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| --- | --- | --- |
| Test part | Possible mark | Your mark |
| Multiple choice | 12 |  |
| Short answer | 15 |  |
| Extended answer | 7 |  |
| Total | 34 |  |

HUMAN BIOLOGICAL SCIENCE. YEAR 12. 2013.

Immunity and Gene expression Topic Test.

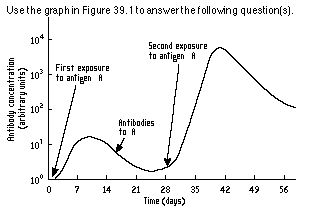
***Multiple choice answer sheet.***

**Use a ball point or ink pen to mark an X** on the letter that represents the best answer from the choice of answers . Marks are not deducted for wrong answers.

|  |  |
| --- | --- |
| Question | Answer |
| 1 | A B C D |
| 2 | A B C D |
| 3 | A B C D |
| 4 | A B C D |
| 5 | A B C D |
| 6 | A B C D |
| 7 | A B C D |
| 8 | A B C D |
| 9 | A B C D |
| 10 | A B C D |
| 11 | A B C D |
| 12 | A B C D |

1. The antibodies that a baby receives from its motherin breast milk are an example of:
2. Natural passive immunity.
3. Artificial passive immunity.
4. Natural active immunity.
5. Artificial active immunity.
6. Vaccination using attenuated antigens is an example of:
7. Natural passive immunity.
8. Artificial passive immunity.
9. Natural active immunity.
10. Artificial active immunity.

Use the diagram below to answer questions 3 and 4.



3. Why does the antibody concentration between 21 and 28 days **not** drop back to zero?

1. Memory T cells carry antibodies able to respond to antigen A.
2. Killer T cells carry antibodies able to respond to antigen A.
3. Memory B cells carry antibodies able to respond to antigen A.
4. Plasma B cells carry antibodies able to respond to antigen A.

4. The response to antigen A at 28 days would result in:

1. A rapid response and little or no symptoms of infection.
2. A reduction in T cells, but an increase in B cells.
3. Similar symptoms as seen in days 0 to 14.
4. A new set of antigens being produced.

5. Genetic drift is:   
  
a. a change in gene frequencies caused by random events.     
b. a change in an allele due to alterations in the DNA molecule.     
c. a change in gene frequencies due to exchange of genes between different populations.     
d. a product of natural selection.

6. The presence of a high tryglicerates among French Canadians in Quebec because of a high incidence in the early population of the provinces is an example of:   
  
a. genetic drift.     
b. gene flow.     
c. natural selection.     
d. the founder effect.

7. Tay-Sachs disease is due to any of several mutant alleles. One possible explanation for its prevalence in Ashkenazi populations is that the alleles provide resistance to:

1. Tuberculosis.
2. Sickle cell anemia.
3. Malaria.
4. Small pox.

8. In 1550 AD 60% of the population of the village of La Pont in France were killed by an outbreak of Plague. This altered the allele frequency of the village. This is an example of:

1. Random genetic drift.
2. Founder effect.
3. Genetic bottleneck.
4. Sociocultural isolation.

9. Agglutination can best be described as:

a. a process where antibodies cause antigens to stick together in clumps.

b. a process where antibodies cause pathogen cell membranes to break.

c. a process where macrophages engulf virus particles.

d. a process where antibodies stop virus particles replicating.

10. A body cell becomes infected by virus particles. The body would respond by:

a. sending antibodies to neutralize the virus.

b. sending Killer T cell white blood cells to attach the infected cell.

c. sending Plasma B cells.

d. sending macrophages to engulf jus the virus particles.

*The next question refers to the graph below of the concentration of antibodies in the blood of two patients over time after exposure to a particular disease.*



11. On the basis of the information provided in this graph,

a. patient 1 was immune to the disease they were exposed to.

b. patient 2 was probably exposed to and recovered from this disease in the past.

c. neither person would have developed memory cells on exposure to this disease.

d. the symptoms of patient 1 would have been far less severe.

12. Bob Caught a bad cold. He stayed home and rested. After a week he fully recovered, without any use of medication. This is an example of:

1. Natural passive immunity.
2. Artificial passive immunity.
3. Natural active immunity.
4. Artificial active immunity.

Short Answer Section

1. Complete this table

|  |  |  |
| --- | --- | --- |
| Type of leucocyte | Where is it produced? | Where does it mature? |
| B cell |  |  |
| T cell |  |  |

1. marks)
2. Write definitions for the words in the table below.

|  |  |
| --- | --- |
| Word | Meaning |
| Antigen |  |
| Antibody |  |

(2 marks)

1. What is opsonisation?

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(3 marks)

1. Sickle cell anaemia (uh-NEE-me-uh) is the most common form of sickle cell disease (SCD). SCD is a serious disorder in which the body makes sickle-shaped red blood cells. “Sickle-shaped” means that the red blood cells are shaped like a crescent.

Normal red blood cells are disc-shaped and look like doughnuts without holes in the centre. They move easily through your blood vessels. Red blood cells contain an iron-rich protein called haemoglobin (HEE-muh-glow-bin). This protein carries oxygen from the lungs to the rest of the body.

Sickle cells contain abnormal haemoglobin called sickle haemoglobin or haemoglobin S. Sickle haemoglobin causes the cells to develop a sickle, or crescent, shape.

Sickle cells are stiff and sticky. They tend to block blood flow in the blood vessels of the limbs and organs. Blocked blood flow can cause pain and organ damage. It can also raise the risk for infection. It also reduces the amount of oxygen being carried in the body

1. Sickle cell anaemia is caused by a recessive allele. Why would this allele normally be removed from the gene pool?

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(2 marks)

1. Why has Sickle cell anaemia not been removed from the gene pool?

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(4 marks)

EXTENDED ANSWER QUESTION

1. Describe how the antibody mediated response to antigens occurs. Use diagrams where appropriate.

(7 marks)

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