Course Code – SIUSACHOR62 – Credits 4 – Paper – II – Unit – I – Landscape Gardening (15 Lectures)
Indoor styles of garden – Bottle garden (Terrarium), Dish Garden, Bonsai
Important garden features – Path, Avenue, Hedge, Edge, Flower bed, Arches & Pergolas, Rock garden
Lawn – Purpose, Production of lawn, Methods of raising, lawn management, Lawn Plants
Mughal Garden, Buddhist Garden, Vertical Wall Garden, Theme Park

LANDSCAPE GARDENING

Bottle garden or Terrarium

Terrarium is a miniature garden in a closed glass container. When such garden is prepared in glass bottle, it is called Bottle garden. It is the easiest way of having indoor garden of charming little plants in a glass bottle or vessel. It requires little care and is easy to maintain. Growing plants in terrarium is a fascinating task. In such glass garden one can use one's imagination and creative power to create nature on a miniature scale. It is completely self-contained, neat and clean.

i. **Principle:** Bottle garden or Terrarium is an enclosed environment for the plants as the lid is always closed. Plants prepare their food by photosynthesis in presence of carbon dioxide and water and give out oxygen which is used during their respiration. During respiration, carbon dioxide and water in the form of water vapour are released out. The carbon dioxide is used up in photosynthesis and water vapour again forms water by condensation which is absorbed by the soil. Thus recycling of carbon dioxide, oxygen and water takes place in the closed bottle.

ii. **Containers used for Bottle garden:** There are many containers like large acid bottle, bowls, fish bowls, aquariums, confectionary jars and bottles of all shapes which can be used for terrarium. Container should be clear glass. It is always preferable to select transparent glass containers (crystal white) to unable the plants to show their colour.

iii. **Tools for Bottle garden:** If containers used are narrow mouthed then a few self made instruments are needed but in wide mouthed bottles working is easy with hands only. Some simple implements like spoon attached to a stick, empty cotton reel, thick wire, sponge or cotton , funnel, stiff paper gravel, forceps, rubber tube spray (for watering), umbrella stick, small cork (of a bottle), Blade, 500 ml plastic wash bottle etc. can be used for narrow mouthed terrarium.

iv. **Construction of Bottle garden:** Take a suitable container of glass or plastic and wash it thoroughly with water and then rinsed with dilute solutions of fungicides and pesticides. Allow it to dry. Then put a layer of gravel half inches thick or 4 – 5 pieces of broken bricks for drainage. It will hold excessive moisture which seeps down in level of soil. On the top of this put a layer of good, sterilized organic soil mixture consisting of Garden soil one part, brick and charcoal powder one part or vermiculite one part, leaf mould one part or cow dung manure half part. The soil should not be soggy. The thickness of this layer should be such that it enables the plants to grow roots. In narrow neck bottles use funnel to put soil in without dirtying side of the jar.

v. **Arrangement of plants:** Get all required plants and try out few arrangements outside the bowl so as to find out most attractive display. When you decide a type of arrangement, make a small hole in compost with funnel and drop plant gently into position, spread roots with the help of fork, cover them with soil and firm the roots with hammer. Plant all other plants in the same way. Planting is preferably done from outer periphery and big plants are placed on backside. Small pieces of stones and moss can enhance the beauty of display. After planting, spray just enough water to settle the plants, leaves terrarium uncovered for 2 – 3 days to see condition of plants. Then cover the container

to maintain humidity inside. Place terrarium in feeble light. Avoid direct sunlight as it tends to dry out quickly in such condition.

vi. **Plants used for Bottle garden:** Plants like *Peperomia*, *Croton*, *Pilea*, *Dracaena*, *Begonia*, *Oxalis, Selaginella,* Ferns etc., are suitable for terrarium. Select small plants with foliage but try to add at least one flowering plant. Moisture and shade loving plants are ideal for terrarium. Slow growing plants can be used to avoid too much pruning.

vii. **After Care**: The container should always remain covered, once the planting is done. However, in the interval of 2 months, bottle must be kept open for 2-3 hours, to supply fresh air. While opening, bottle must be covered with cloth to prevent infection. Watering should be done only after wilting of the plants. During watering add fungicide, pesticide and liquid manure to water. Light is necessary for terrarium but direct sunlight is harmful. Dead leaf or overgrowth from a plant can be removed with the help of the stick to which a broken razor blade is attached. A stick with some cotton at one end soaked in alcohol is inserted in the bottle to brush against insects if any. Following table gives the idea about common problems associated with terrarium:

Symptoms	Possible cause	Action
Yellowing of leaves	Poor drainage or inadequate fertility	Renew soil and ventilate for evaporation of excess water
Poor growth or stunting	Inadequate fertility or poor drainage	Replace soil and add organic fertilizers
Browning of foliage	Lack of moisture or burning from direct sunlight	Water plants and move away from direct sunlight
Odors	Decomposition of material or presence of nitrogenous fertilizer	Ventilate and add activated charcoal

DISH GARDEN

A dish garden is a garden of plants growing in a shallow dish or bowl instead of a large huge container. The dish garden can be landscaped to represent a scene in nature. In such glass garden one can use one's imagination and creative power to create ecosystem on a miniature scale. Growing plants in small shallow dish is an interesting task. It is the easiest way of having indoor garden of attractive little plants in a dish. It requires little care and is easy to maintain.

Requirements:

- **Container**: Glass or plastic dish with or without drainage holes / shallow fishbowl / glass vessel of any size.
- **Figurines and Stones:** Small pebbles, stones, gravel, rocks etc. for decoration.
- **Potting soil mixture:** Garden soil: Compost /Cow-dung/green-leaf Manure (2:1).
- **Plants:** Miniature/small sized slow growing plant can be selected. Commonly used plants for dish garden are *Peperomia*, *Croton*, *Pilea*, *Dracaena*, *Begonia*, *Oxalis, Selaginella, Aloe*, Ferns etc.
- **Other requirements:** Wire-mesh, coconut coir, Horticultural charcoal pieces and powder, Scissors, spray bottle, cotton, brush, spoon, sieves, news paper, forks etc.

Preparation of dish garden

- Choose a shallow container which is suitable for the dish garden.
- Wash it with soap water. Rinse it with fungicides and pesticides solution, dry it and use.
- Put half to one inch layer of gravel into the container. Add one to two tablespoons of charcoal to the gravel layer.
- Fill the container little below the top with potting soil mixture.

- Choose a group of healthy compatible plants of varied characteristics such as plants having different height, width, texture, colour, shapes etc. (3 plants for smaller sized container or 5 plants for the large one).
- Decide the aesthetically pleasing arrangement of plants based on how the dish garden will be viewed.
- Once the type of arrangement is decided, make small holes in the soil mixture and place the plants gently into their respective positions. Then cover the hole with extra soil and firm the plants in the soil.
- Then small pieces of stones, pebbles, gravels, rocks, animal figurines etc. can be added to enhance the beauty.
- Water the dish garden and place it in indirect sunlight.

After-care

- Light is necessary for dish garden but direct harsh sunlight is harmful.
- Inspect the plants for insect-pests and control them, if any.
- Remove old, yellow leaves, dead flowers and other unwanted plant material.
- Maintain the plants by prune them regularly.

Bonsai

Bonsai is the Japanese traditional technique which dates back over a thousand years. It is an art of cultivating miniature form of trees in a shallow container, using Japanese traditional principles. Bonsais are the plants with stunted growth which mimic the shape, foliage, flowering and fruiting pattern of full sized trees. Bonsai can be created from any woody perennial tree that produces true branches which withstand crown cutting and root pruning.

The Japanese art of bonsai making originated from the Chinese practice of 'Penjing'. Penjing are often landscapes made up of bonsais, whereas Bonsai is often an individual tree growing in the pot. One of the oldest-known living bonsai, which is considered as the National Treasures of Japan, is displayed at Tokyo Imperial Palace collection. Similarly, a five-needle pine (*Pinus pentaphylla*) which is at least 500 years old bonsai is also documented.

Technique: Bonsai shaping aesthetics, techniques and tools became increasingly sophisticated as bonsai's popularity grew in Japan and finally present day's technique got evolved. It involves following technique:

- **Leaf trimming:** It is the first step, which involves the selective removal of leaves or needles from a bonsai's trunk and branches.
- **Pruning**: The trunk, branches and roots of the tree are pruned.
- Wiring: It refers to tying of branches and trunks with a wire. This allows the bonsai creator to create the desired form of the bonsai and make detailed branch and leaf placements.
- **Clamping**: It is carried out by using mechanical devices used for shaping trunks and branches.
- **Grafting**: In it, new growing plant parts like buds, branches or root are grafted into a prepared area on the trunk or under the bark of the tree.
- **Defoliation:** It provides short-term dwarfing of foliage for certain deciduous species.
- **After-care**: Bonsai container is under 25 cm in its largest dimension. Wild trees grow up to 5 meters or taller whereas the largest bonsai rarely exceed 1 meter. These size

differences affect maturation, transpiration, nutrition, pest resistance, etc. and hence maintaining the long-term health of the bonsai requires specialized care. It is as follows:

- Watering must be regular and as per the plant type and requirement.
- Repotting must occur at intervals as per the requirement.
- Soil composition and fertilization must be adequate.
- Location and overwintering are species-dependent when the bonsai is kept outdoors.

Bonsai styles: The Japanese tradition describes bonsai tree designs as bonsai styles. The most common styles are as follows:

- **Formal upright** (*chokkan*): It is a style of trees characterized by a straight, upright, tapering trunk. Branches progress regularly from the thickest and broadest at the bottom to the finest and shortest at the top.
- **Informal upright** (*moyogi*): It is a style of trees incorporating visible curves in trunk and branches, but the apex of the informal upright is located directly above the trunk's entry into the soil line.
- **Slant** (*shakan*): It is a style of bonsai possessing straight trunks like formal upright style; however, the trunk emerges out of the soil on the left or right side of the root base, in a slanting manner, making an angle with the ground surface.
- **Cascade** (*kengai*): It is a style of growing trees that grow over water banks or down the sides of mountains. It is of two types, viz., Semi-cascade style, in which, the apex of the bonsai extend upto the lip of the bonsai pot and Full cascade style, in which the tip extends further and falls below the base of the pot.
- **Shari** (*sharimiki*): It is a style involving the portrayal of a tree in its struggle to live while a significant part of its trunk is bare of bark.
- **Root-over-rock** (*sekijoju*): It is a style in which the roots of the tree are wrapped around a rock, entering the soil at the base of the rock.
- **Growing-in-a-rock** (*ishizuke*): It is a style in which the roots of the tree are growing in soil contained within the cracks and holes of the rock.
- **Forest** (*yose ue*): It comprises of plantation of odd number of trees of one species in a bonsai pot.
- **Multi-trunk:** In it styles like *sokan* and *sankan* have all the trunks growing out of one spot with one root system, so the bonsai is actually a single tree.
- **Raft** ((*ikadabuki*): It is a style of bonsai that mimic a natural phenomenon which occurs when a tree topples onto its side, due to natural calamity.
- **Literati** (*bunjingi*): It is a style characterized by a generally bare trunk line, with branches reduced to a minimum, and foliage placed toward the top of a long, often contorted trunk.
- **Broom** (*hokidachi*): It is a style used for trees with fine branches. The trunk is straight and branches out in all directions about $^{1}/_{3}$ of the way up the entire height of bonsai. The branches and leaves form a ball-shaped crown.
- **Windswept** (*fukinagashi*): It is a style describing a tree that appears to be affected by strong winds blowing continuously from one direction, as might shape a tree atop a mountain ridge or on an exposed shoreline.[71]

Size classifications of bonsai: Japanese bonsai refer to the size of individual bonsai specimens by assigning them to size classes. It is as follows:

1. **Large bonsai:** Their size ranges between 30 to 80 inches. They are of 4 types viz., Imperial bonsai (eight handed – 60 to 80 inches), Hachi-uye (six handed – 40 to 60 inches), Dai (four handed – 30 to 48 inches) and Omono (four handed – 30 to 48 inches).
2. **Medium bonsai:** Their size ranges between 10 to 36 inches. They are of 3 types' viz., Chiu (two handed – 16 to 36 inches), Chumono (two handed – 16 to 36 inches) and Katade mochi (one handed – 16 to 36 inches).
3. **Miniature bonsai:** Their size ranges between 1 to 10 inches. They are of 5 types viz., Komono (one handed – 6 to 10 inches), Shohin (one handed – 5 to 8 inches), Mame (palm sized – 2 to 6 inches), Shito (fingertip sized – 2 to 4 inches) and Keshitsubo (Poppy fruit sized – 1 to 3 inches).

IMPORTANT GARDEN FEATURES

The garden shows different features in its plan, viz., paths and avenue, hedge & edge, lawn, flower beds, arches and pergolas, fencing, water bodies, rock garden etc. Depending on these locations, the plants to be cultivated in the particular location varies. Following are the important garden features and the plants suitable for each location:

1. **Paths:** Path connects different parts of the garden as well as main road. These are the skeleton frame work of a garden and a means of circulating around the place. The paths are 3 to 4 feet wide and can be made up of variety of materials like earth or soil, bricks, sand, stones, paving or even grasses. Sometimes, the main path in the garden is paved. The bricks are cemented and joined with each other to form the path. Such paths are used, where one has to create 'old establishment effect' is to be given. The places, where there is wear and tear, over there, the paths are hard and are made up of concrete, e.g., paths in green houses. Paths, which are necessary for proper working, are properly leveled. If there is any fall, the steps are laid down and a connection is established. The paths of gravel or stepping stones made through flower beds always give informal look.

   The plants grown on pathway or foot way are smaller than the avenue trees with beautiful coloured flowers or with evergreen foliage. They are as follows:

   - ***Butea frondosa*** (Family: Leguminaceae, Sub-family: Caesalpinae)**:** A medium sized deciduous tree with beautiful bright red flowers.
   - ***Azadirachta indica*** (Family: Meliaceae): A medium sized evergreen tree with medicinal properties. Commonly known as 'Neem' plant.
   - ***Cassia fistula*** (Family: Leguminosae, Sub-family: Caesalpinae)**:** The plant is commonly known as Indian laburnum, Golden showers/ Amaltas. It is medium sized, slow growing tree. Whole tree is enveloped in a mass of large, long pendulous racemes of bright yellow flowers which have delicate fragrance. Therefore, the tree is an imposing sight when flowering. The plant bears beautiful, long, cylindrical green pods which turn black at maturity.
   - ***Erythrina indica*** (Family: Leguminosae, Sub-family: Caesalpinae)**:** The plant is commonly known as Indian coral tree. It is medium sized tree with scarlet red flowers.
   - ***Gliricidia maculata*** (Family: Leguminosae, Sub-family: Caesalpinae): A small handsome tree with purplish pink flowers.
   - ***Millingtonia hortensis*** (Family: Bignoniaceae): It is commonly called Indian cork tree. The flowers are white and fragrant.

- ***Saraca indica*** (Family: Leguminosae): It is commonly called Seeta-Ashok tree. It is a beautiful evergreen plant with bunches of orange red flowers.

2. **Avenues:** An avenue is generally a long roadway, pathway or drive way to reach the house in big establishment or estates. The avenue plants give shade to the long pathway. Generally indigenous plants are selected for avenues. The plants are also referred to as road side plants. Some of the common road side plants are:
   - ***Adansonia digitata*** (Family: Bombacaceae)**:** It is one of the largest tree having bright crimson large flowers. Therefore, the tree is an imposing sight when flowering.
   - ***Callistemon lanceolatus*** (Family: Myrtaceae)**:** It is commonly known as bottle-brush plant because of the appearance of its inflorescence. It is small erect growing Australian tree with a neat growth. The leaves are small, stiff, narrow, pointed and aromatic. Bright crimson-scarlet flowers are borne in clusters on old branches.
   - ***Delonix regia*** (Family: Leguminaceae, Sub-family: Caesalpinae)**:** It is commonly known as 'Gulmohar' tree. It is a handsome tree with a large canopy hence, very valuable in gardens for shade and also forms a very fashionable avenue. It's feathery, deciduous, bipinnately compound leaves which fall off during summer leaving bright orange red flowers on branches and forms the point of attraction. The plant is quick growing, easily raised from seeds.
   - ***Polyalthia longifolia*** (Family: Annonaceae): It is a tall evergreen tree growing 10–15 m in height. It is commonly called false Ashoka or mast tree. It is an elegant, erect growing tree with shining lance shaped, bright green, polished leaves and wavy branches. The tree is suitable for dry regions, need very little attention and grow in any kind of soil. If planted closed to each other, the trees form a high screen.
   - ***Casuarina equisetifolia*** (Family: Casurinaceae): It is a tall, elegant, evergreen tree and appears like *Pinus*. The foliage consists of needle like leaves. It is often planted to control the soil erosion and afforesting sandy beaches.
   - ***Ficus bengalensis, Ficus religiosa*** (Family: Urticaceae): These are large, road side plants, especially planted for giving cool shade.
   - ***Acacia auriculiformis*** (Family: Leguminosae, sub-family: Mimosae)**:** It is resilient, vigorously growing, medium sized tree. It can grow in all types of soil including the poor soil. The plant shows compound leaves which fall at early stage and leaf petiole gets modified to give leaf like appearance, which is called phyllode. Flowers are yellow, profusely produced in a spike. It is popular for shading factory, college, school grounds, parks, play-grounds etc.

3. **Hedges:** Hedges are the important adjuncts to every garden. It is necessary to demarcate the garden from public road and adjacent gardens or bungalows. It ensures privacy and it shelters from strong winds. It is not only effective in protecting the garden from trespassing cattle and thieves but also affords a pleasing sight when fresh with foliage or when in blooms. Besides its utility as screens, hedges are necessary to provide backgrounds to the children section in the garden.

   Long hedges are always associated with farms and large gardens. They are attractive as well as impenetrable. For a quick hedge, bushes are grown in two rows separated 12 inches apart within a row and 8 inches apart between two rows. Majority of these plants are propagated by cuttings. The big farms are often hedged with big and thorny bushes or spiny cacti like *Opuntia*, *Euphorbia* etc. For ornamental hedges, fast growing colourful plants can be selected. Many of these ornamental hedges can be cut into various shapes, e.g., human figures, animal shapes, geometric figures etc. This art is called topiary. Topiary is a skillful work and is practiced only in few traditional, reputed gardens. The ornamental hedge plants used in topiary have small foliage and are slow growing.

Their stems can be easily bent and held in positions by tying them on a iron skeleton with wires. Thus the plants cover the entire skeleton and exhibit the particular shape.

The hedge plants used for bordering or screening are quick growing hardy shrub or climber, drought resistant and they stand trimming to shape and do not attract snakes and snails. The hedge plants can be pruned twice a year.

Different plants are used for hedges depending on its position in the garden. They are as follows:

- ***Justicia gendarusa*** (Acanthaceae)**:** It is a medium sized, quickly growing bushy plant which can be propagated by cuttings. Leaves are large, opposite, decussate. Flowers are white and insignificant. It is a hardy plant, which stand heavy rainfall and thrives in shade.
- ***Hamelia patens*** (Rubiaceae)**:** The plant is slow growing elegant plant. It forms an attractive hedge with ever greenish brown foliage of small leaves. Flowers are red coloured and are produced in helicoids cymes.
- ***Duranta plumieri*** (Family: Verbenaceae)**:** Plants are tall, thorny, woody, evergreen shrubs with opposite leaves. Inflorescence is axillary or terminal raceme forming a panicle. The plants produce handsome white or blue flowers with purplish tinge followed by charming yellow berries. It makes a firm hedge, thriving in almost any kind of soil, can easily be propagated from seeds or cutting and can withstand severe trimming.
- ***Clerodendron inerme*** (Family: Verbenaceae): Plants are of medium height, thorny, woody, evergreen shrubs. Leaves are polished green, simple, small, opposite, elliptic in shape and with disagreeable smelling when bruised and hence, this hedge does not harbor reptiles. Flowers are white, in 3– flowered cyme. The plant takes about two years to form a good hedge and can withstand long duration without water. It is often trimmed to maintain the desired height. It is well adapted to topiary which is the art of cutting the plants to make various shapes of animals, birds, human-beings etc.

4. **Edges:** Edges are small heighted border demarking the one garden feature from another. Generally, edges are used to border the flower bed, pathway, lawn, pond etc. The edges can be prepared from living material such as flowering or foliage plants or by using non living materials like bricks, concrete blocks, wooden planks etc. In gardens, the paths are often separated by placing bricks diagonally in half buried manner. Following are some of the important plants used for edge preparations**:**
   - ***Coleus blumei*** (Family: Labiatae): It is a perennial herbaceous plant attaining a height of 30 cm to 50 cm**.** The plant bears coloured foliage consisting of purplish pink to green leaves with serrate margin. Small purplish white flowers are produced in verticillaster type of inflorescence. The plant forms beautiful coloured edges.
   - ***Catharanthus roseus*** (Family: Apocynaceae): The plant is commonly known as Sadaphuli or Periwinkle. It is a bushy plant growing to the height of 30 cm to 60cm. It shows bright green, smooth, oblong leaves and rosy purple flowers. The plant blooms all round the year hence the name Sadaphuli.
   - ***Pilea microphylla*** (Family: Urticaceae): The plant is used for edging gardens and rockeries. They are suitable for semi shade and shade, but can be grown in open and cool climates. Many flowering annuals and perennials are used for edging.

5. **Flower bed:** The role of a flower bed is to display the flowers in the best possible way. Flowers look best when massed in a bed and hence are of special importance in landscaping.
   - ***Rosa sinensis*** (Family: Rosaceae)**:** The plant is small shrub having green hard stem with prickles. Leaves are imparipinnately compound with adnate stipules. Each leaflet shows ovate lamina, serrate margin and acute apex. It produces beautiful scented flowers which are available

in different colours like pink, red, orange, yellow, cream etc. therefore it is a famous flower bed plant.

- ***Pentas carnea*** (Family: Rubiaceae)**:** It is a small hairy herb with four angled stem. Leaves are opposite, oblong, lanceolate with interpetiolar stipules and grooved veins which are acute above and prominent below. Flowers are violet, pink or scarlet red in large terminal corymbs. It is cultivated in gardens for flower bed preparations as it beautiful flowers in constant succession.
- ***Petunia violacea*** (Family: Solanaceae): It is a small annual herbaceous plant. Leaves are alternate throughout or opposite in top region, ovate and acute. Flowers are (Mar. to Jun.) solitary; funnel shaped, purple, white or pink coloured. It is cultivated in gardens in flower bed preparation.
- ***Chrysanthemum indicum*** (Family: Asteraceae): It is commonly called 'Shevanti. It is a small perennial plant. Leaves alternate, pinnatipartite, hairy. Flowers are solitary or are in clusters on long peduncles with white, yellow, red – pink or variegated beautiful colours. When in bloom, present one of the grandest floral sights. It can be propagated by suckers from the old plants, by cuttings or from seeds. The plants required a liberal supply of water. Half open buds should be protected from severe afternoon sun.
- ***Antirrhinum majus*** (Family: Scrophulariaceae): It is a small annual herb, a great favourite, very serviceable as a bedding plant. Leaves are opposite, ovate to lanceolate with acute apex. Flowers are in terminal raceme and gorgeously coloured as yellow, pink, white, blue, scarlet etc. The plant is easy to grow, thriving in light soil, well endowed with lime. Prefers some amount of dryness at the roots hence, preferably grown after rains. To keep the plant for flowering for the second time, fading flower spikes should be cut back scrupulously.

6. **Arches and pergolas: Arch** is one of the important garden features. It is an arc which is supported by pillars and covered totally by clipping and training the climbing plants to form canopy. Arches vary in their sizes, shapes and designs. Many times, arches are found near the entrance of the garden or at the entrance of any section of the garden, e.g., children playing section, seating-section. **Pergola** is a garden feature. It is actually a series of rustic arches covered with climbers to form canopy. It forms a shaded walk or passageway of pillars that support cross beams and a sturdy open lattice, upon which woody vines are trained.

   Pergolas should be erected in such a place in the garden that their design and existence homogenize with entire planning of the garden. Pergolas may link pavilions or may extend from a building's door to an open garden feature such as an isolated terrace or pool. Sometimes, it may be entirely free-standing structures providing shelter and shade to a length of walkway.

   Pergolas may be simple or double. The materials used to prepare the skeleton or frame of pergola include iron, bamboos, timber or even bricks and stones. Generally climber, twiners or lianas are used to cover these skeletons or frames. When creepers are used, they are tied to the frame so that they can grow easily by taking the support. In such plant support is very essentially as they can not grow vertically on their own. Most of the climbers used for arches and pergola making require strong sunlight for their growth and flowering while a few can grow well in shade.

   The plants used in arches and pergola making are as follows:

   - ***Ipomoea palmata*** (Family: Convolvulaceae): It is a perennial climber. The plant bears palmately compound leaves and large, showy lavender coloured flowers. The plant is used as an ornamental climber for arches, pergolas and walls.
   - ***Clitoria ternatia*** (Family: Fabaceae): It is a perennial herbaceous plant. Leaves are elliptic and obtuse. It grows as a creeper. The most striking feature about this plant is the vivid deep blue flowers; therefore, it is grown as an ornamental plant. The flowers are solitary, with light yellow markings at the base. The plant thrives well in moist neutral soil. The roots of the plant fix

nitrogen and therefore this plant is also used to improve soil quality.

- ***Quisqualis indica*** (Family: Combretaceae): It is known as Rangoon Creeper. The plant is a creeper with pinkish-red flower in clusters. It cultivated as an ornamental climber. The leaves are opposite, elliptical with an acuminate tip and a rounded base. The flowers are fragrant and tubular and their color varies from white to pink to red
- ***Antigonon leptopus*** (Family: Polygonaceae): It is commonly known as Coral Vine. The plant is a vigorous perennial climber. It is known for its dense green foliage and small delicate lantern shaped flower in long trailing lovely sprays. The flowers are white or in attractive shades of red and pink and are produced in drooping clusters. The creepers grow well over arches, pergolas and walls. The plant withstand pruning greatly.
- ***Bougainvillea*** (Family: Nyctaginaceae): The plant is a woody climber. It has long arching branches bearing thorns, heart-shaped leaves and masses of papery bracts in white, pink, red, magenta, orange, yellow, purple and burgundy bracts containing flowers. The thorns are tipped with a black, waxy substance. The leaves are alternate, simple ovate-acuminate. The actual flower of the plant is small and generally white, but each cluster of three flowers is surrounded by three or six bright coloured bracts. It is a popular ornamental plant in most areas with warm climates. In the landscape, it makes an excellent hot season plant and its drought tolerance makes it ideal for warm climates year-round.
- ***Thumbergia alata:*** (Family: Acanthaceae). It is commonly called Black-eyed Susan vine. It is a herbaceous perennial climber. It is grown as an ornamental plant in gardens over arches and pergolas. It has twinning stems with heart or arrow-shaped leaves. It favours sun to partial shade. The flowers are typically warm orange but can range from red, orange, to bright yellow with the characteristic chocolate-purple centre which inspires the common name.

7. Rock garden:

A rock garden, also known as a rockery or an alpine garden, is a type of garden that features extensive use of rocks or stones, along with plants native to rocky or alpine environments.

The usual form of a rock garden is a pile of rocks which are large and small and are arranged aesthetically by leaving small gaps between them. In these gaps, the plants will be rooted. Some rock gardens are designed and built to look like natural outcrops of bedrock. Stones are aligned to suggest a bedding plane and plants are often used to conceal the joints between the stones. Rock garden plants are small. They may be grown in troughs or in containers or in the ground. These plants prefer well-drained soil and less water. Some rock gardens incorporate bonsai. The common rock garden plants are as follows:

- ***Agave americna*** (Family: Liliaceae): It is a large perennial herb. Leaves are radical, long, broad, fleshy and prickly at margins and forms attractive massive rosette. It flowers only once in its lifetime. Flowers are beautiful, funnel shaped and are produced in long attractive scape with large bracts. It is planted as hedge plant in rock garden. In flowering state, the plant forms the best focal point in the rock garden.
- ***Euphorbia milli*** (Family: Euphorbiaceae): A small armed shrub. Stem is fleshy and shows presence of milky latex. Leaves are alternate, oblong, acute, obovate and with mucronate apex. Stipules are modified into sharp, long spines. The plant produces beautiful red coloured small sized flowers. The plant is one of the common plants in rock garden.
- ***Euphorbia tirucalli*** (Family: Euphorbiaceae): A small, unarmed, much-branched plant. The branches are cylindrical, thin, smooth, and green. Leaves are small, linear, oblong and deciduous. It forms a best hedge plant in rock garden.
- ***Euphorbia antiquorum*** (Family: Euphorbiaceae): It is a much branched, fleshy green shrub having modified stem with three wings. Leaves are small, obovate, fleshy and deciduous with

short, sharp stipular spines. The plant exhibits all the xerophytic characters hence form best plant for rock garden.

- ***Aloe vera*** (Family: Liliaceae): It is a small herb with stolons. Leaves are radical, fleshy with broad base and narrow apex. The leaves are pale green and have horny prickles on the margins. Flowers are small, beautiful and are produced in long attractive scapes. The plant exhibits all the xerophytic characters hence form best plant for rock garden. In flowering state, the plant forms the best focal point in the rock garden.

LAWN

Lawn is the basic feature of garden which consists of grass, grown as green carpet in a landscape.

Purpose of preparation of lawn: Well maintained manicured green lawn is a pride and charm of the garden. It gives lush green effect to the ground and enhances the beauty of the landscape. It avoids soil erosion. It not only accelerates the beauty of the garden but also gives relaxation to feet and mind.

Method or Procedure for preparation of Lawn: The lawn making involves following steps:

a. Selection of site and its preparation: The position of lawn is largely dependent on the layout of the garden in relation to house or main building or other parts of the garden or landscape. The site for a lawn should be solitary, wide and open with direct access to sunlight. There should not be too much of a shade or too much of large sized plant. If present, the plants should be trimmed nicely and groomed.

After choosing the proper site, the next important function is preparation of site. The preparation of site includes digging, leveling, enriching the soil with organic manures and fertilizers. During digging, weeds, stones, litter, old foundations are removed completely. The site should be thoroughly worked with spade. All the soil clods should be smashed finely. If the area is large, frequent ploughing is essential to remove the deeply rooted weeds. After this, the soil is turned and mixed with compost or other similar manure. The weed-free, well manured soil is perfectly leveled and watered thoroughly. If the area is small, the top soil is rolled with roller and pressed with heavy flat iron plate connected to a straight pole.

The ideal soil for lawn consists of fertile loamy soil with enough humus content and pH between 5.5 and 6.0. The soil should retain required amount of moisture but at the same time adequate drainage is also essential.

b. Drainage: If the lawn is of small size, the slight slope on one side ensures natural drainage, in case of heavy showers during monsoon. If the lawn is of large size and becomes water-lodged quickly, then in such cases, protective drainage is desirable which consists of a line of clay pipes of suitable diameters and lengths, laid underground, with sufficient discharge, opening at low level to drain out the water during monsoons.

c. Raising the lawn: The raising of the lawn may be undertaken any time during hot season, provided good irrigation is available. Once the site is ready with all the necessary amendments, lawn can be raised by following methods:

i. Lawn raising by seeds: Raising the lawn from seeds is quite rare method. Though, it is even, neat and cheaper, it requires more attention in early stages of growth. The site should be divided into suitable small squares. The soil is loosened and the computed amount of seeds per unit area is sown. The usual seed rate is 0.5 to 1.0 kg seeds per 100 square meters. The seeds are mixed with double quantity of fine soil and should be broadcasted by hands or machines evenly on a windless day. If possible, sowing is done before full moon as it gives better germination and stronger growth. Sowing can be done in two batches. In the first batch, sowing is done

lengthwise from one point to other. And in second batch, the sowing is done by crossing from the other two sides. After sowing, a rake is drawn lightly twice in both the directions to ensure uniform mixing of the soil. The plot is watered at regular intervals using a fine spray. Care should be taken not to over flood the site; otherwise, the seeds may float and be drifted away. Germination will take place within 2 to 4 weeks after sowing, under normal conditions; however, in cooler regions it may take up to five weeks.

ii. **Lawn raising from chopping:** Besides raising the lawn from seeds, the grass choppings can also be used. The lawn grass like *Cynodon dactylon* (Doob grass) can be procured in large quantities and chopped finely to get the bits of 5 to 7 cm size with their root-stock. Two baskets of chopped grass, garden soil cow-dung and wood-ash are added in the proportion of 2:1:1:1 and are mixed thoroughly with water to form a thick paste. This mixture is then spread uniformly on the leveled ground to a thickness of 2.5cm. Watering should be done gently with water-cans. Next day, ground should be rolled and pressed properly and the grass should to be allowed to spread in all the directions.

iii. **Lawn raising by dibbling roots:** Dibbling is done by making small holes in wet ground. Holes should be 15 to 20cm deep. Roots of grass are planted in these holes. It takes about 5 to 6 months for spreading of these roots and for formation of a good compact lawn.

iv. **Lawn raising by turfing:** Turf is actually a piece of earth with compact grass on it. Turfs of suitable sizes are prepared and are transplanted to the soil. The turf pieces are firmly fixed on ground. Watering is done heavily till the grass of the turf gets adjusted to the new surroundings.

v. **Lawn raising from Astroturf:** Astroturf is a synthetic turf which is easy to maintain, hence popularly used for lawn making. Grass is a perennial herbaceous plant and keeping it alive through the dry hot summer is a challenging task. Due to high cost of labor and scarcity of water, maintenance of lawn is very expensive, therefore in such cases 'Astroturf' becomes the best option. Unlike grass, Astroturf does not absorb heat but transmit the heat hence Astroturf requires sprinkling of water to bind the synthetic fibres of the Astroturf with each other to provide surface similar to the carpet.

d. Management (After-care) of lawn: Raising lawn may be done by any method but frequent mowing, rolling and proper watering gives pleasant appearance to lawn. If it is not rainy season, watering is done every ten days heavily. Weeds are removed periodically and the place created should be filled with grass roots and soil. After every month it is necessary to manure the lawn. Use of proper weedicide and spraying with Bordeaux mixture as a general fungicide give good control over weeds and diseases.

Management/Maintenance of lawn: Management or maintenance of lawn is laborious and skillful work. It involves following steps:

i. **Mowing:** Lawn grass should neither be allowed to grow taller nor to flower as it gives a neglected appearance. When lawn comes to a height of 5 to 10cm, first cut is given. For this purpose, instead of using lawn mowers, shears can be used. Before using, lawn mower for the first time, light rolling and pressing of the lawn is done. A well maintained lawn shows long rows of dark and light shading as a result of running the mower in opposite directions at an interval of 10 to 12 days. The edge of the lawn should be periodically trimmed.

ii. **Top-dressing:** fertilizing the lawn, trice a year is adequate to maintain the rich greenness and to keep the soil enriched. Application of nitrogenous fertilizers, especially, Urea and Ammonium sulphate at the rate of 0.5 and 1 kg per 50 square meters respectively during February–March, June-July and October-November is beneficial. Bone-meal at the rate of 1 kg per 10 square meter area will give good results. At times, well decomposed compost, at the rate of 10 kg per 10 square meter area will be sufficient for top-dressing.

iii. **Weeding:** occasional hand-weeding is essential to maintain a good lawn. The dicotyledonous weeds like *Euphorbia thymifolia* (red creeping weed) can be easily recognized and pulled out in early stages. *Cyperus rotundus* (Nut grass weed) is another harmful weed which should be removed periodically along with its nut and root system.

iv. **Pest and disease management:** Organic or synthetic pesticide application is necessary to keep the pest and disease under control. Spraying with Bordeaux mixture as a general fungicide give good control.

Lawn Plants

Lawn plants consist of two types viz., lawn grasses and lawn trees. Their brief account is given below:

Lawn grasses: For the production of excellent lawn, the grass should be of fine quality, fast growing with narrow, evergreen foliage. These qualities enable the grass to thrive well in poor soil to withstand repeated mowing and frequent fertilizer application. In recent years, seeds of most promising selections as well as fine lawn hybrid grasses are available. The notable ones among them are *Stenotaphrum secundatum* (Augustine grass), *Festuca rubra* (Fescus grass), *Agrostis tenuis* (Brown tip grass), *Poa pratensis* (Kentucky blue grass), Cyanodon dactylon (Doob grass/ Kweek grass), *Paspalam* species (Ribbon grass), *Zoysia japonica* (Japanese coarse grass) Kenya grass, Calcutta grass, Korean grass, Hybrid burmuda grass etc. In shady places, small yellow flowered *Oxalis* sp. is cultivated for lawn making. Sometimes, small creeping plant called, *Lippia nodiflora* makes an excellent lawn and does not require as much water as the other grasses require. Due to good spreading habit and compact growth, the dicotyledonous weed, *Dichondra repens* is also popularly used for lawn making.

Lawn trees: Besides lawn grass, lawn shrubs or trees are other important members of lawn, which enhance the beauty of the lawn. Many times the lawns are enriched by beds of flowering plants like *Canna*, Bright *Acalypha*, Crotons, *Ixora* etc. Large tree like *Araucaria*, T*h*uja, Pin*u*s, *Casuarina*, *Callistemon*, *Polyalthia* etc. make either ornamental boader around the lawn or form an attractive focal point on the lawn.

MUGHAL GARDENS

Mughal gardens are a group of gardens built by the Mughals in the Islamic style of architecture. This style was influenced by Persian (Irani) gardens.

History

Inhabitants of Iran and Central Asia had love for plants and flowers. The founder of the Mughal Empire, Babur, described a garden known as Charbagh. The Agra garden, now known as the Ram Bagh, is thought to have been the first charbagh. Early textual references about Mughal gardens are found in the memoirs and biographies of the Mughal emperors, including those of Babur, Humayun and Akbar. India, Bangladesh and Pakistan has a number of Mughal gardens which differ from their Central Asian predecessors with respect to "the highly disciplined geometry". Some examples of Mughal gardens are Shalimar Gardens (Lahore), Lalbagh Fort at Dhaka, and Shalimar Gardens (Jammu and Kashmir). Akbar's heir, Jahangir, helped to lay out the famous Shalimar garden and was known for his great love for flowers. Indeed, his trips to Kashmir are believed to have begun a fashion for naturalistic and abundant floral design. Jahangir's son, Shah Jahan, marks the apex of Mughal garden architecture and floral design. He is famous for the construction of the Taj Mahal, a sprawling funereal paradise in memory of his favorite wife, Mumtaz.

Types of Mughal gardens

These gardens can be grouped into two main types or groups which are as follows:

- **Pleasure gardens:** These were meant for the pleasure of king and queen and their family members.

- **Tomb garden:** These are the gardens attached to the tombs of queens and kings for giving peace to them after their death.

Main Features of Mughal garden

The roots of Mughal garden designs lie in Persia (Iran). Persians are credited with introducing the formal four part walled garden known as 'Charbagh'. In Charbagh pattern, the simple plot is divided into four equal plots by providing water canals in the centre. These canals are raised above the ground and are used for irrigating the trees and flowering plants. Main features of mughal garden are as follows:

1. **Site and style of design:** Mughals have always preferred river banks or hill slops with a water stream, to construct the gardens. The garden design is formal, symmetrical and usually rectangular or squarish in layout.
2. **Walls and gates (entrance):** Mughal gardens were not only meant for pleasure and recreation but also for the forts and residence. Due to presence of such forts and residences, the mughal gardens are surrounded by high walls with an imposing huge strong wooden gate at the entrance. This gate is studded with bold iron nails and pointed iron spikes. The high walls were meant for security purposes and also for shelter against hot winds.
3. **Terrace:** Mughal had come from hilly terranians; therefore they have fond of including terraces in their garden designs. According to Islamic faith, the paradise has 8 dimensions and hence some gardens have 8 terraces corresponding to 8 dimensions. Sometime, there are 7 terraces representing the 7 planets or 12 terraces representing the zodiac signs. Generally, the entrance is situated at the lowermost terrace level except at Pinjore garden, where it is at the topmost terrace level.
4. **Running water:** This feature is borrowed fro Persian style. The fascination of water comes from muslim faith which says that, the paradise is the place where, 'cooling water flows'. Broad water canals are made in overall proportion of garden with a strong central axis in the form of a fountain. Running water is represented in the form of cascades and chadars. The raised level of central tank gives rise to the concept of chadar or water sheets. The common types of chadars are Silent chadar, Ripple chadar, patterned chadar, Marble chadar, Marble cascade etc. Many times, the water canals are paved with tiles or marbles of blue colour to create the illusion of depth and small lamps are illuminated to create the beautiful reflection. Besides providing coolness and freshness to the gardens, the water canals reflect the blue sky, stars, moon, trees etc. this is the unique attraction to the visitors.
5. **Baradari:** It is a structure made up of stone or masonry with a roof and a raved platform for sitting. *Diwan E Am* and *Diwan E Khas* are the famous types of biradari. These were provided with 12 or more doors on all its sides for the emperors and their family members to watch the dance performances.
6. **Tomb or mosque:** It is a common practice to have a garden built around a tomb, e.g. Taj Mahel.
7. **Trees and flowers:** Mughals had always preferred flowers, spring flowering trees and seasonal flower beds of geometrical patterns. These were used to be constructed along the water canals or near the main buildings. Mughal empires selected the plants carefully, keeping in mind the local climate. Mostly, they planted fruit trees, shrubs, colourful annuals like carnations, delphinium, hollyhock etc., fragrant flowers like rose, jasmine, champa etc.
   In Kashmir mughal gardens, they planted Chinar, White popolus, Cypress, Apple, Peach, Palm,cherries, pomegranate, fig etc. In plains, these mughal gardens incorporated mango, grape, fig, orange, peach, plum, pals, Chandan, Champa, roses, Hibiscus, Jasmine, sunflowers, carnations, cocks comb etc. in their settings.

Symbolism in Mughal gardens

In garden design, Mughal gardens incorporated strong symbolic elements which were common to all Islamic gardens. Most of all the mughal gardens symbolised the Gardens of Paradise referred to in the Koran. For mughals, each tree symbolized something like life, youth, death etc. Water is considered as a source of life. Fruit trees were considered symbol of life and youth. Cypress and flowering plants along the water canals represented immortality. White Kachnar (*Bauhinia alba*) represented the concept of youth and renewal of life. The numbers seven, eight, nine and twelve were considered auspicious by the Mughals. These can be found in the number of terraces or as a part of garden architecture such as octagonal pools. The cross formed in the centre of the water canal represents union of humanity with god.

BUDDHIST GARDEN

Buddhist meditation is a method for cultivating this peaceful, harmonious way of being. Buddha himself reached Enlightenment while sitting under a Bodhi tree in a forest. He gave his first teachings to other people in a deer park. When near to death, he chose to spend his last hours in a garden under flowering trees. The gardens are used in Buddhism as uplifting environments which can put people in tune with Buddhist religious feeling in much the same way that a beautiful temple or Buddha image can do. Buddhist gardens are the natural places for people to go to study or think about Buddhism. Sometimes Buddhists use them as places for meditation.

Layout

Buddhist gardening is the gardening from the higher perspective. All monastic gardens are an expression of the innate wisdom of the community and visitors. Gardening is the personification of Buddhism in action. The Sangha is represented in the community of plants. The Dhamma as the expression of wisdom is the collective environment represented by the garden. The Soil represents the fertile ground of the Buddha Mind. Paths represent the clear ways to enlightenment. The condition of the soil represents the state of our Karma. The plantings represent both fruitful and blossoming ideas, perennial and dying concepts. Seasons represent the fluctuations of the mind. Peace and serenity are always associated with gardening. Mindful weeding is attention with purpose and will help us clear the overgrown patches.

The eight fold path of Buddhist Gardening is as follows:

1. Gardening is the intention to improve. The gardening is a service to the community and ultimately to themselves who need to meditate on the nature of walls, obstacles, hedging etc.
2. In gardening the internal mind dialogue is replaced by the external Buddha in Nature. Gardening is the way of communication with nature.
3. Gardening is activity. The more active we are in gardening - the quieter our minds become.
4. Gardening is an expression of both Sansar and nirvana. In its interplay, the whole realms of experience exist.
5. Gardening tasks that seem less enjoyable become easier until all aspects of gardening are seen in a non differential way.
6. Unattended garden give ugly look. Likewise a distracted mind is destructive to the individual.
7. Focusing on a gardening job is one of the best mind practices. Similarly by focusing on our task and breath, we become more efficient in all areas of our life.
8. Weeding helps to keep the garden clean and healthy. Likewise it is always important to sweep away extraneous thoughts which are harmful to our mind.

Based on above philosophy, there are following eight features, of which at least 2 to 3 must be included in the setting of Buddhist gardens:

1. Inspiring places to sit and walk
2. Buddhist pictures and texts placed along the paths
3. Statues of Buddha and lotus pools
4. Things which prompt one to make good wishes

5. Giving food to birds, fish or animals
6. Taking trouble not to kill other creatures
7. Sharing the garden with other creatures
8. Gifts in the form of service, fund or volunteer-ship make up the garden

Thus, the Buddhist garden promotes peacefulness, goodwill and respect for all creatures.

VERTICAL WALL GARDEN

Vertical wall garden is a green living wall, which is partially of completely covered with plants. Instead of using horizontal ground surface, in these gardens, vertical space is utilized. These gardens can be standing freely or as a part of any building. These gardens have revolutionized the landscape and green building industries.

Types:

i. **Green facade:** In this type, climbing plants are grown on a wall where the plants attach themselves directly to the surface or are grown on supporting structure. These climbers are grown in ground soil or pot soil present at the base of the wall.
ii. **Living wall:** In this type, plants are grown vertically in a structure attached to a wall surface but held little away from it. Many times, they are separated from walls by waterproof membrane. These walls are highly efficient, practical to use and give best results.

Construction:

For the construction of vertical wall garden, light weight panels are used which are very easy to install. These panels can be mounted on walls directly with the help of mounting strips. Many times, these panels have inbuilt irrigation systems. Such systems reduce the maintenance and make the panel more user-friendly. For smaller installations, there are drip and collection trays. For larger installations, automatic irrigation systems can be used.

Now days, unique modular living wall systems are also made available in the market. These systems exhibit following properties:

- These can be installed on any surface including slopes.
- Their thickness is just 3" and can be mounted directly on walls.
- The panels are 50 x 50 cm^2 in size and are made up of 100% recyclable materials.
- Each panel has many small cells with a small water reservoir.
- Water can not escape from any side as all sides and joints are tightly sealed.
- Each cell or compartment is provided with a small ridge at the back side to allow airflow and to prevent loss due to moisture problems caused due to rain water in case of outdoor walls.
- Many times these panels are provided with soil or specially prepared growing medium which contains different organic and inorganic components essential for plant growth.
- These panels are available in two forms viz., Pre-grown panels and Panels for plantations.

Significance:

- In tropical countries like India, these gardens are acting as insulators and coolers.
- These gardens absorb heat; improve the air quality and help to reduce urban island effect.
- It is useful in urban areas with space crunch as they allow good utilization of vertical space.
- The vertical wall gardens are also suitable in arid areas because the circulated water on vertical walls is less likely to get evaporated than that on horizontal grounds.
- These gardens add to the beauty of the nature without disturbing the natural harmony.
- It is used indoor or outdoor as a barrier or screen.
- These walls also act as sound barriers.
- Since fresh vegetables can also be grown in these panels, these forms of gardens are the best option for kitchen gardens.

THEME PARKS

Theme park is a park having its lands devoted to telling a particular story or theme. It is one of the recent concepts in landscape gardening. In this type, one particular idea or concept is considered and landscaping is done based on the concept. These lands are characterized by the idea that the immersive environment they create contains architecture, landscaping, stores, rides and even food that support a specific theme.

A brief account of famous theme parks is given below:

- **Rock garden, Chandigarh:** A well known example of theme park in India is a rock garden of Chandigarh. The park contains variety of statutes of human-beings, animals, geometrical shapes etc. made up of rocks. In Noongnuch village, a theme park at Bangkok, rock garden is created in which statutes of not only human-beings and animals but also colourful birds like kingfisher, parrots, love-birds etc. are displayed.
- **Rose garden, Chandigarh:** It is another famous garden of Chandigarh. In it, colourful rose beds are maintained. Each bed is labeled by the name of the rose variety, cultivated in it.
- **Oorja bag, Pune:** Energy Park or Oorja baug of Pune is designed on the concept of energy conservation.
- **Nalla Park, Pune:** In this concept, park is cultivated using the recycled waste water. Mahim Nature Park, Mumbai is the best example of Nalla Park which is raised on the dumping ground. It pactises organic farming and has well maintained nursery for display and sale of the plants.
- **Eco-landscaping, Pune:** NGO's of Pune such as Kalpavriksha, Pune Tree Watch, Ikos have come up with the idea of Eco landscaping. As per this concept, landscaping is carried out in natural styles so that the final landscape will have close resemblance with the nature. Eco-landscaping also has a theme of maintaining small wet lands by creating artificial ponds. A suitable shrub and herb plantation is taken in the initial period of its establishment. The roots systems of these plants in wet areas may act as natural filters controlling water as well as soil pollution.
- **Butterfly garden:** Development of Butterfly garden is new concept. In it, garden is created by cultivating different flowering plants which are useful for butterflies for their feeding and nesting. Such plants help to attract butterflies and thus, garden becomes complete.
- **Bird parks:** Similar to butterfly garden, Bird parks are also in fashion. These are the landscapes which developed specially for various types of birds. This includes local avifauna as well as migratory birds. The plantations and maintenance of well mature shelter trees or wild fruit trees attract the birds. Jurong Bird park, Singapore is one of the famous bird parks of the world.
- **Medicinal gardens:** It is a simple type of garden, which includes cultivation of medicinal plants. In such garden, different plots are prepared. In this plots different medicinal plants are cultivated and a board explaining the medicinal importance of the plant is also incorporated.
- **Cactus garden:** It is a type of garden, which includes cultivation of different types of cacti.
- **Bonsai garden:** It is a type of garden, which maintains of different types and styles of Bonsais. Singapore Botanical Garden also maintains one section of Bonsai garden.
- **Orchid garden:** It is a type of garden, which includes cultivation and maintenance of different types of orchids. Singapore Botanical Garden also maintains one section of orchid garden.
- **Nutrition garden:** It is a new concept. The country is facing the problem of malnutrition and vitamin deficiency. To battle this problem, some of the NGO's from Mumbai have come up with this idea. In this garden the vegetables and fruits e.g., Papaya, Mango, Banana, Chikoo, Amla, Guava, Leafy vegetables, Carrot, Radish, Cabbage, Cauliflower etc. which can stop malnutrition and vitamin deficiencies are cultivated.
- **Astral garden (Nakshatra Udyan):** It is the famous concept which is practiced in various public gardens and nature parks. The theme of astral garden is strongly related to Indian culture.

According to Indian mythological belief, each and every individual has his own astral tree. The astral tree is decided by the constellation in which moon remains at the time of child birth. There are 27 constellations and each has a tree of its own. It is believed that when such astral trees are cultivated in the vicinity, the person gets positive vibrations and atmosphere. Tranquility, mental peace and relaxation are the positive aspects of nakshatra plants. Besides, all these trees release comparatively more amount of oxygen in the air. Following table gives the idea of constellations and their plants.

No.	**Nakshtra**	**Plant**	**Family**
1	Ashwini	*Strychnus nux-vomica* *Adhatoda vasaca*	Loganiaceae Acanthaceae
2	Bharni	*Emblica officinalis*	Euphorbiaceae
3	Kruttika	*Ficus recemosa*	Urticaceae
4	Rohini	*Eugenia jambolana*	Myrtaceae
5	Mriga	*Acacia catyechu*	Mimosa
6	Ardra	*Terminalia bellerica* *Santalum album*	Combretaceae Santalaceae
7	Punurvasu	*Bambusa arundinacea*	Poaceae
8	Pushya	*Ficus religiosa*	Urticaceae
9	Ashlesha	*Mesua ferea*	Guttiferae
10	Magha	*Ficus benghalensis*	Urticaceae
11	Purva	*Butea frondosa*	Fabaceae
12	Uttra	*Ficus lacor*	Urticaceae
13	Hasta	*Jasminum grandiflorum* *Sapindus trifoliatus*	Oleaceae Anacardiaceae
14	Chitra	*Aegel marmelos*	Rutaceae
15	Swati	*Terminalia arjuna*	Combretaceae
16	Vishaka	*Mesua ferea* *Nyctanthus artobotrytis*	Guttiferae Oleaceae
17	Anuradha	*Mesua ferea* *Mimusops elengi*	Guttiferae Sapotaceae
18	Jyeshtha	*Salmalia malabaricum*	Malvaceae
19	Mula	*Wateria indica* *Shorea robusta* *Acacia arabica*	Dipterocarpaceae Dipterocarpaceae Mimosa
20	Purvashadha	*Calamus roan* *Saraca indica*	Palmae Caesalpinnae
21	Uttarashadha	*Artocarpus heterophyllum*	Urticaceae
22	Shravan	*Calotropis procera*	Asclepiadaceae
23	Dhanishtha	*Prosopis spicegera*	Mimosa
24	Shatatarka	*Anthocephalus kadamba*	Rubiaceae
25	Purvabhadrapada	*Mangifera indica*	Anacardiaceae
26	Uttarabadrapada	*Azadirachta indica*	Meliaceae
27	Revati	*Madhuca latifolia*	Sapotaceae