

Infection and response practice questions

19 questions • 58 marks • mark scheme at the back

For AQA GCSE Combined Science: Trilogy 8464. **Higher tier** is only on the Higher paper.

Name

Total / 58

1 Which of these lists contains only types of pathogen? [1 mark]

- A. ☐ Viruses, bacteria, protists and fungi
- B. ☐ Viruses, bacteria, enzymes and fungi
- C. ☐ Bacteria, protists, antibodies and fungi
- D. ☐ Viruses, protists, antitoxins and bacteria

2 Describe three ways in which pathogens can be spread. [3 marks]

3 State two symptoms of measles and describe how the measles virus is spread. [3 marks]

4 HIV can lead to AIDS. (a) Describe how HIV is spread. (2) (b) Explain how HIV infection can lead to AIDS. (2) [4 marks]

5 Tomato plants infected with tobacco mosaic virus (TMV) have leaves with a mosaic pattern and the plants grow slowly. Explain why the plants grow slowly. **[2 marks]**

6 *Salmonella* food poisoning is caused by bacteria. (a) Describe how people become infected with *Salmonella*. (1) (b) State two symptoms. (2) **[3 marks]**

7 Gonorrhoea is a sexually transmitted disease. (a) Describe two symptoms of gonorrhoea. (2) (b) Give one way the spread of gonorrhoea can be controlled. (1) **[3 marks]**

8 Rose black spot is a fungal disease. (a) Describe the symptoms of rose black spot. (1) (b) Describe two ways of treating rose black spot. (2) **[3 marks]**

9 Malaria is caused by a protist. (a) Explain how malaria is spread from one person to another. (2) (b) Describe two ways the spread of malaria can be controlled. (2) **[4 marks]**

10 Which of these is one of the body's non-specific defences against pathogens? **[1 mark]**

- A. ☐ Antibody production
- B. ☐ Antitoxin production
- C. ☐ Acid in the stomach
- D. ☐ Vaccination

11 Describe how the skin, the nose, the trachea and bronchi and the stomach each help to defend the body against pathogens. **[4 marks]**

12 Describe three ways in which white blood cells help to defend the body against pathogens. **[3 marks]**

13 Explain how vaccination prevents a person from becoming ill with a disease. **[4 marks]**

14 A town has 15 000 people. 12 600 people have been vaccinated against measles. **[2 marks]**
Calculate the percentage of the population that is vaccinated.

Answer =

15 Explain how vaccinating a large proportion of a population can protect people who have not been vaccinated. **[2 marks]**

16 A patient has influenza, which is caused by a virus. The doctor decides not to prescribe an antibiotic. Explain why. **[3 marks]**

17 Name the plant or microorganism that each of these drugs originates from. (a) digitalis (1) (b) aspirin (1) (c) penicillin (1) **[3 marks]**

18 A new drug has been developed. Describe how preclinical testing and clinical trials are used to test the drug. **[4 marks]**

19 Describe the process of discovery and development of a new medicine. Include preclinical testing, clinical trials and what happens to the results.

[6 marks]

[illegible]

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

A A (1)

2. [3]

- by direct contact (1) allow example, e.g. sexual contact / exchange of body fluids
- by water (1)
- by air (1) allow droplets from coughs and sneezes

3. [3]

- fever (1)
- red skin rash (1)
- inhalation of droplets from sneezes and coughs (1) allow breathing in droplets

4. [4]

- sexual contact (1)
- exchange of body fluids / blood (1) allow sharing needles by drug users
- HIV attacks the body's immune cells (1) allow white blood cells
- (late stage infection / AIDS) immune system so badly damaged that it cannot deal with other infections or cancers (1)
- do not accept 'HIV is cured / killed by antiretroviral drugs'

5. [2]

- leaves discoloured / mosaic pattern so less photosynthesis (1)
- less glucose / food made for growth (1)
- ignore 'less chlorophyll' unless linked to photosynthesis

6. [3]

- (a) bacteria ingested in food / food prepared in unhygienic conditions (1)
- (b) fever (1)
- (b) abdominal cramps (1)
- (b) vomiting (1)
- (b) diarrhoea (1)
- Max 3 (max 2 for (b))

7. [3]

- thick yellow or green discharge (from vagina or penis) (1)
- pain on urinating (1)
- treatment with antibiotics / using a barrier method of contraception, e.g. condom (1)

8. [3]

- purple or black spots on leaves (1) allow leaves turn yellow and drop early
- using fungicides (1)
- removing and destroying affected leaves (1)

9. [4]

- mosquito is the vector / carries the pathogen (1)
- mosquito picks up the protist from an infected person and passes it on when it bites another person (1)
- preventing the mosquitos from breeding (1)
- using mosquito nets to avoid being bitten (1)

10. [1]

C C (1) (stomach acid kills pathogens; A and B are white blood cell responses to a particular pathogen or toxin; D is a medical intervention, not a natural body defence)

11. [4]

- skin acts as a barrier (to pathogens) (1) allow secretes substances that kill pathogens
- nose: hairs / mucus trap pathogens (1)
- trachea and bronchi: mucus traps pathogens (and cilia move it away) (1)
- stomach: (hydrochloric) acid kills pathogens (1)

12. [3]

- phagocytosis / engulf and digest pathogens (1)
- antibody production (1) allow antibodies destroy / target specific pathogens
- antitoxin production (1) allow antitoxins neutralise toxins
- do not accept 'kill pathogens' without a method

13. [4]

- vaccine contains dead / inactive form of the pathogen (1)
- stimulates white blood cells to produce antibodies (1)
- if same pathogen re-enters the body, white blood cells respond quickly (1)
- produce the correct antibodies (1) so infection prevented / pathogen destroyed
- do not accept 'vaccine contains antibodies' or 'live pathogen'

14. [2]

- $12\,600 \div 15\,000 \times 100$ (1)
- = 84% (1) correct answer with or without working gets 2 marks

15. [2]

- most people are immune so the pathogen cannot spread easily (1)
- unvaccinated people are less likely to come into contact with someone who is infected (1)

16. [3]

- antibiotics cannot kill viruses / viral pathogens (1) allow antibiotics only kill bacteria
- so the antibiotic would not cure the disease (1)
- viruses live and reproduce inside cells (1)
- difficult to kill viruses without damaging the body's tissues (1)
- Max 3

17. [3]

- foxgloves (1)
- willow (1)
- Penicillium mould (1) allow Penicillium

18. [4]

- preclinical testing is done in a laboratory (1)
- using cells, tissues and live animals (1)
- clinical trials use healthy volunteers and patients (1)
- very low doses given at the start (1)
- if safe, further trials to find the optimum dose (1)
- Max 4

19. [6]

Level 3 5-6	A clear, detailed and logical description that covers where drugs come from, preclinical testing, clinical trials including dose and placebo, and peer review. Correct scientific terms are used.
Level 2 3-4	A description that covers most stages in a sensible order but with some gaps or a lack of detail about what each stage tests.
Level 1 1-2	A few simple, separate points about testing a drug, with little detail or order.

Indicative content

- drugs may be extracted from plants or microorganisms or synthesised by chemists in the pharmaceutical industry
- new drugs must be tested to check they are safe and effective
- tested for toxicity, efficacy and dose
- preclinical testing in a laboratory using cells, tissues and live animals
- clinical trials use healthy volunteers and patients
- very low doses given first; if safe, further trials to find the optimum dose
- double blind trials: some patients given a placebo
- results published only after peer review