

**Name of the Student:** \_\_\_\_\_

**Max. Marks : 18 Marks**

**Time : 18 Minutes**

**Q1.**

The MMR vaccine is used to protect children against measles, mumps and rubella.

- (a) Explain, as fully as you can, how the MMR vaccine protects children from these diseases.

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**(3)**

- (b) Read the passage.

Autism is a brain disorder that can result in behavioural problems. In 1998, Dr Andrew Wakefield published a report in a medical journal. Dr Wakefield and his colleagues had carried out tests on 12 autistic children.

Dr Wakefield and his colleagues claimed to have found a possible link between the MMR vaccine and autism.

Dr Wakefield wrote that the parents of eight of the twelve children blamed the MMR vaccine for autism. He said that symptoms of autism had started within days of vaccination.

Some newspapers used parts of the report in scare stories about the MMR vaccine. As a result, many parents refused to have their children vaccinated.

Dr Wakefield's research was being funded through solicitors for the twelve children. The lawyers wanted evidence to use against vaccine manufacturers.

Use information from the passage above to answer these questions.

- (i) Was Dr Wakefield's report based on reliable scientific evidence?

Explain the reasons for your answer.

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(2)

- (ii) Might Dr Wakefield's report have been biased?

Give the reason for your answer.

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(1)

(Total 6 marks)

Q2.

Penicillin is an antibiotic which stops bacteria from reproducing. It was used a lot in the past to treat bacterial infections in humans and other animals. In many hospitals there are now strains of penicillin resistant bacteria.

Explain how natural selection could have produced these strains of penicillin resistant bacteria.

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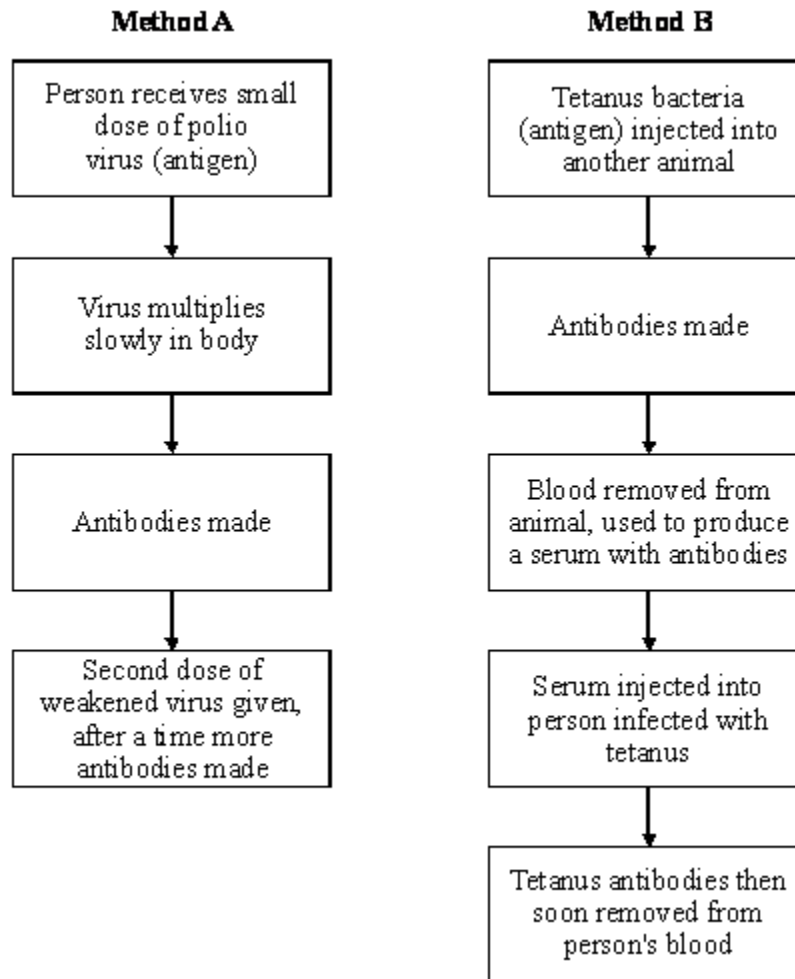
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**(Total 5 marks)**

Q3.

The diagram shows two methods which are used to give humans protection against disease.

**Method A** shows active immunity and **Method B** shows passive immunity. **Method A** can be used against polio. **Method B** is often used against tetanus.



- (a) What is the name of the substances produced by the body which destroy harmful viruses and bacteria?

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(1)

- (b) Why does **Method A** give long lasting protection against polio?

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(1)

- (c) Why does **Method B** not give long lasting protection against tetanus?

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(1)

- (d) In immunisation against polio a second dose of the weakened virus is given (this is known as a booster). Suggest why this booster is necessary.

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(1)

- (e) **Method A** would **not** be helpful for a person who had just been infected with tetanus bacteria.

Explain the reason for this.

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(2)

- (f) Why is **Method B** very good for dealing quickly with an infection of tetanus?

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(1)

(Total 7 marks)