QUESTIONSHEET 1

Immunity can be defined as the ability to resist infection.

(a) A person can acquire immunity actively or passively. Complete the table to show some of the features of passive and active immunity. Place a tick in the box if the feature applies and a cross if it does not apply.

	The person produces an immune response	The person produces memory cells	The immunity can be acquired naturally and artificially
Passive immunity			
Active immunity			

[2]

(b) Some vaccinations contain attenuated microorganisms, others contain killed microorganisms. It is now thought preferable to develop vaccines containing attenuated microorganisms wherever possible.

(i) What is an attenuated microorganism?

.....

.....

..... [2]

(ii) Suggest why vaccines containing attenuated microorganisms might be preferred to those containing killed microorganisms.

.....

.....

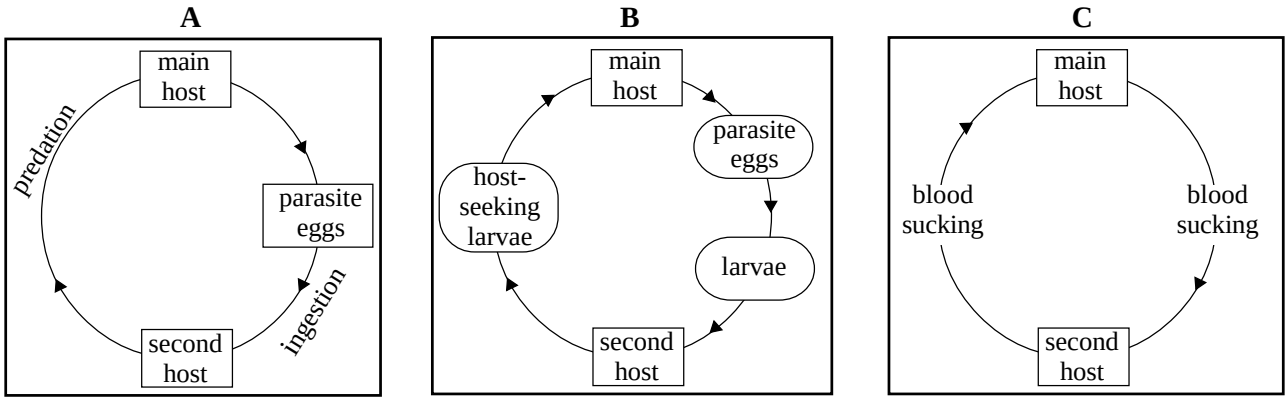
..... [2]

TOTAL / 6

QUESTIONSHEET 2

Parasites are organisms which live in or on another organism and feed from this organism. Two diseases caused by parasites are malaria and schistosomiasis.

(a) The diagrams show three different patterns of life cycles of parasites.



Which life cycle most closely resembles that of :

(i) the malarial parasite?

..... [1]

(ii) the parasite causing schistosomiasis?

..... [1]

(b) How does the malarial parasite avoid producing an immune response once inside the human body?

.....

.....

..... [3]

(c) The adult parasite causing schistosomiasis spends most of its time inside the human gut. Suggest one advantage and one disadvantage in living in this part of the human body.

Advantage .....

.....

Disadvantage .....

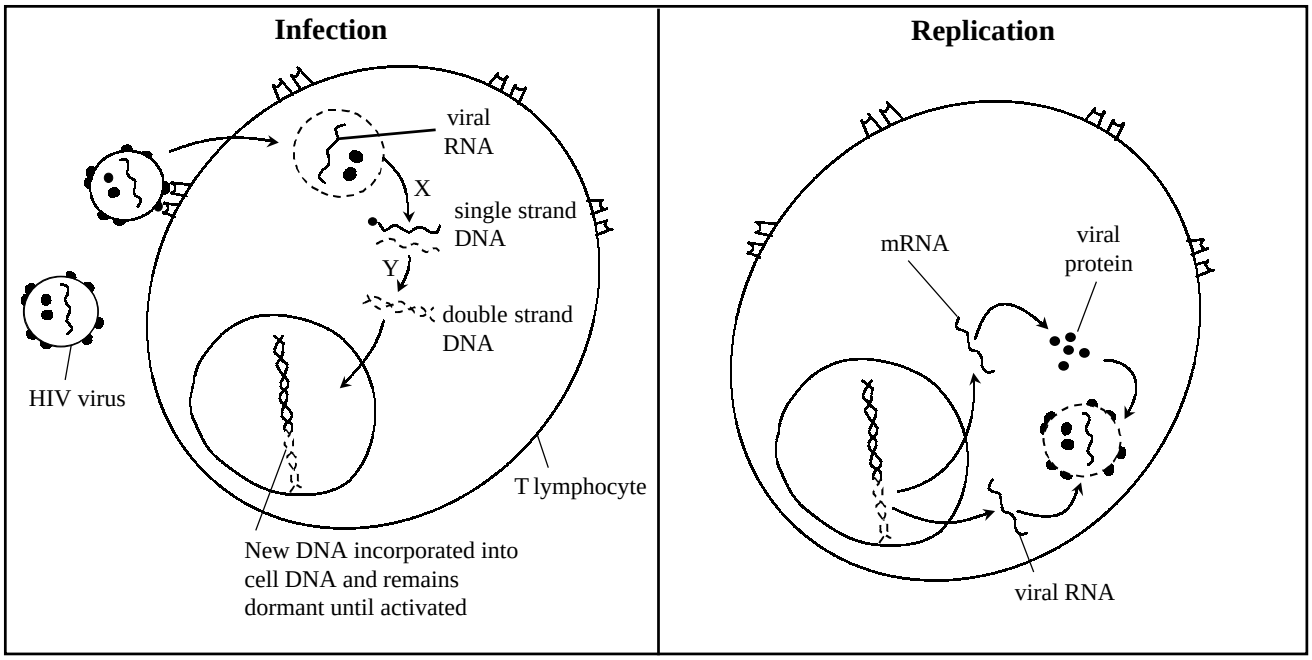
..... [2]

TOTAL / 7

QUESTIONSHEET 3

Infection with the human immuno-deficiency virus (HIV) can cause AIDS. The virus infects some types of T lymphocytes and replicates within them. Eventually, infection with HIV can lead to AIDS, in which the person may develop tumours and a number of infectious diseases.

(a) The mechanism of infection and replication is shown in the diagram.



(i) Suggest how the virus "recognises" the T lymphocytes.

.....

.....

..... [2]

(ii) What type of viral enzyme controls the processes labelled X and Y? Give evidence from the diagram to support your answer.

X: .....

..... [2]

Y: .....

..... [2]

(iii) Use the diagram and your own biological knowledge to describe how new HIV particles are made.

.....

.....

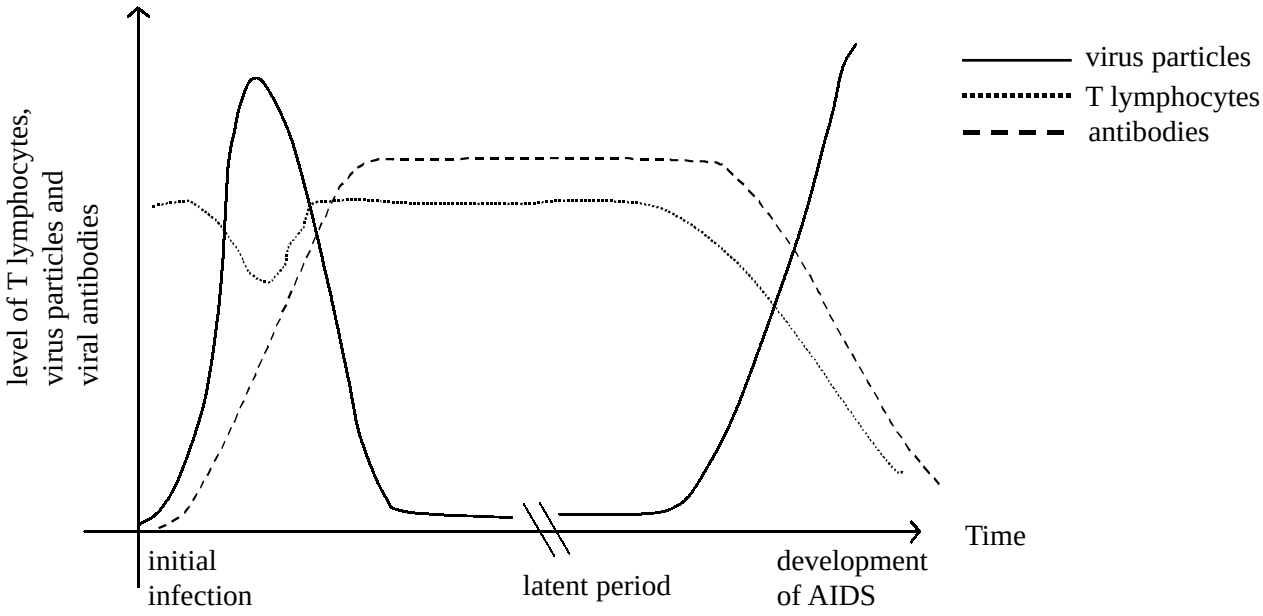
.....

.....

..... [4]

(*Continued...*)

(b) The graph shows the changes in the levels of HIV particles, HIV antibodies and T lymphocytes in the blood during the different stages of HIV infection.



(i) What is an antibody?

.....

.....

..... [2]

(ii) The presence of HIV antibodies in the blood is used to diagnose infection with the virus. An infected person is described as HIV positive. Suggest a basis for the test.

.....

..... [2]

(iii) With reference to the graph above suggest why, in the final stage of HIV infection, a person may develop tumours and a range of diseases.

.....

.....

.....

.....

..... [3]

TOTAL / 17

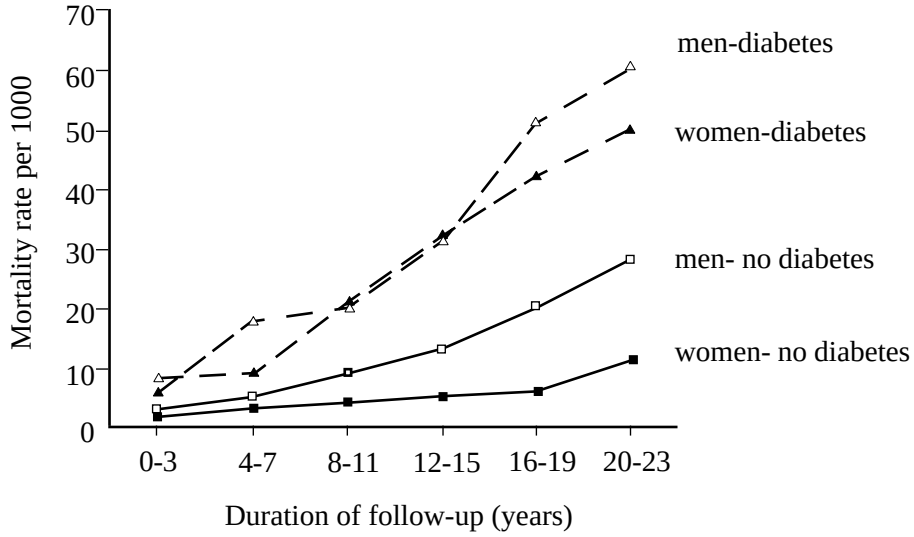
Do not write in margin

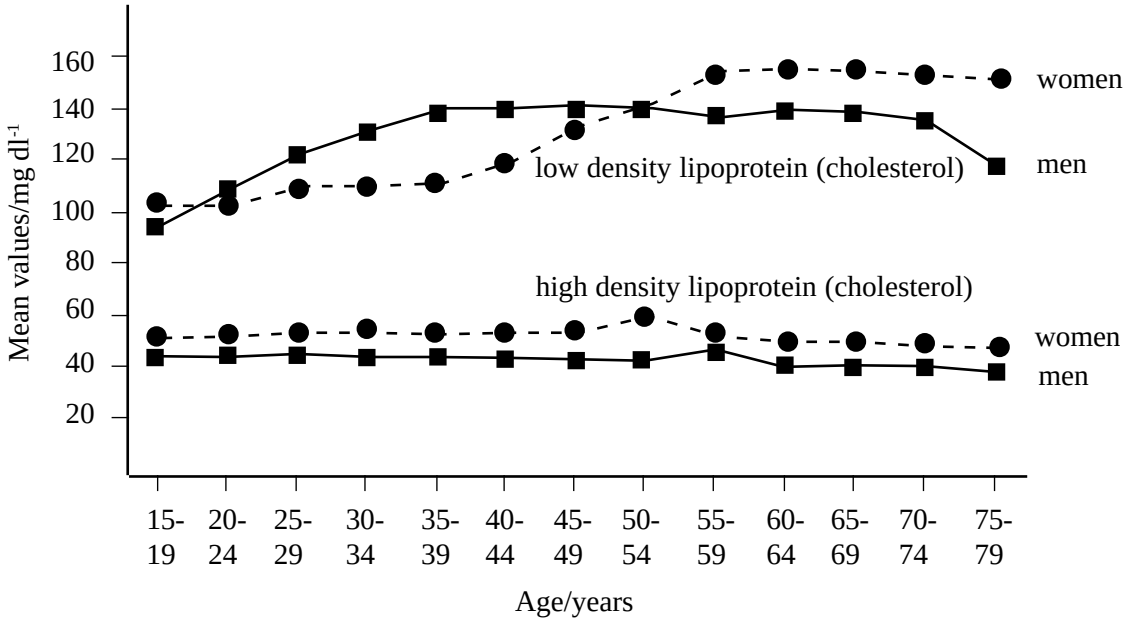
(a) Define the term coronary heart disease.

.....

..... [2]

The graph 1 below shows the results of an investigation into the relationship between mortality from coronary heart disease (CHD) and the incidence of diabetes. Graph 2 shows age trends in cholesterol levels in men and women.





(b) (i) Describe the relationship between CHD and diabetes.

.....

.....

..... [2]

(*Continued...*)

Do not write in margin

(ii) Explain how high density lipoproteins (HDLs) are thought to reduce the risk of developing CHD.

.....

.....

..... [2]

(c) Suggest an explanation for the difference in CHD mortality between men and women who do not suffer from diabetes.

.....

.....

..... [2]

(d) State two other risk factors for CHD.

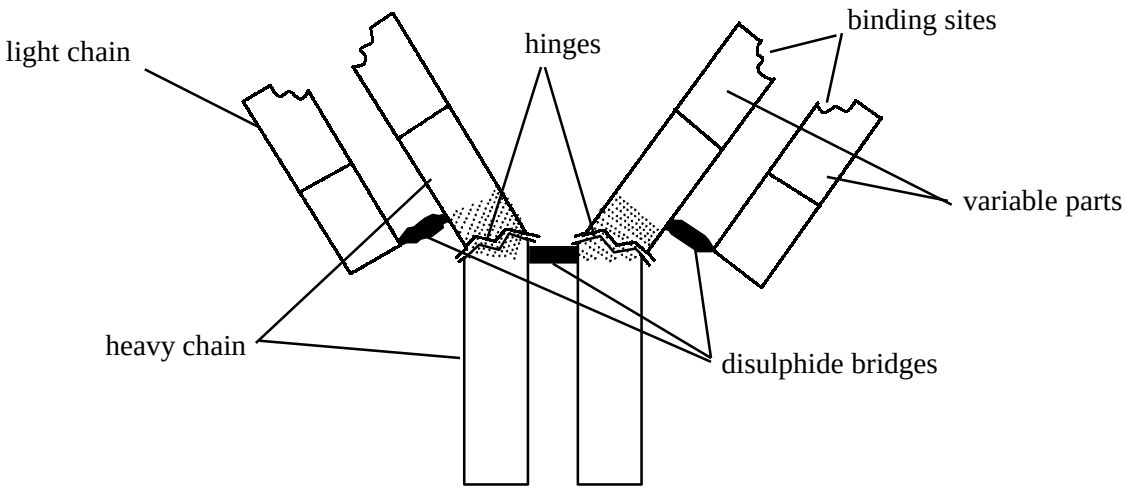
1. .....

2. ..... [2]

TOTAL / 10

QUESTIONSHEET 5

The diagram below shows the general structure of an antibody molecule.



(a) (i) Name the cells which release antibodies during the immune response.

..... [1]

(ii) Describe how an antibody, such as the one shown above, works.

.....

.....

.....

.....

..... [4]

(iii) State the roles of the helper T-cells in the immune response.

.....

.....

..... [3]

(b) Explain the roles of memory cells in immunity.

.....

.....

.....

..... [3]

TOTAL / 11

Do not write in margin

QUESTIONSHEET 6

Suggest reasons for the following:

(a) (i) the recommendation from the Health Service Directorate to doctors, suggesting that they do not prescribe antibiotics to patients suffering from viral infections.

.....

.....

.....

..... [3]

(ii) it is important for patients who are taking antibiotics to finish taking the course of tablets and to keep to the prescribed time limits.

.....

.....

.....

..... [3]

(iii) antibiotics are sometimes given in solution form by intravenous injection rather than than in tablet form, by mouth.

.....

.....

..... [2]

(b) An ideal antibiotic should meet certain requirements. Suggest three such requirements.

1. .....

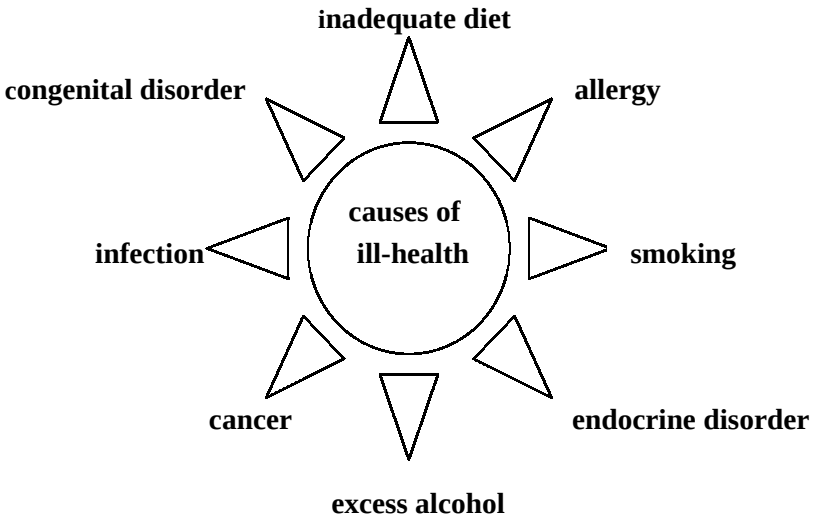
2. .....

3. ..... [3]

TOTAL / 11

QUESTIONSHEET 7

The diagram below represents some possible causes of ill-health in humans.



(a) Name four different groups of infective organism and in each case name a disease caused by the type of organism named.

1. .....

2. .....

3. .....

4. ..... [4]

(b) Name a congenital chromosomal abnormality and state its genetic cause or defect.

.....

..... [2]

(c) Name an endocrine disorder and give a brief description of it.

.....

.....

..... [4]

(d) What are kwashiorkor and marasmus?

.....

..... [2]

(*Continued...*)

(e) Name two different types of agent that may induce the development of cancer.

1. .....

2. ..... [2]

(f) For each of the following, give three possible effects of long-term overuse:

(i) cigarette smoking.

1. .....

2. .....

3. ..... [3]

(ii) alcohol.

1. .....

2. .....

3. ..... [3]

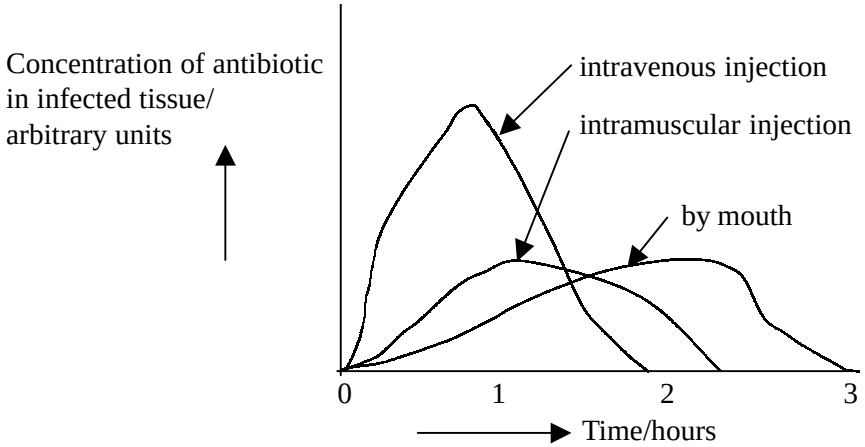
(g) Name two common allergic conditions.

1. ..... 2. ..... [2]

TOTAL / 22

QUESTIONSHEET 8

The graph below shows the time taken for an antibiotic to reach certain concentrations in infected tissues after administration by different routes.



(a) (i) Distinguish between the terms 'antibiotic' and 'antibody'.

.....

.....

.....

..... [4]

(ii) Suggest reasons for the different concentrations in infected tissue achieved by the different methods of administration.

.....

.....

.....

.....

.....

..... [6]

(iii) Distinguish between 'broad spectrum' and 'narrow spectrum' antibiotics.

.....

.....

..... [3]

(b) Antibodies may sometimes be injected into people. Explain why this is so.

.....

.....

..... [3]

TOTAL / 16

Do not write in margin

QUESTIONSHEET 9

Suggest explanations for the following facts;

(a) HIV viruses contain the enzyme ‘reverse transcriptase’.

.....

.....

.....

..... [3]

(b) The female Anopheles mosquito can transmit the malarial parasite (Plasmodium) from human to human but does not act as a vector for the HIV virus.

.....

.....

.....

..... [3]

(c) Cat HIV viruses which cause the development of HIV in cats will not infect humans.

.....

.....

..... [2]

(d) HIV positive individuals are more prone to infection by organisms causing diseases such as tuberculosis, pneumonia and thrush.

.....

.....

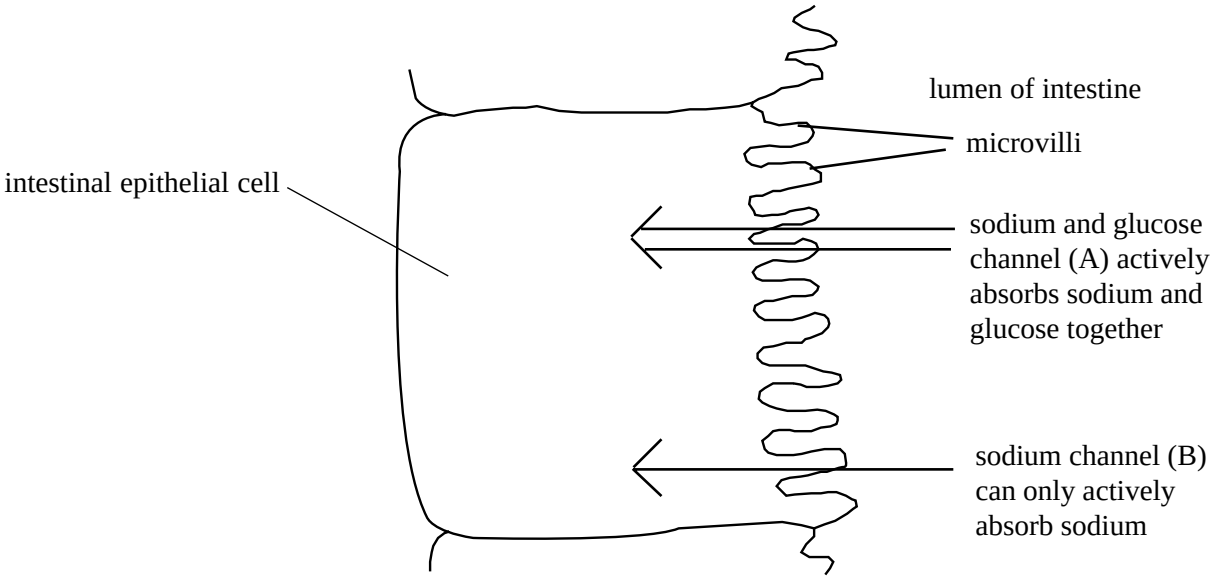
.....

..... [3]

TOTAL / 11

QUESTIONSHEET 10

Bacterial toxins released into the gut in the cases of food poisoning may cause diarrhoea by impairing the absorption of electrolytes from the gut into the blood. The diagram below shows the two ways in which intestinal villi cells can absorb sodium ions from the gut lumen.



(a) How would blocking of the sodium channel B lead to diarrhoea?

.....

.....

[2]

(b) In oral rehydration therapy the patient is given a solution of glucose and salts that is isotonic to the blood. How would this treatment benefit the patient?

.....

.....

[2]

(c) Would the oral rehydration therapy be made more effective if more glucose was added to the fluid? Explain your answer.

.....

[2]

(d) Would a mixture of starch and salts be more effective as an oral rehydration therapy? Explain your answer.

.....

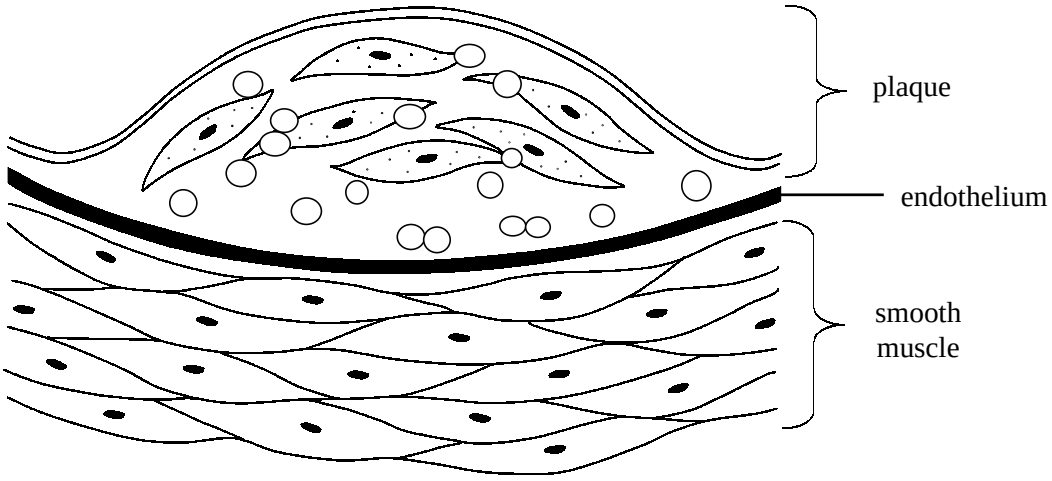
.....

[2]

TOTAL / 8

QUESTIONSHEET 11

The diagram shows an atheromatous plaque in a coronary artery.



(a) Explain how an atheromatous plague may increase the risk of a sudden heart attack (myocardial infarction).

.....

.....

.....

.....

[3]

(b) State four risk factors which may predispose individuals to this condition.

1 .....

2 .....

3 .....

4 .....

[4]

Patients who are suffering from a mismatch in myocardial oxygen demand and supply may be treated with nitrates. Nitrates relax smooth muscle in systemic and coronary arteries, and in veins.

(c) Explain how nitrates help to reduce the chance of a patient suffering a myocardial infarction.

.....

.....

.....

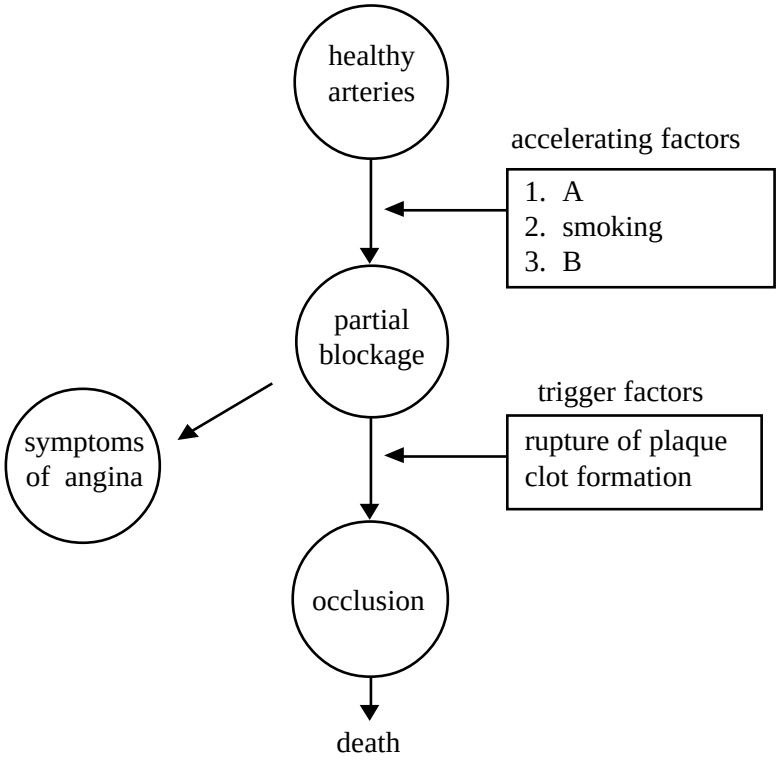
.....

[3]

TOTAL / 10

QUESTIONSHEET 12

The diagram shows a sequence of events which ends in a blockage in the coronary arteries.



(a) Suggest the identity of accelerating factors A and B.

A: ..... [1]

B: ..... [1]

(b) Explain why smoking may be considered an accelerating factor.

.....

.....

.....

.....

.....

.....

..... [5]

(c) (i) What are the symptoms of angina?

..... [1]

(ii) What causes the symptoms?

.....

..... [2]

TOTAL / 10 _____