

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

Read the following passage.

One of the deadliest diseases in history to be making a comeback in Britain. Doctors are alarmed at the rising number of cases of tuberculosis (TB) over the past three years, after decades in which it had declined.

In the middle of the last century TB accounted for 16% of all deaths in Britain. The turning point in the fight against TB came in 1882 when Robert Koch identified the bacterium that causes the disease. In 1906 two French scientists began developing the vaccine to provide immunity against TB. The vaccine, BCG, (so-called from the initials of the two scientists) has routinely been injected into children aged 12 or 13 who are not already infected with the TB bacterium. BCG does not protect people who are already infected with TB. Recently, however, some Health Authorities have dropped their school vaccination programme.

- (a) People infected with a small number of TB bacteria often do **not** develop the disease.

Explain, as fully as you can, how the body defends itself against the TB bacteria.

(3)

- (b) The BCG vaccine contains a mild form of the TB bacterium. A person injected with it does **not** develop the disease.

Explain, as fully as you can, how the vaccine makes the person immune to tuberculosis.

(3)

- (c) Explain why the BCG vaccine is **not** effective as a cure for people who already have tuberculosis.

(2)

(Total 8 marks)

Q2.

Read the following passage.

'The immune system is the body's defence force. It protects against infections which might enter the body. The potential invaders include bacteria and viruses. The two basic defences are cells and chemicals. The best known action of defence cells is the ingesting and killing of microbes. The best known chemical defence is the antibody - a protein specially made to match with the surface of an invading microbe. Once covered with antibody, the microbe becomes easier to destroy.

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So how do the invaders ever win? Part of the answer is that the chemical defenders take some time to become effective. When the body is infected for the first time by a particular microbe, there is a race between the multiplying microbes and the multiplying cells producing the antibody. Given time, the body usually wins; eventually enough antibodies are formed to overcome the invaders. But if the initial invasion force is large, or the immune system is weak, the battle may be lost.'

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(a) (i) Which type of cells ingest and kill invading microbes? (lines 3 - 4)

(1)

(ii) Give **two** circumstances in which the initial invasion force might be very large (lines 11 - 12).

1. _____

2. _____

(2)

(iii) After being ingested, the microbes are digested in the cells. Briefly explain what happens to the proteins that the microbes contain.

(2)

(b) Explain how bacteria cause disease once they get into the body.

(2)

(c) Name a type of medicine that kills bacteria inside the body.

- (d) People often risk first-time infection by a particular microbe while visiting other countries. People can be immunised against the disease that the microbe causes.

Explain, as fully as you can, how immunisation works.
