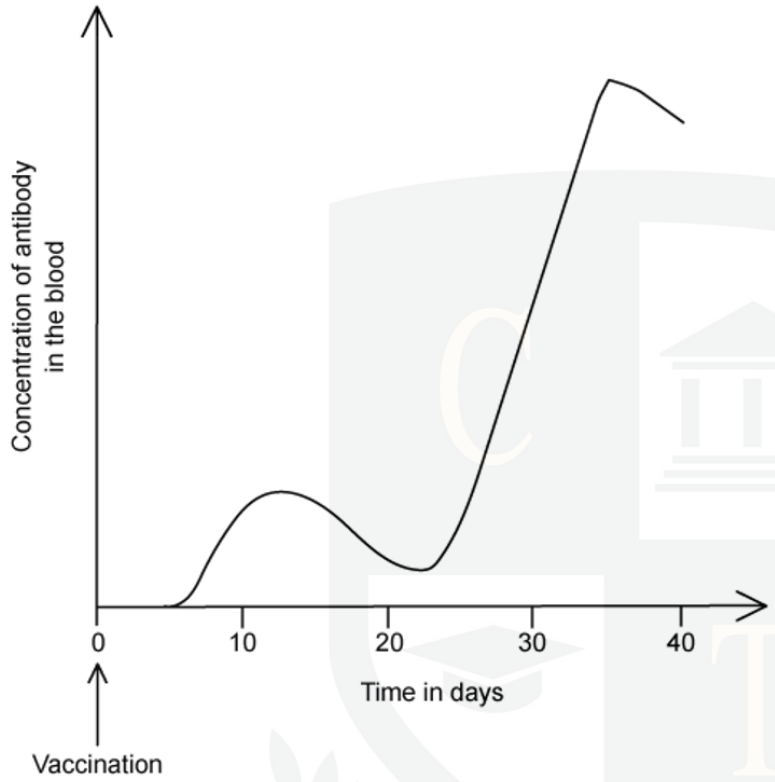
Which of the examples in the table below correctly demonstrates the different types of immunity?

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

[1 mark]

Question 8

The amount of antibody produced in response to an antigen in a vaccine is shown in the graph below.



Which statement about the graph is correct?

A The second exposure to the antigen occurred at 25 days.

B T-helper lymphocytes are activated on day 12.

C Memory cells for this antigen are present in the body within 20 days.

D It takes 25 days to achieve active immunity.

[1 mark]

Question 9

The following statements describe possible methods for the production of a hybridoma.

Which statement is correct?

A fusing T-helper cells with myeloma cells

B fusing B memory cells with myeloma cells

C fusing T cells with myeloma cells

D fusing B cells with myeloma cells

[1 mark]

Question 10

Antibody molecules have antigen-binding sites.

Which of the following is a correct statement about the properties of these binding sites?

A They have variable amino acid sequences for different antigens.

B They have binding sites for receptors on phagocytes.

C They have a hinge region to give flexibility for different antigens.

D They are located on the light chains only.

[1 mark]