5. HABITAT AND ADAPTATIONS

TEACHING TASK (Page 51 – 52)

Multiple Choice Questions

1) Which of the following best describes a habitat? Answer: A) The physical space where an organism lives Explanation: A habitat is the specific area or environment where an organism naturally lives, including both biotic (living) and abiotic (non-living) components.

2) Which of the following is an example of a biotic factor? Answer: C) Plants Explanation: Biotic factors are living components of an ecosystem, such as plants, animals, and microorganisms. Soil, sunlight, and water are abiotic (non-living) factors.

3) Which of the following animals is most likely to be found in a terrestrial habitat? Answer: C) Elephant Explanation: A terrestrial habitat is land-based. Elephants live on land (e.g., grasslands, forests), while sharks, dolphins, and octopuses are aquatic.

4)Which of the following is a terrestrial habitat? Answer: C) Grassland Explanation: Grasslands are land-based (terrestrial) habitats. Coral reefs, oceans, and estuaries are aquatic habitats.

5) Aquatic habitats are characterized by: Answer: C) Presence of water Explanation: Aquatic habitats are defined by the presence of water, such as oceans, rivers, or lakes, supporting aquatic life.

Advanced Level: More Than One Answer Type

6) Which of the following are threats to terrestrial habitats? Select all that apply. Answer: A) Deforestation, B) Pollution, C) Overgrazing

Explanation: Deforestation, pollution, and overgrazing directly degrade terrestrial habitats by removing vegetation, contaminating soil, or overusing resources. Ocean acidification primarily affects aquatic habitats.

7) Which of the following are examples of abiotic factors in an ecosystem? Select all that apply. Answer: B) Sunlight, C) Temperature Explanation: Abiotic factors are non-living components like sunlight and temperature. Plants and soil microorganisms are biotic (living) factors.

Fill in the Blanks

8) The characteristics of a habitat include both _____ and abiotic factors. Answer: biotic Explanation: Habitats are defined by both biotic (living, e.g., plants, animals) and abiotic (non-living, e.g., water, sunlight) factors.

9) The interaction between organisms and their _____ shapes the characteristics of a habitat. Answer: environment Explanation: Organisms interact with their environment (both biotic and abiotic components) to shape the habitat's characteristics.

Matching Type

10) Match the terms:

Aquatic Habitat → **C. estuaries**

Terrestrial Habitat → **A. tundra**

Habitat Destruction → **B. urbanization**

Explanation: Estuaries are aquatic habitats (transitional zones between rivers and seas), tundra is a terrestrial habitat, and urbanization is a form of habitat destruction.

Answer the Following Questions

11) Can you give examples of different types of habitats? Answer: Examples of habitats include:

Terrestrial habitats: Forests, grasslands, deserts, tundra.

Aquatic habitats: Oceans, rivers, lakes, coral reefs, estuaries.

Other habitats: Wetlands, mountains, polar regions. **Explanation:** Habitats vary by environmental conditions and can be broadly classified as terrestrial (land-based) or aquatic (water-based), with specific examples reflecting diverse ecosystems.

12) How can human activities affect habitats? Answer: Human activities can affect habitats through:

Deforestation: Clearing forests for agriculture or urban development destroys habitats.

Pollution: Contaminating air, water, or soil harms organisms and ecosystems.

Urbanization: Converting natural areas into cities reduces habitat availability.

Overgrazing: Excessive grazing by livestock degrades grasslands.

Climate change: Alters temperature and precipitation, affecting habitat suitability. **Explanation:** These activities disrupt the balance of ecosystems, reducing biodiversity and altering habitat conditions.

LEARNER'S TASK (Page 52 -53)

Multiple Choice Questions

1) What is a habitat? Answer: B) A specific geographic area where a particular species lives Explanation: A habitat is the specific area where a species lives and interacts with its environment, distinguishing it from broader ecological concepts.

2) A habitat can include: Answer: C) Both living and non-living components Explanation: Habitats include biotic (living, e.g., plants, animals) and abiotic (non-living, e.g., water, sunlight) components.

3) Which of the following is an abiotic factor? Answer: B) Temperature Explanation: Temperature is a non-living (abiotic) factor, while birds, bacteria, and trees are biotic.

4) Terrestrial habitats are characterized by: Answer: B) Being on land Explanation: Terrestrial habitats are land-based environments, such as forests or grasslands.

5) The term "terrestrial" refers to: Answer: C) Land-based environments Explanation: Terrestrial refers to land-based ecosystems, not aquatic, mountainous, or underground environments specifically.

6) The majority of Earth's surface is covered by which type of habitat? Answer: C) Aquatic Explanation: Approximately 71% of Earth’s surface is covered by water, making aquatic habitats (oceans, rivers, lakes) the most dominant.

Advanced Level: More Than One Answer Type

7) Which of the following are examples of biotic factors in a forest ecosystem? Select all that apply. Answer: A) Deer, C) Fungi Explanation: Deer and fungi are living (biotic) components. Rain and rocks are abiotic.

Fill in the Blanks

8) The distribution and abundance of species within a habitat are influenced by both _____ and _____ factors. Answer: biotic, abiotic Explanation: Species distribution is shaped by interactions with living (biotic) and non-living (abiotic) factors.

9)_____ habitats cover the majority of Earth's surface and include oceans, seas, rivers, and lakes. Answer: Aquatic Explanation: Aquatic habitats dominate Earth's surface due to the vast coverage of oceans and other water bodies.

Matching Type

10) Match the terms:

Abiotic Factors → **B. sunlight**

Biotic Factors → **C. microorganisms**

Habitat Diversity → **A. supporting a wide variety of species**
Explanation: Sunlight is an abiotic factor, microorganisms are biotic, and habitat diversity refers to the variety of species supported by different habitats.

Answer the Following Questions

11) What is a habitat? Answer: A habitat is the specific area or environment where an organism lives, including both living (biotic) and non-living (abiotic) components that support its survival and reproduction. **Explanation:** This definition emphasizes the interaction of organisms with their environment.

12) How can we conserve habitats? Answer: Habitat conservation can be achieved by:

Protecting natural areas: Establishing national parks or reserves.

Reducing pollution: Implementing cleaner technologies and waste management.

Reforestation: Planting trees to restore degraded habitats.

Sustainable practices: Promoting eco-friendly agriculture and urban planning.

Raising awareness: Educating communities about habitat preservation.
Explanation: These actions help maintain biodiversity and ecosystem health.

TEACHING TASK (Page 55 – 57)

Multiple Choice Questions

1) Adaptation helps organisms to: Answer: B) Survive and reproduce in their environment Explanation: Adaptations are traits or behaviours that enhance an organism's ability to survive and reproduce in its specific environment.

2) Which of the following adaptations helps desert plants reduce water loss? Answer: C) Thick, waxy coatings on leaves Explanation: Thick, waxy coatings reduce transpiration, helping desert plants conserve water.

3) What is the primary function of a camel's hump in desert adaptation? Answer: D) To store fat for energy during food scarcity Explanation: A camel's hump stores fat, which is metabolized for energy when food is scarce, not water.

4) Which behavioural adaptation helps desert animals avoid the hottest part of the day? Answer: C) Becoming nocturnal Explanation: Nocturnal behaviour allows animals to be active at night, avoiding extreme daytime heat.

5) Which of the following animals is well-adapted to life in grasslands? Answer: C) Giraffe Explanation: Giraffes are adapted to grasslands (savannas) with long necks for feeding on tall trees. Penguins, polar bears, and seals are suited to other environments.

Advanced Level: More Than One Answer Type

6) Which of the following are adaptations of desert animals to cope with extreme temperatures? Answer: A) Nocturnal behaviour to avoid daytime heat, D) Living in underground burrows to escape heat Explanation: Nocturnal behaviour and burrowing help avoid heat.

Insulating fur is more suited to cold environments, and basking increases heat exposure.

7) Which of the following are adaptations of grassland plants? Answer: A) Deep root systems to access water, C) Shedding leaves during dry periods to conserve water Explanation: Deep roots access underground water, and shedding leaves reduces water loss. Broad leaves and waxy coatings are less typical for grassland plants.

Fill in the Blanks

8) Some animals have adaptations that help them blend into their surroundings, a behaviour known as _____. Answer: camouflage Explanation: Camouflage is an adaptation that allows animals to blend into their environment to avoid predators or hunt.

9) The humps on a camel's back serve as a store of _____, not water. Answer: fat Explanation: Camel humps store fat for energy, not water.

Matching Type

10) Match the terms:

Hump → **B. Reservoir of fat**

Prairie dogs → **A. adapted to dig burrows**

Bison → **D. extract nutrients from tough grasses**

Cacti → **C. Modified leaves to spines**

Explanation: Camel humps store fat, prairie dogs dig burrows, bison have specialized digestive systems, and cacti have spines to reduce water loss.

Answer the Following Questions

11) How do camels store water in their bodies to survive in the desert? Answer: Camels conserve water through highly concentrated urine, minimal sweating, and efficient metabolism. They can also store water in their bloodstream and body tissues, allowing them to go long periods without drinking. **Explanation:** Camels are adapted to minimize water loss and maximize retention, not store water in their humps.

12) How do some desert plants, like cacti, adapt to minimize water loss through transpiration? Answer: Cacti minimize water loss through:

Spines instead of leaves: Reduces surface area for transpiration.

Thick, waxy skin: Prevents water evaporation.

Shallow, widespread roots: Quickly absorb rare rainfall. **Explanation:** These adaptations reduce water loss in arid environments.

13) What adaptation do grazing animals in grasslands have to efficiently eat grass? Answer: Grazing animals, like bison, have specialized teeth (e.g., flat molars) and digestive systems (e.g., multi-chambered stomachs in ruminants) to break down tough, fibrous grasses. **Explanation:** These adaptations allow efficient processing of low-nutrient grasses.

LEARNER'S TASK (Page 57 – 58)

Multiple Choice Questions

1) Adaptations help organisms to: Answer: C) Survive and reproduce in diverse environments Explanation: Adaptations enable organisms to thrive in varied conditions by enhancing survival and reproduction.

2) How do desert plants adapt to scarce water availability? Answer: A) By having deep root systems to reach underground water sources

Explanation: Deep roots access groundwater, a key adaptation for desert plants. Shedding leaves is less common, and moisture absorption through leaves is not typical.

3) Which of these animals is well-adapted to living in the desert? Answer: C) Camel Explanation: Camels are adapted to deserts with features like humps for fat storage and water conservation mechanisms.

4) What is the primary purpose of a camel's hump? Answer: D) To store fat for energy Explanation: The hump stores fat, which is used for energy during food scarcity.

5) Which of these adaptations is crucial for survival in grasslands? Answer: C) Ability to burrow underground Explanation: Burrowing helps grassland animals escape predators and harsh weather, a key adaptation for survival.

Advanced Level

More Than One Answer Type

6) Which adaptations help desert animals conserve water? Answer: A) Producing highly concentrated urine, B) Decreasing metabolic rate to reduce water loss, D) Developing thick, waterproof skin to prevent dehydration Explanation: These adaptations minimize water loss. Large surface areas (C) would increase evaporation, not conserve water.

Fill in the Blanks

7) Camels can go for long periods without _____, making them well-suited for desert life. Answer: water Explanation: Camels' water conservation adaptations allow them to survive without frequent drinking.

8) Grassland plants often have deep _____ systems to reach water underground. Answer: root Explanation: Deep roots access groundwater in dry grassland environments.

Matching Type

9) Match the terms:

Deep Roots → **C. survive in areas with unpredictable rainfall and frequent droughts**

Fire Resistance → **A. grasses have underground storage organs**

Camouflage → **B. fur coloration of grassland rodents**

Migration → **D. African savannas**

Explanation: Deep roots help plants survive droughts, fire-resistant grasses have underground organs, camouflage aids rodents in predator avoidance, and migration is common in savanna animals.

Answer the Following Questions

10) How do grassland plants adapt to survive in areas with limited water availability?

Answer: Grassland plants adapt by:

Deep root systems: Access underground water.

Drought-resistant structures: Like underground storage organs (e.g., rhizomes).

Shedding leaves: Reduces water loss during dry periods. **Explanation:** These adaptations help plants cope with sporadic rainfall.

11) What behavioural adaptation do some grassland animals exhibit to avoid predators? Answer: Grassland animals, like prairie dogs, exhibit **burrowing** to escape predators and **group vigilance** (e.g., meerkats) to detect threats early. **Explanation:** These behaviours enhance survival in open, predator-rich environments.

TEACHING TASK (Page 59 – 61)

Multiple Choice Questions

1) Which of the following is a common adaptation of rainforest animals to navigate through the dense canopy? Answer: C) Prehensile tails Explanation: Prehensile tails help animals like monkeys grip branches for navigation in the dense rainforest canopy.

2) Which adaptation helps certain rainforest plants to climb toward sunlight? Answer: C) Vining structures Explanation: Vining structures allow plants to climb trees to reach sunlight in the dense rainforest.

3) How do some rainforest plants cope with the challenge of excessive rainfall? Answer: A) By developing drip tips Explanation: Drip tips allow rainwater to run off leaves quickly, preventing fungal growth.

4) What adaptation do mountain animals have to keep warm in the cold climate? Answer: B) Growing thicker fur or feathers Explanation: Thick fur or feathers insulate mountain animals against cold temperatures.

5) What adaptation helps mountain animals grip onto rocks and steep slopes? Answer: B) Claws or sticky pads on their feet Explanation: Claws or sticky pads provide traction for navigating steep, rocky terrain.

Advanced Level

More Than One Answer Type

6) Which of the following are adaptations of rainforest plants to the dense canopy environment? Answer: A) Drip tips, C) Buttress roots, D) Epiphytic growth Explanation: Drip tips manage rainfall, buttress roots provide stability, and epiphytic growth allows plants to grow on others for sunlight. Prehensile tails are animal adaptations.

7) Which adaptations help rainforest organisms cope with excessive rainfall? Answer: A) Drip tips, B) Thick waxy coatings Explanation: Drip tips shed water, and waxy coatings prevent waterlogging and fungal growth. Deep roots are less relevant to rainfall management.

Fill in the Blanks

8) Rainforest plants often have _____ tips on their leaves to allow rainwater to run off quickly. Answer: drip Explanation: Drip tips facilitate quick water runoff to prevent fungal growth.

9) Many animals in the rainforest have developed _____ tails to help them navigate through the dense vegetation. Answer: prehensile Explanation: Prehensile tails are flexible and grasping, aiding movement in the canopy.

10) _____ allows certain mountain animals to blend in with their surroundings, helping them avoid predators. Answer: Camouflage Explanation: Camouflage helps mountain animals avoid detection by predators.

Matching Type

11) Match the terms:

Camouflage → **C. An adaptation seen in many rainforest animals, helping them blend in with their surroundings, either for hunting or avoiding predators.**

Epiphytic growth → **A. Plants that grow on other plants, relying on them for support while obtaining water and nutrients from the air.**

Drip tips → **B. Leaves with pointed tips that allow rainwater to run off quickly, preventing the growth of harmful fungi and bacteria.**

Nocturnal behaviour → **D. A behaviour exhibited by some rainforest animals to be primarily active at night, avoiding competition and predators.**

Explanation: Each term corresponds to a specific adaptation suited to the rainforest environment.

Answer the Following Questions

12) Why do you think some animals in the rainforest are active at night rather than during the day? Answer: Nocturnal behavior helps rainforest animals avoid competition for food, reduce predation risk, and cope with high daytime temperatures and humidity. **Explanation:** Night activity reduces interactions with diurnal predators and competitors.

13) Why do you think some plants in the rainforest grow on other plants instead of in the ground? Answer: Epiphytic plants grow on other plants to access sunlight in the dense canopy, where ground-level light is limited, and to avoid competition for soil nutrients. **Explanation:** This adaptation maximizes light exposure and resource efficiency.

14) How do you think an animal with thick fur or feathers would be better adapted to the cold mountain climate compared to an animal with thin fur? Answer: Thick fur or feathers provide insulation, trapping body heat to keep the animal warm in cold mountain climates, while thin fur offers less protection, making animals more susceptible to cold. **Explanation:** Insulation is critical for maintaining body temperature in low-temperature environments.

LEARNER'S TASK (Page 61 – 62)

Multiple Choice Questions

1) What adaptation do many rainforest animals have to blend in with their surroundings? Answer: C) Camouflage Explanation: Camouflage helps rainforest animals avoid predators or hunt by blending into the environment.

2) What adaptation allows certain rainforest animals to be primarily active at night? Answer: B) Nocturnal behaviour Explanation: Nocturnal behaviour reduces competition and predation in the dense rainforest.

3) How do some animals in the mountains cope with low oxygen levels? Answer: D) They have bigger lungs Explanation: Larger lungs increase oxygen intake, helping animals survive in high-altitude, low-oxygen environments.

4) How do animals like bears adapt to the scarcity of food in the mountains during winter? Answer: B) They hibernate Explanation: Hibernation conserves energy by reducing metabolic rate during food-scarce winter months.

5) How do some animals in the mountains store food for the winter? Answer: D) They store it in their dens or nests Explanation: Storing food in dens ensures a food supply during winter scarcity.

Advanced Level

More Than One Answer Type

6) Which of the following adaptations help rainforest plants to efficiently utilize sunlight? Answer: A) Vining structures, C) Broad leaves Explanation: Vining structures help plants climb toward sunlight, and broad leaves maximize light absorption. Deep roots and short growing seasons are less relevant.

7) Which of the following are adaptations of mountain animals to cope with the cold climate? Answer: A) Thick fur or feathers, B) Hibernation during winter Explanation: Thick fur insulates against cold, and hibernation conserves energy during winter. Shedding fur and moving faster are not cold adaptations.

Fill in the Blanks

8) Some animals in the rainforest have developed _____ behaviour, becoming primarily active at night to avoid competition and predators. Answer: nocturnal Explanation: Nocturnal behaviour is a key adaptation for avoiding daytime threats.

9) _____ is a common adaptation of mountain animals to cope with the cold climate, helping them stay warm. Answer: Thick fur or feathers Explanation: Insulation from thick fur or feathers is critical for warmth in cold climates.

Matching Type

10) Match the terms:

Hibernation → **B. A behaviour observed in some mountain animals to conserve energy during the winter months when food is scarce**

Thick fur or feathers → **A. Physical feature found in mountain animals to keep them warm in cold climates**

Strong grip → **D. An adaptation seen in many mountain animals to help them navigate steep slopes and rocky terrain**

Broad, flat leaves → **C. Plant adaptation to maximize sunlight absorption in mountain environments Explanation:** Each term corresponds to a specific adaptation for mountain survival.

Answer the Following Questions

11) Imagine you're a frog living in the rainforest. How would your bright colours help you survive? Answer: Bright colours in rainforest frogs often signal toxicity (warning coloration) to deter predators, increasing survival chances. **Explanation:** Aposematic coloration warns predators of potential danger, reducing predation.

12) How do you think a plant with drip tips would be different from a plant without them? Answer: A plant with drip tips sheds rainwater quickly, preventing fungal growth and waterlogging, while a plant without drip tips may retain water, increasing the risk of disease in humid rainforests. **Explanation:** Drip tips are an adaptation to high-rainfall environments.

13) Imagine you are a mountain goat. How would your strong grip help you climb steep slopes and rocky terrain? Answer: A strong grip, provided by specialized hooves or claws, allows a mountain goat to maintain traction and balance on steep, rocky slopes, preventing falls and aiding movement. **Explanation:** This adaptation ensures safe navigation in rugged mountain environments.

TEACHING TASK (Page 64 – 65)

Multiple Choice Questions

1) How do freshwater fish breathe? Answer: A) Through gills Explanation: Gills extract oxygen from water, enabling freshwater fish to breathe.

2) What is the purpose of a fish's swim bladder? Answer: C) To regulate buoyancy Explanation: The swim bladder adjusts buoyancy, allowing fish to maintain their depth in water.

3) What is the primary purpose of the root systems of freshwater plants? Answer: A) To anchor the plant in the substrate Explanation: Roots anchor freshwater plants in the substrate to withstand water currents.

4) What structure do some marine animals use to change their buoyancy and control their depth in the water? Answer: A) Swim bladder Explanation: Swim bladders, found in many fish, regulate buoyancy for depth control.

Advanced Level

More Than One Answer Type

5) Which of the following adaptations help freshwater fish survive in their environment? Answer: A) Gills for breathing, B) Streamlined bodies for swimming Explanation: Gills enable oxygen extraction, and streamlined bodies reduce water resistance. Buoyant blubber and webbed feet are more relevant to marine mammals or birds.

6) What are some adaptations of freshwater plants for survival? Answer: A) Anchoring roots, B) Air-filled bladders for buoyancy, C) Flexible stems and leaves Explanation: Anchoring roots stabilize plants, air-filled bladders aid flotation, and flexible stems prevent damage in currents. Spiny thorns are not typical for freshwater plants.

Fill in the Blanks

7) Freshwater fish use their _____ to extract oxygen from the water. Answer: gills Explanation: Gills are specialized organs for aquatic respiration.

8) Aquatic plants have _____ to anchor them in the soil at the bottom of lakes and rivers. Answer: roots Explanation: Roots secure plants against water currents.

Matching Type

9) Match the terms:

Floating Leaves → **B. solar panels for the plants**

Flexible Stems and Leaves → **C. avoid getting broken or uprooted during floods**

Air Spaces → **A. help them float and stay buoyant in the water**
Explanation: Floating leaves maximize photosynthesis, flexible stems resist currents, and air spaces provide buoyancy.

Answer the Following Questions

10) Explain about animal adaptations in freshwater.

Answer: Freshwater animals have adaptations such as:

Gills: Fish use gills to extract oxygen from water.

Streamlined bodies: Reduce resistance for efficient swimming (e.g., fish, otters).

Webbed feet: Aid swimming in animals like ducks and otters.

Buoyancy control: Swim bladders in fish regulate depth.

Camouflage: Blending with surroundings to avoid predators (e.g., frogs).
Explanation: These adaptations enhance survival in dynamic freshwater environments.

LEARNER'S TASK (Page 65 – 66)

Multiple Choice Questions

1) What structures do aquatic plants have to help them stay anchored in freshwater habitats? Answer: B) Strong roots Explanation: Strong roots anchor aquatic plants against currents in freshwater habitats.

2) How do floating leaves of aquatic plants help them survive? Answer: A) They absorb sunlight for photosynthesis Explanation: Floating leaves maximize light exposure for photosynthesis.

3) What adaptation allows some freshwater plants to survive in flowing streams and rivers? Answer: B) Flexible stems Explanation: Flexible stems bend with water flow, preventing breakage.

4) What is the purpose of air spaces in the tissues of aquatic plants? Answer: B) To provide buoyancy Explanation: Air spaces help aquatic plants float to access sunlight.

5) What adaptation allows dolphins to swim at high speeds? Answer: B) Streamlined bodies Explanation: Streamlined bodies reduce water resistance, enabling fast swimming.

Advanced Level: More Than One Answer Type

6) What are some adaptations of freshwater plants for living in flowing rivers? Answer: A) Flexible stems, B) Anchoring roots, D) Floating leaves Explanation: Flexible stems resist breaking, anchoring roots secure plants, and floating leaves aid buoyancy and photosynthesis. Air-filled bladders are less critical in flowing rivers.

Fill in the Blanks

7) Certain freshwater plants have _____ to float on the surface of ponds and lakes, allowing them to access sunlight for photosynthesis. Answer: floating leaves Explanation: Floating leaves ensure access to sunlight for photosynthesis.

8) Ducks, otters, and other animals that live in or near freshwater often have _____ that help them swim and paddle through the water. Answer: webbed feet Explanation: Webbed feet enhance swimming efficiency.

Matching Type

9) Match the terms:

Webbed Feet → **C. built-in flippers**

Shells → **B. protect them from predators**

Streamlined Bodies → **A. less resistance to water Explanation:** Webbed feet aid swimming, shells provide protection, and streamlined bodies reduce water resistance.

Answer the Following Questions

10) Explain about plant adaptations in ocean. Answer: Ocean plants (e.g., seagrasses, algae) have adaptations such as:

Anchoring roots or holdfasts: Secure plants to the ocean floor against currents (e.g., seagrasses).

Flexible stems and blades: Bend with waves to avoid breaking (e.g., kelp).

Buoyant structures: Gas-filled bladders (e.g., in kelp) keep fronds near the surface for sunlight.

Salt tolerance: Specialized cells manage high salinity.

Efficient photosynthesis: Broad surfaces or pigments maximize light capture in low-light underwater conditions. **Explanation:** These adaptations allow ocean plants to thrive in saline, dynamic environments with limited light and strong currents.