



BIOLOGY 2017

Unit 3

Key Topic Test 9 – Immunity

Recommended writing time*: 45 minutes

Total number of marks available: 45 marks

SOLUTIONS

SECTION A: Multiple-choice questions (1 mark each)

Question 1

Answer: B

Explanation:

Patient 2 will suffer from measles for a shorter time than Patient 1 because they have a higher level of antibodies circulating in their bloodstream and the response will be more rapid.

Question 2

Answer: C

Explanation:

Vaccination produces long term immunity as it causes activation of B and T cells. All other examples are passive examples of immunity and do not provide long term immunity as memory cells are not produced.

Question 3

Answer: C

Explanation:

Auto-immune diseases are caused when the body fails to distinguish self from non-self.

Question 4

Answer: D

Explanation:

Hypersensitivities such as hayfever are caused by a person reacting to an environmental antigen such as dust and pollen.

Question 5

Answer: B

Explanation:

Histamine causes the symptoms associated with an allergic reaction.

Question 6

Answer: D

Explanation:

Antibodies are specific and only bind one type of antigen. It is thought that Type I diabetes might be activated by insulin producing cells being infected by a pathogen and antibodies being made against those cells.

Question 7

Answer: B

Explanation:

A baby receives antibodies that have been produced by their mother through breastmilk. This is called passive immunity because the antibodies have not been produced by the baby themselves.

Question 8

Answer: D

Explanation:

Active immunity occurs when an individual comes into contact with an antigen and produces antibodies against this antigen. An injection of a toxoid would be recognised as foreign and antibodies made against the antigen.

Question 9

Answer: C

Explanation:

Monoclonal antibodies target cancer cells and as such can be used to treat cancer.

Question 10

Answer: A

Explanation:

An example of naturally acquired passive immunity is immunity conveyed to a fetus by its mother during pregnancy.

SECTION B: Short-answer questions

Question 1

a. Disease which occurs when the body fails to distinguish self from non-self.

1 mark

b.

Type	How acquired?	Short or long term?	Involves immune response?	Involves memory cells?
Natural active	illness/disease	Long	Yes	Yes
Artificial active	vaccination	Long	Yes	Yes
Natural passive	breastfeeding/cross placenta	Short	No	No
Artificial passive	injection of antibodies/antivenom	Short	No	No

1 mark for each correct box

20 marks

Total 21 marks

Question 2

a. Terry’s immune system recognises the pollen proteins as ‘non-self’ antigens which bind to his B plasma cells (1 mark). They produce specific antibodies which bind to his mast cells. Upon another exposure the antigens bind to these antibodies on the mast cells (1 mark) stimulating them to release large amounts of histamine, causing his eyes to water (1 mark)

3 marks

b. If the mice are administered a lower dose of TSLP, then they will be more sensitive to allergens.

1 mark

c. Set up two groups of mice, all in exactly the same environment.(1 mark).

Administer no TSLP to the first group and give the second group TSLP. Expose both groups to the allergen (1 mark)

Monitor and record responses to the allergens over a three week period (1 mark).

3 marks

d. Mice administered that had not been administered TSLP would have a higher number of allergic responses to the allergens.

1 mark

Total 8 marks

Question 3

a. An injection of a killed or weakened organism that produces immunity in the body against that organism.

1 mark

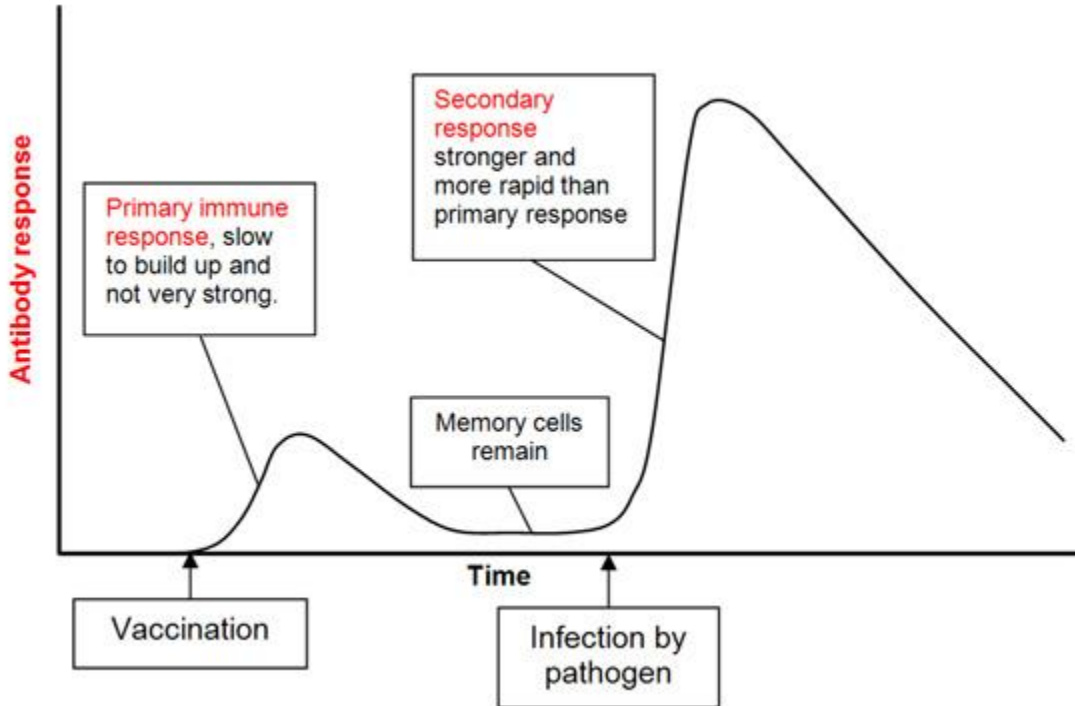
b. So that memory cells have time to form (1 mark) so that if an individual is exposed to the disease overseas an immune response occurs quickly (1 mark).

2 marks

c. Active

1 mark

d.



Line on graph shown is correct.

1 mark

Labels are correct.

1 mark

Total 6 marks