

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Q1.

Pathogens are microorganisms that cause diseases.

Gonorrhoea, malaria and measles are three diseases in humans.

(a) Draw **one** line from each disease to the pathogen that causes the disease.

Disease	Pathogen
Gonorrhoea	Bacterium
Malaria	Fungus
Measles	Protist
	Virus

(3)

(b) Malaria is transmitted by mosquitos.

Male mosquitos can be sterilised so they are infertile.

The spread of malaria is reduced by releasing sterile mosquitos into the environment.

Explain how releasing sterile mosquitos reduces the spread of malaria.

(2)

Pathogens also cause diseases in plants.

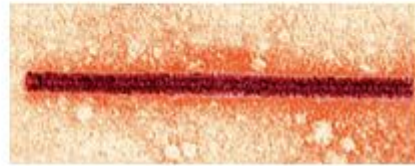
The figure below shows a rose black spot fungal spore and a tobacco mosaic virus.

Rose black spot fungal spore



16 μm

Tobacco mosaic virus



$2.5 \times 10^{-7} \text{ m}$

- (c) Name the piece of equipment used to view the virus.

(1)

- (d) How many times longer is the fungal spore than the virus?

Use the figure above.

Number of times longer = _____

(3)

- (e) Explain why plants infected with tobacco mosaic virus grow slowly.

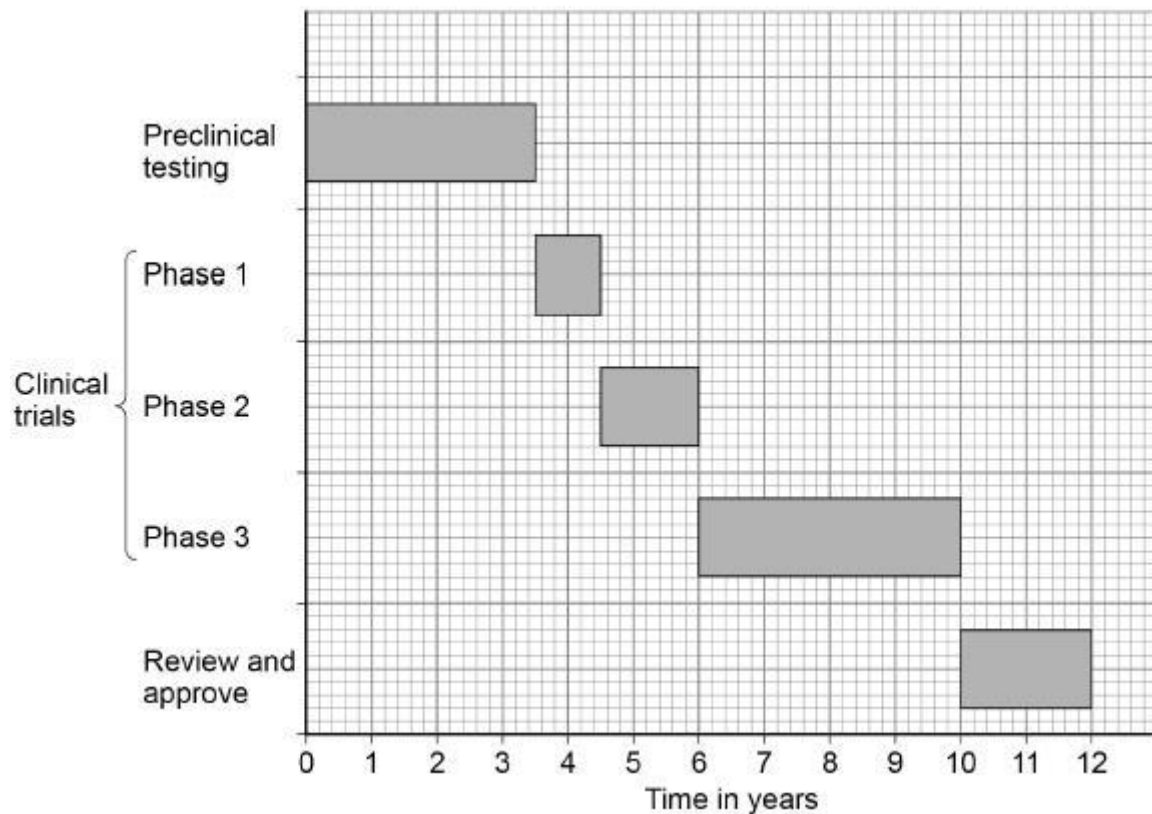
(3)

(Total 12 marks)

Q2.

New drugs are tested and trialled before they can be licensed to treat patients.

The graph below shows how much time the different stages of testing took for one new drug.



- (a) How much more time did the clinical trials take compared with the preclinical testing?

Tick (✓) **one** box.

3 years

☐

3.5 years

☐

5 years

☐

6.5 years

☐

(1)

During Phase 1 clinical trials low doses of the drug are tested on healthy volunteers.

- (b) Suggest **one** reason why **low doses** of the drug are used in Phase 1 clinical trials.

(1)

- (c) Suggest **two** reasons why **healthy** volunteers are used in Phase 1 clinical trials.

1. _____

2. _____

(2)

- (d) The results of clinical trials can only be published after peer review by other scientists.

Suggest **one** reason why the results must be reviewed by other scientists.

(1)

- (e) A drug is only licensed for the medical conditions it was tested to treat in the clinical trials.

Drug regulations:

- control what drugs a doctor can prescribe
- ensure doctors can prescribe a drug with confidence
- protect patients.

AMD is an eye condition that can result in very poor vision.

Doctors treat approximately 40 000 new cases of AMD each year.

Two drugs licensed to treat AMD in the UK are drug **A** and drug **B**.

In many other countries drug **C** is used to treat AMD. Drug **C** is only licensed in the UK to treat cancer.

The cost per injection for each drug is:

- drug **A** £561
- drug **B** £800
- drug **C** £28

The number of injections required to treat AMD is the same for each drug.

In 2018 the High Court in the UK gave permission for drug **C** to be used to treat AMD.

Evaluate the decision to allow the use of drug **C** to treat AMD in the UK.

(6)
(Total 11 marks)