

The immune system

Question Paper 2

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Immunity
Sub Topic	The immune system
Booklet	Theory
Paper Type	Question Paper 2

Time Allowed : 47 minutes

Score : / 39

Percentage : /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	77.5%	70%	62.5%	57.5%	45%	<45%

- 1 Pathogens enter the body in a variety of ways, including through the gas exchange system. The body has several defence mechanisms against the entry of pathogens and their spread throughout the body.

Fig. 2.1 is an electron micrograph of a cross section of the lining of a bronchiole.

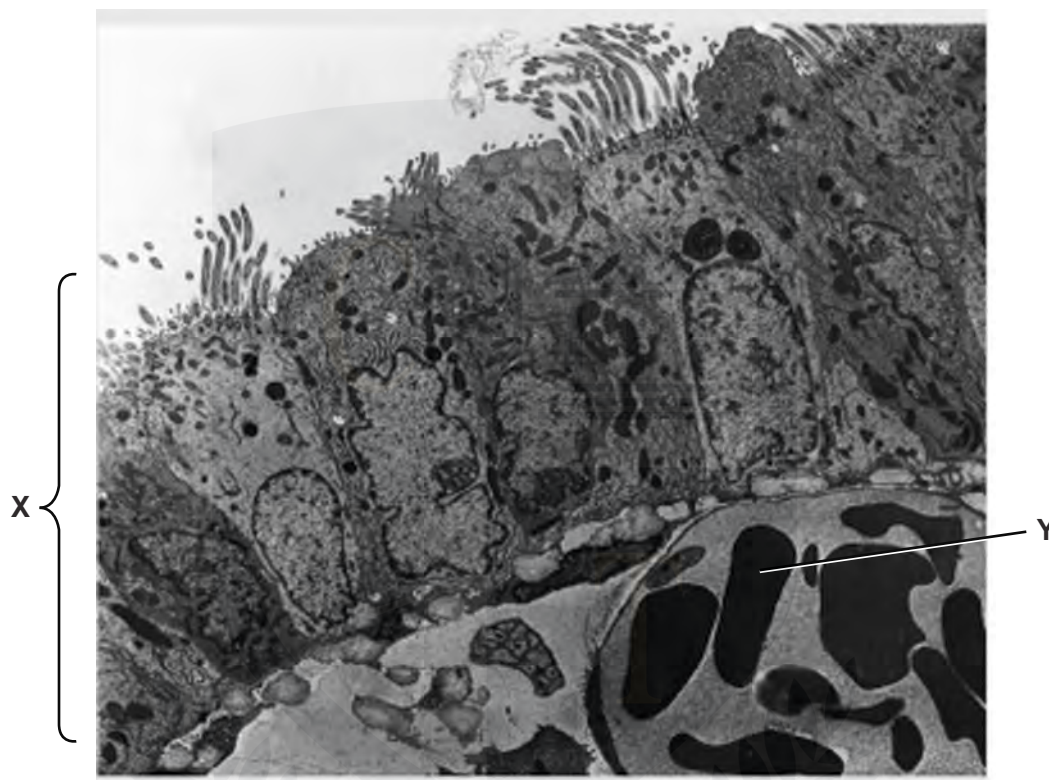


Fig. 2.1

- (a) (i) Name tissue X and cell Y.

X

Y[2]

- (ii) With reference to the structures visible in Fig. 2.1, state three ways in which the lining of the trachea, bronchus and bronchioles provides protection against the entry of bacterial pathogens.

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2

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3

.....[3]

Fig. 2.2 shows part of the immune response to the first infection by a bacterial pathogen that has entered the body through the lining of a bronchiole. **J** and **K** are stages in the immune response.

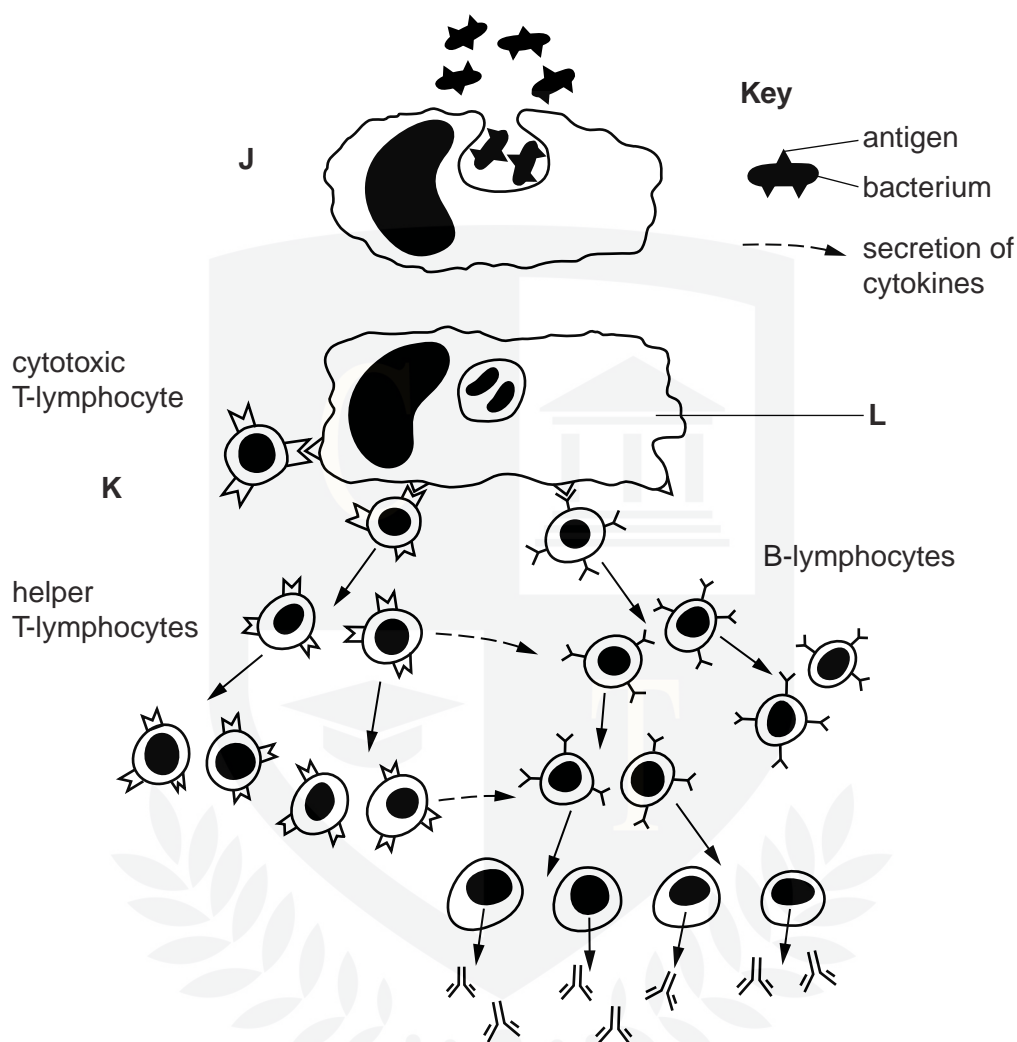


Fig. 2.2

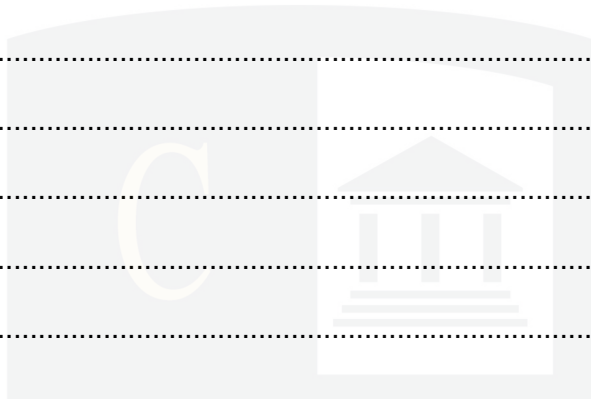
(b) (i) State what is happening at stage **J**.

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[1]

(ii) Explain the role of cell **L** at stage **K** in the immune response.

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[2]

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- [3]

(i) The number of T-lymphocytes is reduced in a person with HIV/AIDS.

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..... [1]

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- [1]

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2 Table 4.1 shows some information about five infectious diseases.

Table 4.1

infectious disease	name of causative organism(s)	type of causative organism	main mode of transmission
HIV/AIDS	human immunodeficiency virus (HIV)	virus	sexual contact
cholera	<i>Vibrio cholerae</i>		ingestion of contaminated water and food
tuberculosis	<i>Mycobacterium tuberculosis</i>	bacterium	
measles		virus	aerosol / droplet infection
	<i>Plasmodium vivax</i> or <i>P. malariae</i> or <i>P. falciparum</i> or <i>P. ovale</i>		

(a) Complete Table 4.1. [3]

(b) In 2011, the World Health Organization (WHO) published recommendations to help countries develop plans to prevent the spread of HIV.

Discuss the factors that should be considered when making recommendations concerning the prevention of sexual transmission of HIV.

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- The onset of disease, which can occur many years later, coincides with a severely lowered primary and secondary immune response, owing to greatly reduced numbers of T_h cells in the body.

- The following processes occur during one cell cycle:

List the processes in a correct sequence.

- (ii) Suggest **and** explain how the destruction of **memory** T_h cells will contribute to a lowered **secondary** immune response.


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[3]

Dr. Asher Rana

3 Diseases are either infectious or non-infectious.

(a) Complete Table 4.1 to produce a summary of four important infectious diseases.

Table 4.1

name of disease	type of causative organism	name of causative organism
cholera	bacterium	<i>Vibrio cholerae</i>
HIV/AIDS	virus	
malaria		
tuberculosis (TB)		<i>Mycobacterium tuberculosis</i>

[4]

(b) Typhoid is an example of an infectious disease.

Some features of typhoid include:

- caused by a bacterium that can only infect humans
- caused by the ingestion of contaminated food and water
- can be treated with drugs
- can be prevented by a vaccine.

(i) State which of the diseases named in Table 4.1 is transmitted in the same way as typhoid.

..... [1]

(ii) State which type of drug can be used in the treatment of typhoid. Give a reason for your answer.

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..... [1]

- (iii) Child vaccination programmes against typhoid in some countries have had considerable success. The numbers contracting the disease have decreased, not only in the vaccinated children, but also in other age groups that were not part of the programme.

Suggest explanations for this observation.

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..... [2]

- (c) After infection, the ingested typhoid bacteria are engulfed by phagocytes.

- (i) Explain why the phagocytes act only against the bacteria and not against human cells.

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- (ii) Unlike other bacteria, the typhoid bacteria are able to survive and multiply within the phagocytes.

Suggest an explanation for this observation.

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- (iii) Explain why people with HIV/AIDS are more susceptible to infections, such as typhoid.

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