

# 11.1 Antibody Production & Vaccination

## Question Paper

Course	DP IB Biology
Section	11. Animal Physiology (HL Only)
Topic	11.1 Antibody Production & Vaccination
Difficulty	Medium

**Time allowed:** 20  
**Score:** /10  
**Percentage:** /100

### Question 1

Which of the following statements are true for antigens?

- I. Antigens are proteins, glycolipids or glycoproteins found on the surface of the cell membrane
- II. The symptoms of allergies, such as a runny nose or itchy eyes, are **directly** caused by antigens
- III. Blood cells have antigens which determine blood type

- A. All of the above
- B. I and II only
- C. I and III only
- D. II only

[1 mark]

### Question 2

Identify which of the combinations of blood types are compatible for a blood transfusion from donor to recipient.

	Donor	Recipient
A	A	B
B	AB	B
C	O	AB
D	A	O

[1 mark]

### Question 3

What is required to initiate a specific immune response?

- A. Phagocytes engulf pathogens
- B. T-helper cells are activated
- C. B-cells mature
- D. Signalling proteins are released

[1 mark]

### Question 4

Which of the following statements about plasma cells is incorrect?

- A. Plasma cells contain large amounts of rough endoplasmic reticulum
- B. Plasma cells originate from B-cells
- C. Plasma cells divide by mitosis to produce memory cells
- D. Plasma cells produce specific antibodies

[1 mark]

### Question 5

Which of the following describes opsonisation?

- A. Antigens bind to receptors which activate complement proteins
- B. Antibodies attach to pathogens to reduce activity
- C. Antigen-antibody complexes form causing clumping together of pathogens
- D. Antibodies bind to receptors making the pathogen identifiable to phagocytes

[1 mark]

### Question 6

Edward Jenner carried out a controversial procedure whilst developing a vaccination for smallpox in the 1700s.

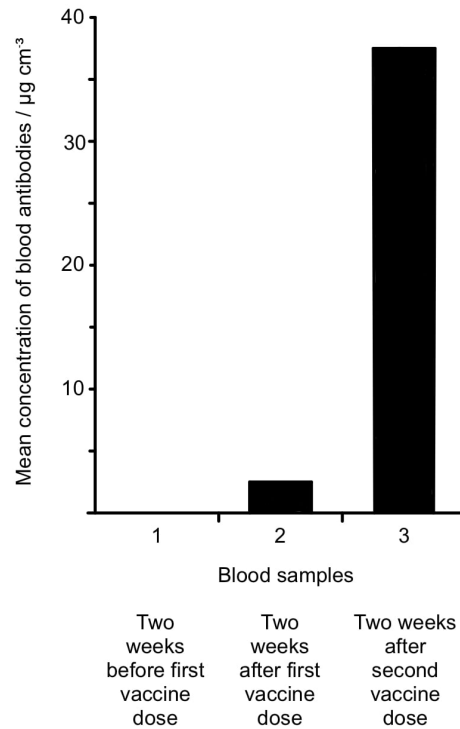
Which of the following statements best describes the ethical issues which made Jenners investigations so controversial?

- A. Milkmaids were exposed to cowpox without any protective measures
- B. Variolation was used by doctors to initiate an immune response
- C. His methods were not approved by the Research Ethics Committee
- D. Jenner's first patient was a child

[1 mark]

### Question 7

The graph below shows the number of antibodies in the blood of patients before vaccination, after one dose of vaccine, and again after two doses.



Which of the following is **not** associated with the response seen after the second dose of vaccine?

- A. Clonal selection
- B. Production of memory cells
- C. Production of histamines
- D. Activation of T-helper cells

[1 mark]

### Question 8

Which is the correct sequence of events in an allergic reaction?

- I. Mast cells and basophils are activated
- II. IgE antibodies are released
- III. Allergens trigger a specific immune response by activating B-cells
- IV. Histamines are produced
- V. Blood vessels dilate

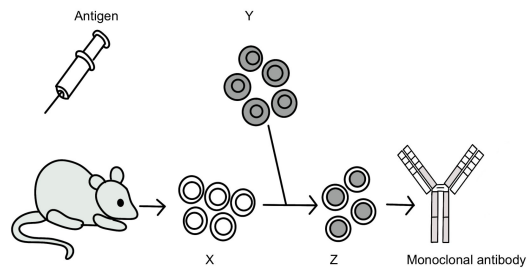
- A. I → II → III → IV → V
- B. III → II → I → IV → V
- C. III → IV → I → II → V
- D. V → III → II → I → IV

[1 mark]

### Question 9

The diagram shows a procedure used to create monoclonal antibodies.

Identify the correct labels for X, Y, and Z to complete the process.



	X	Y	Z
A	Hybridoma	Tumour cells	B-lymphocytes
B	Hybridoma	T-lymphocytes	Tumour cells
C	B-lymphocytes	Hybridoma	Myeloma
D	B-lymphocytes	Myeloma cells	Hybridoma

[1 mark]

**Question 10**

Which words or phrases can be used to fill spaces (I) and (II) in the following sentence?

Scientists have particular concerns about the spread of diseases in animals that may result in .....(I)..... transfer of pathogens to humans. ....(II)..... help to develop an understanding of the spread of disease in particular geographical areas and allow specific targeting where there are outbreaks.

	I	II
<b>A</b>	Zoonotic	Epidemiological studies
<b>B</b>	Species-specific	Epidemiological studies
<b>C</b>	Zoonotic	Vaccination programs
<b>D</b>	Mutated	Vaccination programs

[1 mark]