2. GETTING TO KNOW ABOUT PLANTS

TEACHING TASK: KEY AND SOLUTIONS
Multiple Choice Questions
1.In what ways are herbs commonly used?
Answer: B. For their flavor in cooking, healing properties in medicine, and for fragrance and beauty in gardens
Explanation: Herbs are small plants valued for their flavorful leaves, stems, or seeds used in cooking (e.g., basil, parsley), medicinal properties (e.g., aloe, mint), and ornamental qualities in gardens for fragrance and beauty. Options A, C, and D (building materials, shade, furniture) are not typical uses of herbs.

2.Which of the following is NOT true about herbs?
Answer: C. They have woody stems.
Explanation: Herbs are characterized by soft, green, and tender stems, not woody stems, which are typical of shrubs and trees. Options A (lifespan can be annual, biennial, or perennial), B (low in height), and D (small plants) are true characteristics of herbs.

3.Where can you commonly find different types of plants?
Answer: B. Near our homes, in schoolyards, on the way to school, and in parks and gardens
Explanation: Plants, including herbs, shrubs, and trees, are commonly found in various environments such as homes, schoolyards, parks, and gardens. Options A (only forests), C (only botanical gardens), and D (only tropical regions) are too restrictive.

4.What characteristic is common to trees but not to shrubs or herbs?
Answer: b) Single main trunk
Explanation: Trees typically have a single main trunk covered with bark, which distinguishes them from shrubs (multiple stems from the base) and herbs (soft, tender stems). Option a (woody stems) applies to both trees and shrubs, c (multiple stems) is characteristic of shrubs, and d (attractive flowers) can apply to all plant types.

5.How do shrubs contribute to landscaping and gardens?
Answer: d) Serving as decorative borders
Explanation: Shrubs are widely used in landscaping to create decorative borders due to their attractive foliage and flowers. Option a (providing wood) is more typical of trees, b (absorbing CO_2) is a general plant function, and c (offering shade) is primarily associated with trees.

6.Which of the following is NOT a characteristic of trees?
Answer: c) Typically have multiple stems growing from the base
Explanation: Trees are characterized by a single main trunk, not multiple stems, which is typical of shrubs. Options a (single trunk with bark), b (can grow over 100

meters), and d (long lifespan) are true for trees.

7.What role do trees play in the environment?
Answer: b) Offering habitats for animals and absorbing carbon dioxide
Explanation: Trees provide habitats for numerous animals and absorb CO, during photosynthesis, contributing to environmental balance. Options a (decorative borders) and c (growing 1-3 meters) apply to shrubs, and d (multiple stems) is incorrect for trees.

8.Which plant category includes plants with small and tender stems?
Answer: c) Herbs
Explanation: Herbs are defined by their small size and soft, green, tender stems. Shrubs and trees have woody stems, and "all of the above" is incorrect as only herbs fit this description.

ADVANCED LEVEL QUESTIONS: KEY AND SOLUTIONS
More than One Answer Type
10. Which of the following statements are true about herbs?
Options:
A. They have woody stems.
B. They have soft, green, and tender stems.
C. They are usually low in height.
D. They are typically more than one meter tall.
Answer: B, C
Explanation:
A. They have woody stems: Incorrect. Herbs are characterized by soft, green, and tender stems, not woody stems, which are typical of shrubs and trees.
B. They have soft, green, and tender stems: Correct. This is a defining characteristic of herbs, distinguishing them from shrubs and trees.
C. They are usually low in height: Correct. Herbs are typically small plants, usually less than one meter tall.
D. They are typically more than one meter tall: Incorrect. Herbs are generally shorter than one meter, unlike shrubs (1-3 meters) or trees (often much taller).
Solution: Herbs are small plants with soft, tender stems and are usually low in height, making B and C the correct choices.

11. Which of the following are characteristics of shrubs?
Options:
A) Height usually between one meter and three meters.
B) Single stem growing from the base.
C) Woody stems.
D) Typically taller than trees.
Answer: A, C
Explanation:
A. Height usually between one meter and three meters: Correct. Shrubs are medium-sized plants, typically ranging from 1 to 3 meters in height.
B. Single stem growing from the base: Incorrect. Shrubs typically have multiple

stems growing from the base, unlike trees, which have a single main trunk.
C. Woody stems: Correct. Shrubs have woody stems, distinguishing them from herbs, which have soft, tender stems.
D. Typically taller than trees: Incorrect. Shrubs are shorter than trees, which are the largest and tallest type of plants.
Solution: Shrubs are characterized by their medium height (1-3 meters) and woody stems, making A and C the correct choices.

Reason and Assertion Type
Options for Reason and Assertion:
(A) Both A and R are true, and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

12. Assertion (A): Shrubs are often used in landscaping for their attractive flowers.
Reason (R): Shrubs are usually between one meter and three meters tall.
Answer: (B) Both A and R are true, but R is not the correct explanation of A.
Explanation:
Assertion (A): True. Shrubs, such as hibiscus or roses, are commonly used in landscaping due to their attractive flowers and foliage, which enhance garden aesthetics.
Reason (R): True. Shrubs typically range in height from 1 to 3 meters, which is a defining characteristic.
Explanation Check: While both statements are true, the reason (height of shrubs) does not explain why shrubs are used in landscaping for their attractive flowers. The use in landscaping is due to their aesthetic qualities (flowers, foliage), not their height.
Solution: Both A and R are true, but R does not explain A, so the answer is (B).

13. Assertion (A): Mint, basil, and parsley are examples of herbs.
Reason (R): Herbs are usually low in height and have woody stems.
Answer: (C) A is true, but R is false.
Explanation:
Assertion (A): True. Mint, basil, and parsley are classic examples of herbs, used for their flavorful leaves and tender stems.
Reason (R): False. Herbs are usually low in height, but they do not have woody stems; they have soft, green, and tender stems. Woody stems are characteristic of shrubs and trees.
Explanation Check: Since the reason contains an incorrect statement about herbs having woody stems, it is false, while the assertion is true.
Solution: A is true, but R is false, so the answer is (C).

Matrix Matching Type
14. Match the following:
Herbs
Shrubs
Trees
Options:
A. Often used in landscaping
B. Used in cooking for their flavor
C. Provide wood for construction, paper, etc.
Answer:
Herbs – B. Used in cooking for their flavor
Shrubs – A. Often used in landscaping
Trees – C. Provide wood for construction, paper, etc.
Explanation:
Herbs: Herbs like mint, basil, and parsley are primarily used in cooking for their flavorful leaves or stems, making B the correct match.
Shrubs: Shrubs, such as hibiscus or roses, are frequently used in landscaping for their attractive flowers and foliage, making A the correct match.
Trees: Trees like oak or pine provide wood for construction, paper, and other uses, making C the correct match.
Solution: The correct matches are 1-B, 2-A, 3-C.

Comprehension Type

Comprehension Context:
Herbs are small and tender.
Shrubs are medium-sized with woody stems.
Trees are large with a single main trunk.

15. Which of the following best describes herbs?
Options:
A) Medium-sized with woody stems.
B) Large with a single main trunk.
C) Small and tender.
D) Large and bushy.
Answer: C) Small and tender.
Explanation: According to the comprehension, herbs are defined as small plants with tender (soft, green) stems, which matches option C.
A: Incorrect, as this describes shrubs.
B: Incorrect, as this describes trees.
D: Incorrect, as herbs are not large or bushy; bushy characteristics align more with shrubs.
Solution: Herbs are best described as small and tender, so the answer is C.

16. What distinguishes trees from shrubs and herbs?
Options:
A) Trees are small and tender.
B) Trees are medium-sized with woody stems.
C) Trees have a single main trunk and are large.
D) Trees are medium-sized with a single soft stem.
Answer: C) Trees have a single main trunk and are large.
Explanation: The comprehension states that trees are large with a single main trunk, which distinguishes them from herbs (small, tender stems) and shrubs (medium-sized, multiple woody stems).
A: Incorrect, as this describes herbs.
B: Incorrect, as this describes shrubs (medium-sized, woody stems).
D: Incorrect, as trees do not have soft stems; they have woody stems and a single trunk.
Solution: Trees are distinguished by their large size and single main trunk, so the answer is C.

LEARNERS TASK: KEY AND SOLUTIONS

Multiple Choice Questions
1.What is a characteristic feature of herbs?
Answer: B. They are typically less than one meter tall.
Explanation: Herbs are small plants, typically under one meter, with soft, tender stems. They do not have woody stems, red leaves, or a universal lack of flowers.

2.Which of the following is NOT an example of an herb?
Answer: C. Rose
Explanation: Mint, basil, and parsley are herbs with soft stems used in cooking or medicine. Rose is a shrub with woody stems.

3.What types of plants are characterized by having soft, green, and tender stems?
Answer: C. Herbs
Explanation: Herbs have soft, green, tender stems, unlike trees and shrubs (woody stems) or vines (climbing stems).

4.Which of the following best describes shrubs?
Answer: b) Medium-sized plants with woody stems
Explanation: Shrubs are medium-sized (1-3 meters) with woody stems, distinguishing them from herbs (small, tender), trees (large, single trunk), and plants with long lifespans (trees).

5.What is the typical height range for shrubs?
Answer: b) Between one meter and three meters
Explanation: Shrubs typically grow between 1 and 3 meters, unlike herbs (<1 meter) or trees (>10 meters in some cases).

6.Which of the following plants is an example of a shrub?
Answer: b) Hibiscus
Explanation: Hibiscus is a shrub with woody stems. Oak, maple, and pine are trees with single trunks.1

7.Which plant is known for having a lifespan that can span decades or even centuries?
Answer: b) Pine
Explanation: Pine is a tree with a long lifespan (decades to centuries). Rose, hibiscus, and bougainvillea are shrubs with shorter lifespans.

8.Which plant provides berries and other edible parts in addition to having attractive flowers?
Answer: c) Shrubs
Explanation: Shrubs like blueberry or raspberry produce edible berries and have attractive flowers, unlike herbs (culinary leaves) or trees (fruits, not berries typically).

Advanced Level Questions
9.Which of the following are characteristics of herbs? (Select all that apply)
Answer: A. Lifespan can be annual, biennial, or perennial, B. Typically less than one meter tall, D. Soft, green, and tender stems
Explanation: Herbs have soft, tender stems, are typically under 1 meter, and can have annual, biennial, or perennial lifespans. Tall, robust trunks are characteristic of trees.

10.What are some common uses of shrubs? (Select all that apply)
Answer: A) Used in landscaping and gardens, C) Decorative borders, D) Produce berries and other edible parts
Explanation: Shrubs are used for landscaping, decorative borders, and producing edible berries (e.g., blueberries). Timber production is primarily associated with trees.

11.Assertion: Herbs do not have woody stems.
Reason: Herbs are typically low in height and have soft, green, and tender stems.
Answer: (A) Both A and R are true, and R is the correct explanation of A.
Explanation: Herbs lack woody stems, having soft, tender stems instead, and the reason explains this by describing their characteristic features.

12.Assertion: Trees are the largest and tallest type of plants.
Reason: Trees provide wood for construction, paper, fruits, oxygen, shade, and habitats for many animals.
Answer: (B) Both A and R are true, but R is not the correct explanation of A.

Explanation: Trees are the largest and tallest plants, and they provide the listed benefits, but these functions do not explain their size.

Matrix Matching Type
13.1. Herbs – B. Small plants with soft, green, and tender stems
2. Shrubs – C. Medium-sized plants with woody stems
3. Trees – A. The largest and tallest type of plants
Explanation: Herbs are small with tender stems, shrubs are medium-sized with woody stems, and trees are large with a single trunk.

14.What is the main characteristic of shrubs?
Answer: B) Medium-sized with woody stems
Explanation: Shrubs are defined by their medium height (1-3 meters) and woody stems, distinguishing them from herbs (tender stems) and trees (single trunk).

15.Which type of plant has a single main trunk?
Answer: C) Trees
Explanation: Trees are characterized by a single main trunk, unlike herbs (tender stems), shrubs (multiple stems), or grasses (no woody stems).

TEACHING TASK: KEY AND SOLUTIONS

NEET LEVEL QUESTIONS

Multiple Choice Questions
1.What is the function of nodes in stems?
Answer: d) Facilitating growth of leaves and flowers
Explanation: Nodes are the points on a stem where leaves, branches, and flowers originate. They are critical for the growth and development of these structures, as they contain meristematic tissue responsible for producing leaves and flowers.

2.Which type of stem stores food, making it edible for consumption?
Answer: c) Tuberous stems
Explanation: Tuberous stems, such as those found in potatoes, are specialized stems that store food in the form of starch, making them edible. Woody stems are hard and structural, herbaceous stems are soft but not primarily for storage, and rhizomatous stems spread horizontally but are not typically edible.

3.What process do stems contribute to, alongside leaves, in the production of food for the plant?
Answer: c) Photosynthesis
Explanation: Stems, especially green stems, contain chlorophyll and can perform photosynthesis, contributing to food production alongside leaves. They also transport water and nutrients needed for photosynthesis.

4.What is the primary function of leaves in plants?
Answer: b) Conducting photosynthesis
Explanation: Leaves are the primary sites for photosynthesis, where sunlight, water, and carbon dioxide are converted into glucose, the plant's food source. While leaves may store some nutrients, their primary role is photosynthesis.1

5.What is the role of chlorophyll in photosynthesis?
Answer: b) Capturing sunlight
Explanation: Chlorophyll, the green pigment in leaves, absorbs sunlight (primarily in the blue and red wavelengths), providing the energy needed for photosynthesis to convert water and carbon dioxide into glucose.

6.What is the function of veins in a leaf?
Answer: c) Transporting nutrients and sugars
Explanation: Veins in leaves contain xylem and phloem, which transport water, nutrients, and sugars (produced during photosynthesis) throughout the leaf and to other parts of the plant.

7.How do root hairs contribute to the function of roots?
Answer: c) They greatly increase the surface area for absorption
Explanation: Root hairs are tiny extensions of root epidermal cells that significantly increase the surface area for absorbing water and minerals from the soil, enhancing the plant's nutrient uptake efficiency.

8.What is the purpose of the taproot system?
Answer: c) It anchors the plant in the soil and absorbs water
Explanation: The taproot system, with one main root and smaller lateral roots, anchors the plant firmly in the soil and efficiently absorbs water and minerals due to its deep penetration.

9.Why are roots important for plants?
Answer: b) They provide support and stability
Explanation: Roots anchor the plant in the soil, providing structural support and stability, and absorb water and nutrients essential for growth. They do not directly aid in pollination or temperature regulation.

10.What happens after pollen lands on the stigma?
Answer: B) It travels down the style to the ovary
Explanation: After pollen lands on the stigma, it germinates and forms a pollen tube that travels down the style to the ovary, where fertilization of the ovules occurs, leading to seed formation.

11.Flowers that have both male and female reproductive parts are called:
Answer: A) Perfect flowers
Explanation: Perfect flowers (also called bisexual flowers) contain both male (stamen) and female (pistil) reproductive parts, allowing them to self-pollinate or cross-pollinate.

12.What is the role of sepals in a flower bud?
Answer: B) Protecting the flower bud before it blooms
Explanation: Sepals are green, leaf-like structures that enclose and protect the flower bud before it opens, shielding the delicate reproductive organs inside.

13.How do flowers contribute to the continuation of different plant species?
Answer: C) By producing seeds through fertilization
Explanation: Flowers facilitate reproduction by enabling pollination and fertilization, leading to the production of seeds that ensure the continuation of plant species.

14.What is the significance of flowers in human life?
Answer: B) They are used as symbols of love and friendship
Explanation: Flowers are widely used in human culture as symbols of emotions like love, friendship, and sympathy, and are commonly used in ceremonies, decorations, and gifting.

Advanced Level Questions
More than One Answer Type
15.Which functions are attributed to stems in plants? (Select all that apply)
Answer: a) Support, c) Transport, d) Storage
Explanation:
Support: Stems provide structural support, holding leaves and flowers in position.
Transport: Stems contain xylem and phloem, which transport water, nutrients, and sugars.
Storage: Some stems, like tuberous stems, store food and water.
Reproduction is not a primary function of stems, though some stems (e.g., runners) aid in vegetative propagation.

16.What are the main types of tubes found in stems responsible for transportation within plants? (Select all that apply)
Answer: a) Xylem, b) Phloem
Explanation:
Xylem: Transports water and minerals from roots to other parts of the plant.
Phloem: Transports sugars and other organic compounds produced during photosynthesis.
Cortex and **Epidermis** are not tubes; cortex stores nutrients, and epidermis is the outer protective layer.

Reason and Assertion Type

17.Assertion: Chlorophyll is essential for capturing sunlight energy during photosynthesis.
Reason: Chlorophyll, a green pigment in leaves, absorbs sunlight energy necessary for the chemical reactions of photosynthesis to occur.
Answer: A) Both A and R are true, and R is the correct explanation of A.
Explanation: Chlorophyll captures sunlight energy, which drives the chemical reactions of photosynthesis to produce glucose. The reason accurately explains the assertion.

18.Assertion: The blade of a leaf is where photosynthesis primarily takes place.
Reason: The broad, flat surface of the blade provides ample exposure to sunlight, facilitating the process of photosynthesis in leaf cells.
Answer: A) Both A and R are true, and R is the correct explanation of A.
Explanation: The leaf blade's broad, flat surface maximizes sunlight exposure, enabling efficient photosynthesis in the chloroplasts within leaf cells.

Matrix Matching Type

Match the following:
Answer:
19.1. Petals – B. These are the colorful parts of the flower that attract insects and other animals for pollination.
2. Sepals – A. These are the small green leaf-like structures found underneath the petals, protecting the flower bud before it blooms.
3. Stamen – C. The male reproductive part of the flower, consisting of the filament and the anther.
4. Pistil – D. The female reproductive part of the flower, consisting of the stigma, style, and ovary.
Explanation:
Petals attract pollinators with their color and shape.
Sepals protect the flower bud.
Stamen produces pollen (male gametes).
Pistil contains the female reproductive organs.

Comprehension Type
20.What is the primary purpose of photosynthesis in plants?
Answer: c) To convert sunlight, water, and carbon dioxide into glucose
Explanation: Photosynthesis uses sunlight, water (absorbed by roots), and carbon dioxide (taken in through stomata) to produce glucose, the plant's primary energy source. Oxygen release is a byproduct, not the primary purpose.

21.How do leaves obtain carbon dioxide for photosynthesis?
Answer: c) Through tiny openings called stomata
Explanation: Stomata are small pores on the leaf surface that allow carbon dioxide to enter for photosynthesis and oxygen to exit as a byproduct.

LEARNERS TASK

Multiple Choice Questions

1.What is the primary function of stems in plants?
Answer: b) Transporting nutrients
Explanation: While stems provide support, their primary function is transporting water, minerals, and sugars via xylem and phloem between roots, leaves, and other parts of the plant.

2.Which part of the stem carries water and minerals from the roots to the rest of the plant?
Answer: a) Xylem
Explanation: Xylem is the vascular tissue responsible for transporting water and minerals from the roots to the leaves and other parts of the plant.

3.Which type of stem is found in plants like tomatoes and dandelions?
Answer: b) Herbaceous stems
Explanation: Herbaceous stems are soft, green, and flexible, found in plants like tomatoes and dandelions, unlike woody stems (trees) or vascular/lignified stems (not standard terms).

4.What is the purpose of the petiole in a leaf?
Answer: c) Connecting the leaf to the stem
Explanation: The petiole is the stalk that attaches the leaf blade to the stem, allowing nutrient transport and positioning the leaf for optimal sunlight exposure.

5.Which type of venation has veins running parallel to each other?
Answer: c) Parallel venation
Explanation: Parallel venation, where veins run parallel from the base to the tip of the leaf, is characteristic of monocots like grasses. Netted/reticulate venation forms a network, typical of dicots.

6.Which pigment in leaves helps capture sunlight during photosynthesis?
Answer: c) Chlorophyll
Explanation: Chlorophyll is the primary pigment that absorbs sunlight for photosynthesis, unlike xanthophyll, anthocyanin, or carotenoids, which play secondary roles.

7.What is the primary function of roots in plants?
Answer: a) Providing support and stability
Explanation: Roots anchor the plant in the soil, providing support and stability, and absorb water and nutrients, but their primary role is anchorage.1

8.Which type of root system has one main root with smaller lateral roots branching off from it?
Answer: b) Taproot system
Explanation: The taproot system consists of one main root with smaller lateral roots, as seen in carrots, unlike fibrous (dense, shallow roots) or adventitious (roots from non-root tissue) systems.

9.What are root hairs?
Answer: b) Tiny hair-like structures on the surface of roots
Explanation: Root hairs are microscopic extensions of root epidermal cells that increase the surface area for water and nutrient absorption.

10.What is the primary function of petals in a flower?
Answer: C) Attracting insects for pollination
Explanation: Petals are colorful structures that attract pollinators like insects to facilitate pollination, not for producing pollen or protecting reproductive organs.

11.Which part of the flower consists of the stigma, style, and ovary?
Answer: C) Pistil
Explanation: The pistil is the female reproductive part of the flower, comprising the stigma (receives pollen), style (connects stigma to ovary), and ovary (contains ovules).

12.What is the male reproductive part of the flower called?
Answer: C) Stamen
Explanation: The stamen is the male reproductive part, consisting of the anther (produces pollen) and filament (supports the anther).

13.How is pollen transferred from one flower to another?
Answer: D) All of the above
Explanation: Pollen can be transferred by bees and other insects (biotic pollination), wind (abiotic pollination), or water (in some aquatic plants), depending on the plant species.

14.Where is pollen produced in a flower?
Answer: C) Anther
Explanation: The anther, part of the stamen, is the site where pollen grains (male gametes) are produced.

Advanced Level
More than One Answer Type
15.What are functions of roots in plants? (Select all that apply)
Answer: A) Providing support and stability, B) Absorbing water and nutrients from the soil, C) Preventing the plant from being easily blown over by wind or washed away by rain
Explanation:
Roots anchor the plant, providing support and stability (A).
They absorb water and nutrients (B).

By anchoring, they prevent the plant from being blown over or washed away (C).
Roots do not facilitate photosynthesis (D).

16.What are functions of roots in plants? (Select all that apply)
Answer: A) Anchoring the plant in the soil, B) Absorbing water and minerals from the soil
Explanation:
Roots anchor the plant (A) and absorb water and minerals (B).
They do not facilitate pollination (C) or conduct photosynthesis (D).

Reason and Assertion Type

17.Assertion: Leaves primarily make food for the plant through photosynthesis.
Reason: Photosynthesis is the process by which leaves convert sunlight, water, and carbon dioxide into glucose, the plant's food source.
Answer: A) Both A and R are true, and R is the correct explanation of A.
Explanation: Leaves are the primary sites of photosynthesis, producing glucose as the plant's food, and the reason correctly explains this process.

18.Assertion: Veins in leaves act as transport systems for water, nutrients, and sugars.
Reason: The veins distribute water, nutrients, and sugars throughout the leaf to support various metabolic processes, including photosynthesis.
Answer: A) Both A and R are true, and R is the correct explanation of A.
Explanation: Veins (xylem and phloem) transport water, nutrients, and sugars, supporting photosynthesis and other metabolic activities, as described in the reason.

Matrix Matching Type
Match the following:
Answer:
19.1. Pollination – B. The process of transferring pollen from the anther of one flower to the stigma of another flower.
2. Fertilization – A. The process where pollen fertilizes the ovules inside the ovary, leading to seed development.
3. Perfect flowers – D. Flowers that have both male and female parts.
4. Imperfect flowers – C. Flowers that have only one type of reproductive organ.
Explanation:
Pollination involves transferring pollen to the stigma.
Fertilization occurs when pollen reaches the ovules, forming seeds.
Perfect flowers have both stamen and pistil.
Imperfect flowers have either stamen or pistil, not both.

Comprehension Type

20.What is the function of veins in a leaf?
Answer: c) To carry water, nutrients, and sugars throughout the leaf
Explanation: Veins contain xylem (transports water and minerals) and phloem (transports sugars), distributing these substances throughout the leaf to support photosynthesis and other processes.

21.What is the role of the petiole in relation to the leaf?
Answer: c) To connect the leaf to the stem
Explanation: The petiole is the stalk that connects the leaf blade to the stem, facilitating nutrient transport and positioning the leaf for sunlight exposure