

Life Sciences, Grade 11, Microorganisms

Written questions

Question 1: Fungi and Their Characteristics

Answers to Written Questions

Question 1: Fungi and Their Characteristics

1.1 **Hyphae** are threads that make up the structure of fungi. When these threads are interwoven, they are collectively called a **mycelium**.

1.2 Fungi obtain food as **heterotrophs** in two main ways:

Saprophytes: They obtain food from **dead organic matter** in their environment.

Parasites: They feed on **living organisms** at the expense of the host.

1.3 Fungi reproduction:

Under **favourable conditions** (warm, dark, moist), fungi reproduce **asexually through spore formation**.

Under **unfavourable conditions**, they reproduce **sexually through gamete formation**. They also alternate between gametophyte and sporophyte generations.

Question 2: Viruses and Bacteria

2.1 Viruses are considered acellular and non-living for the following reasons:

- * They are **not cells**; they are acellular.
- * They **do not perform the 7 life processes (MRS GREN)**: movement, respiration, sensitivity, growth, reproduction, excretion, nutrition.
- * They are **inactive unless in a host cell** (intracellular parasites) and can only replicate or reproduce within specific host cells.

2.2 A **capsid** is a protein coat that encloses the strand of DNA or RNA in a virus. **Capsomeres** are the protein subunits that make up this protein sheath (capsid) of a virus.

2.3 Bacteria are **ubiquitous** meaning they can **live in many different habitats**. They reproduce asexually primarily by **budding** and **simple binary fission**.

2.4 **Plasmid** are DNA molecules in bacteria that are not part of the main chromosomes and can be passed from bacteria to bacteria through **conjugation**.

Pili are organs used specifically during conjugation for the **partial transfer of DNA** from one bacterial cell to another, facilitating a form of sexual reproduction.

Question 3: Microbial Diseases and Immunity

3.1 Thrush is a medical condition caused by a yeast-like fungus, **Candida albicans**, which overgrows in moist bodily areas like the mouth, throat, vagina, nails, or skin.

Two common symptoms are: **fluffy, white patches** and **itching/soreness around the vagina entrance** (if vaginal thrush).

3.2 Malaria is caused by 4 species of protists (e.g., *Plasmodium vivax* and *P. falciparum*) and requires a **vector** to spread, typically the **female Anopheles mosquito**.

Two management/prevention strategies for malaria are: **wearing long-sleeved shirts/using insect repellent** and **draining mosquito breeding areas**.

3.3 **Naturally acquired immunity** is developed after an individual has had a disease, for example, developing immunity to chickenpox after having the infection.

Artificially acquired immunity is developed through **vaccination**, which involves deliberate exposure to a harmless form of a pathogen (antigen) to stimulate the immune system to produce antibodies.