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## BIOLOGY VCE UNITS 3&4 DIAGNOSTIC TOPIC TESTS 2017

### TEST 5: RESPONDING TO ANTIGENS

TOTAL 40 MARKS (45 MINUTES)

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Student's Name: \_\_\_\_\_ Teacher's Name: \_\_\_\_\_

#### Directions to students

Write your name and your teacher's name in the spaces provided above.  
Answer all questions in the spaces provided.

#### SECTION A – MULTIPLE-CHOICE QUESTIONS

##### Instructions for Section A

Choose the response that is **correct** or that **best answers** the question.  
A correct answer scores 1; an incorrect answer scores 0.  
Marks will **not** be deducted for incorrect answers.  
No marks will be given if more than one answer is completed for any question.  
Unless otherwise indicated, the diagrams in this booklet are **not** drawn to scale.

#### Question 1

What part of the immune system distinguishes self from non-self?

- A. major histocompatibility markers (MHC)
- B. antigens
- C. leukocytes
- D. B cells only

#### Question 2

Why is a second injection of antigen given during a routine vaccination program?

- A. In case the first injection had attenuated antigens.
- B. In order to boost the immune response for long term protection.
- C. In order to produce helper T memory cells.
- D. The primary antibody response is greater than the secondary.

**Question 3**

Mast and basophil cells

- A. are involved in the allergic response to foreign particles.
- B. use immunoglobulin A (IgA) antibodies to bind to foreign particles.
- C. release chemicals that reduce inflammation.
- D. are responsible for the relaxation of smooth muscles.

**Question 4**

Complement proteins

- A. can coat and lyse bacteria ready for phagocyte ingestion.
- B. are secreted by some cells when they are infected by virus particles.
- C. are produced by none of the immune system cells.
- D. kill body cells that have been infected by virus particles.

**Question 5**

Which of the following is a reason for lymph nodes swelling?

- A. cancer cells
- B. when bacterial cells are ingested by macrophages
- C. when T and B memory cells in particular rapidly undergo mitosis in the presence of foreign antigens
- D. all of the above

**Question 6**

Which of the following outlines the function of dendritic cells?

- A. form an important role as an antigen presenting cell
- B. communicate with foreign particle's MHC
- C. communicate with accessory cells
- D. all of the above

**Question 7**

Humoral immunity

- A. is an immune response that does not involve antibodies.
- B. involves the activation of phagocytes and antigen-specific cytotoxic T lymphocytes.
- C. includes the release of various cytokines in response to an antigen.
- D. involves B cells that recognise antigens or pathogens that are circulating in the lymph or blood.

**Question 8**

Suppressor T cells

- A. act as an infection recedes.
- B. recognise class II antigens and stimulate B cells.
- C. secrete a protein that stimulates other T cells and B cells.
- D. assist in the reproduction of B cells and plasma cells.

**Question 9**

Basophils

- A. cannot perform phagocytosis.
- B. help in blood clotting.
- C. produce histamine that induces inflammation.
- D. are the most abundant type of granulocyte.

**Question 10**

If an infection occurs and elicits an immune response with no disease, the patient has a/an

- A. acute infection.
- B. sub-clinical infection.
- C. chronic infection.
- D. macroscopic organism causing the infection.

**SECTION B – SHORT-ANSWER QUESTIONS**

**Instructions for Section B**

Answer **all** questions in the spaces provided. Write using blue or black pen.  
Unless otherwise indicated, the diagrams in this booklet are **not** drawn to scale.

**Question 1** (1 mark)

What is an antigen?

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**Question 2** (1 mark)

Describe the role of the immune system.

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**Question 3** (2 marks)

Organisms may have barriers which prevent pathogens from entering their systems.

List the barriers to infection in humans.

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**Question 4** (2 marks)

Explain the difference between cell-mediated immunity and antibody-mediated immunity.

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**Question 5** (4 marks)

**a.** How are killer T lymphocytes activated? 1 mark

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**b.** What is the stimulus for the activation of these cells? 1 mark

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**c.** How are B lymphocytes activated? 1 mark

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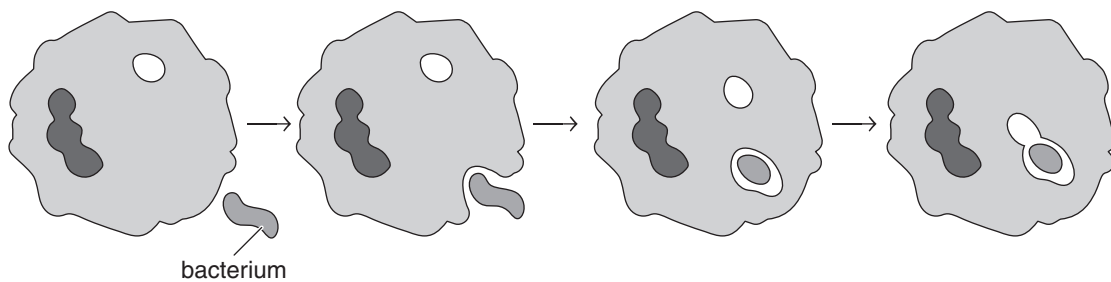
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**d.** How do plasma and memory cells differ? 1 mark

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**Question 6** (3 marks)



**a.** Use one word to describe the process shown in the diagram above. 1 mark

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**b.** Is this response specific or non-specific? Explain your selection. 2 marks

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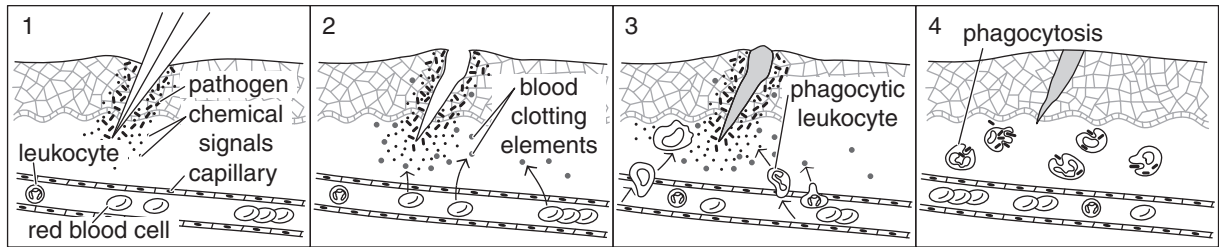
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**Question 7** (3 marks)

Consider the diagram below.



- a. What is the name of the response shown in the diagram? 1 mark

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- b. State **two** changes that are occurring in the blood vessel in the diagram above and explain their role in the immune response. 2 marks

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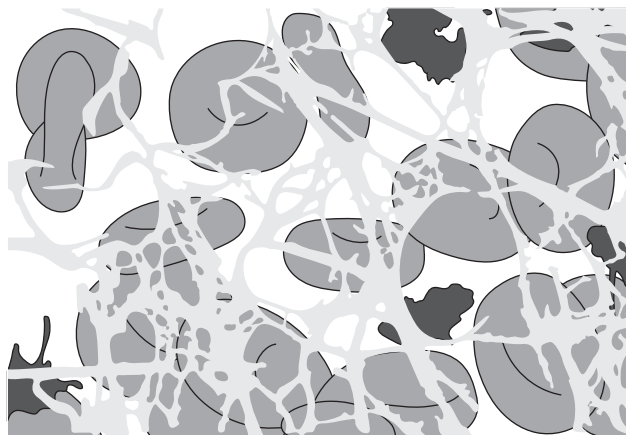
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**Question 8** (2 marks)

With reference to structures visible in the diagram below, describe what immune response it is illustrating and describe the process involved with this immune response.




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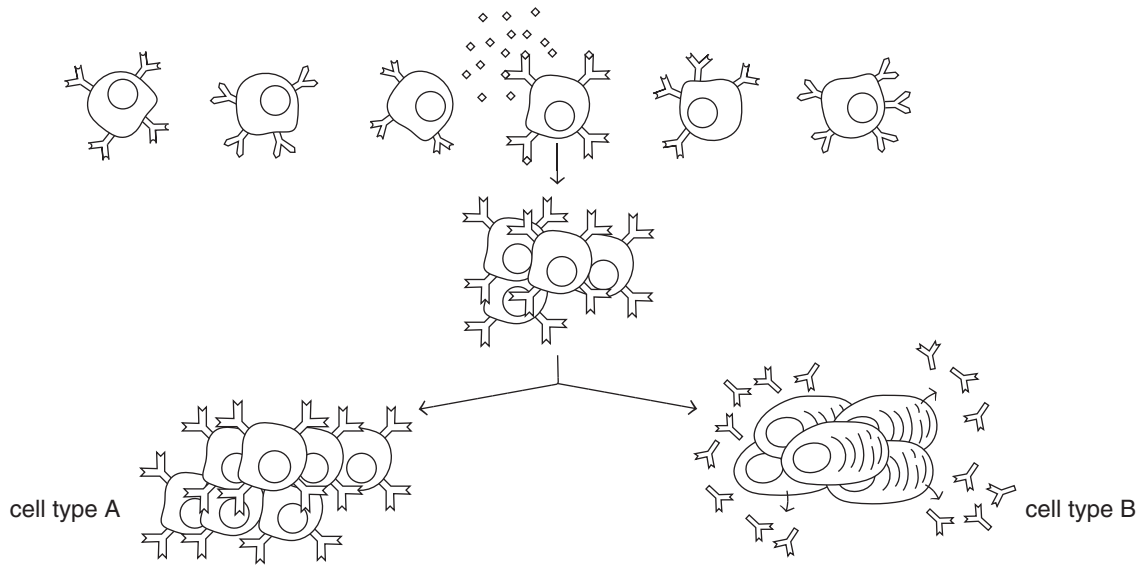
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**Question 9** (5 marks)

Consider the diagram below.



a. What process is illustrated in the diagram above? 1 mark

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b. What is the name given to cell type A? 1 mark

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c. What is the purpose of cell type A? 1 mark

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d. What is the name of cell type B? 1 mark

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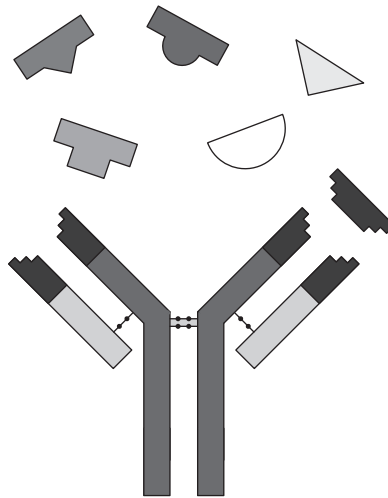
e. What is the purpose of cell type B? 1 mark

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**Question 10** (5 marks)

Consider the structure below.



- a. What is the name given to the structure? 1 mark

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- b. On the above diagram label
- i. the antigen binding site. 1 mark
  - ii. the light chain. 1 mark
  - iii. the heavy chain. 1 mark

- c. The antigen binding site is also known as the 'variable region'.  
What role does this region play in the Clonal Selection Theory? 1 mark

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**Question 11** (2 marks)

State the role of helper T cells in a specific immune response.

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