1.2 Pathogens and viruses

Name: _____ Class: _____ Date: _____ **Total: 22 marks**

KEY WORDS pathogen • protein coat • parasitic

Objective

Understand pathogens (1.4): which groups can cause disease, and the structure and named examples of viruses. Original IGCSE-level practice for specification 4BI1 Section 1(b).

1 Key knowledge and worked examples

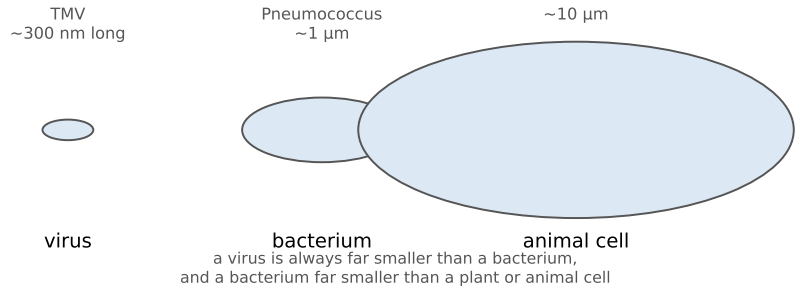
■ A pathogen is a disease-causing organism or particle

Fungi, bacteria, protoctists **or viruses** – all four can be pathogens. Named cases to recall: *Pneumococcus* (bacterium, pneumonia), *Plasmodium* (protoctist, malaria), and the three viruses.

■ Viruses are not alive

They are **small particles, smaller than bacteria**; **parasitic**; **reproduce only inside living cells**; have **no cellular structure** – a **protein coat** around **one type of nucleic acid (DNA or RNA)**. They infect every type of living organism.

Virus	Disease	Effect
Tobacco mosaic virus	discoloured tobacco leaves	prevents chloroplasts forming
Influenza virus	flu	–
HIV	AIDS	–



2 Practice

2.1 Define the term pathogen, listing the four groups the specification allows. [2]

2.2 Give three reasons why a virus is not classified as a living organism. [3]

2.3 State what is found inside a virus particle, and what surrounds it. [2]

2.4 Name the virus that attacks tobacco plants and describe the appearance of an infected leaf. [2]

3 Exam-style questions

3.1 A student writes: "Bacteria are the smallest pathogens and always cause disease." Correct both errors. [3]

3.2 Explain why a virus cannot reproduce on a glass surface, referring to its structure. [3]

3.3 *Plasmodium*, *Pneumococcus* and HIV all cause disease. Identify the group of each pathogen and one named disease symptom or effect for one of them. [4]

3.4 A particle seen with an electron microscope measures 200 nm across, shows a protein coat surrounding RNA, and has no cytoplasm. Deduce whether it is a virus or a bacterium, giving two reasons from your observations. [3]