

Life Sciences, Grade 11, Biodiversity of Animals

Written questions

Question 1: Animal Classification and Body Plans

1.1 **Cephalisation** is the concentration of sensory organs and a brain at the anterior (head) end of an organism. Its significance lies in allowing for directed movement and efficient interaction with the environment, as sensory information can be processed more effectively at the leading end.

1.2 **Diploblastic** organisms have two primary germ layers: the ectoderm and the endoderm. **Triploblastic** organisms have three primary germ layers: the ectoderm, the mesoderm, and the endoderm.

1.3 The three main types of coeloms (body cavities) are: * **Acoelomate**: An organism without a body cavity. * **Pseudocoelomate**: An organism with a body cavity not fully lined by mesoderm. * **Coelomate**: An organism with a true coelom (a fluid-filled body cavity completely lined by mesoderm).

Question 2: Invertebrate Phyla and Characteristics

2.1 For Phylum Porifera (sponges), two distinguishing characteristics are: * They are **asymmetrical**, meaning they have no symmetry. * They are **sessile**, meaning they are fixed in one place. * They are **diploblastic**, having two primary germ layers. * They have **no gut**. * They have **pores (ostia)** through which water enters, and an **osculum** through which water exits.

2.2 **Phylum Cnidaria** (e.g., jellyfish, corals) exhibit **radial symmetry** and have **no through gut**. **Phylum Platyhelminthes** (flatworms) exhibit **bilateral symmetry** and also have **no through gut** (they have a blind gut).

2.3 Three key characteristics common to all organisms belonging to Phylum Arthropoda are: * They have **many jointed legs**. * They have a **segmented body**. * They possess an **exoskeleton made of chitin**. * They have a **waterproof cuticle**. * They possess a **coelom**.

Question 3: Invertebrates in Agriculture

3.1 The **Grazer Niche** refers to the role in an ecosystem for organisms that feed on plants, controlling plant growth. An example of an invertebrate that fills this role is **locusts** or **harvester termites**.

3.2 Invertebrates contribute to "Decomposition and Recycling" in agricultural ecosystems in ways such as: * **Fly larvae** eating carcasses, thus breaking down dead organic matter. * **Earthworms** recycling faeces, which acts as a fertilizer, and helping to aerate the soil. * **Fungi** (though technically not invertebrates, they are mentioned in this context) recycling dead organic matter.

3.3 Invertebrates are crucial in agriculture for: * **Pest Control**: Farmers use **biological control methods**, such as parasitic wasps that lay eggs in cabbage moth pests to destroy them. Predatory arthropods like spiders and ladybugs also feed on other arthropods, controlling pest populations. * **Plant Pollination**: Many plants depend on invertebrates, such as **bees, butterflies, and flying beetles**, for the transfer of pollen, which is essential for plant reproduction. Some plants may even depend on a single species for pollination.