

Practical Manual
on
Principles of Landscape Architecture
HFL-121 2(1+1)

(For Undergraduate Horticulture students)

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**RANI LAKSHMI BAI CENTRAL AGRICULTURAL
UNIVERSITY, Jhansi-284003**

Principles of Landscape Architecture HFL-121 2(1+1)

Syllabus: Study of garden equipments. Study of Graphic language, Use of drawing equipments, graphic symbols and notations in landscaping designing, Study and designing of different styles of gardens, Study and designing of gardens based on different themes, Designing gardens using Auto-cad/ archi-cad, Designing gardens for home, traffic islands, schools and colleges, public buildings, factories, railway stations, air ports, temples, churches, play grounds, corporate buildings/ malls. Designing and planting of avenues for state and National highways, Design and establishment of Japanese, English and Mughal gardens. Visit to public, institutional and botanical gardens.

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Practical No. 1

Objective: To study garden equipment

Exercise: Identify different garden equipment and note down distinguishing characteristics.

There are many garden tools and equipment that are required for carrying out cultural operations like hoeing, ground levelling, digging, breaking soil, removal of weeds, mowing lawns, sowing/planting, layering and grafting, manure/fertilizer application etc.

Types of gardening tools:

Types	Examples
Hand driven	
Power driven	

Tools and implements used in gardening along with their uses:

Tools and implements	Uses
Digging tools:	
Watering tools:	
Pruning, trimming and cutting tools:	

Sowing and Planting tools:

Dusters

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Sprayers

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Miscellaneous tools

Questions:

1. Describe the various types of power and hand driven tools.
2. What are the uses of dusters and sprayers?
3. Describe the different types of pruning, training and cutting tools.

Practical No. 2

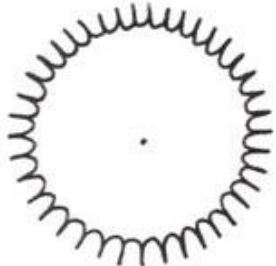
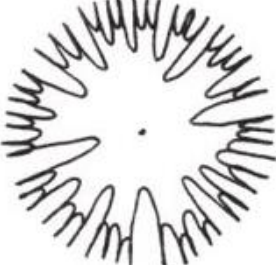
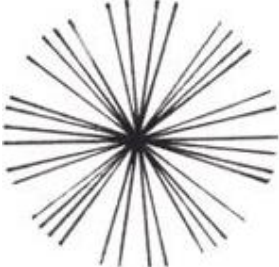
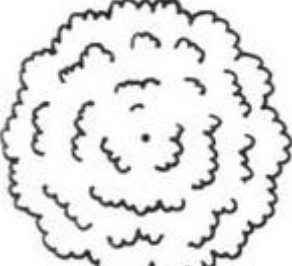
Objective: To study graphic language and use of drawing equipment, graphic symbols and notations in landscape designing

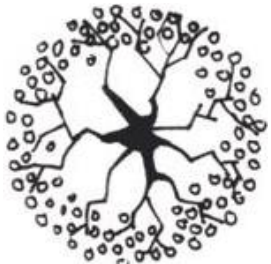
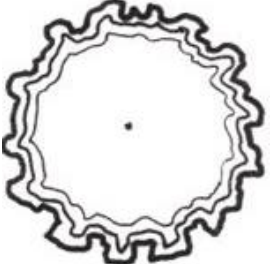

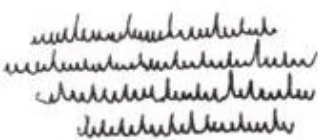

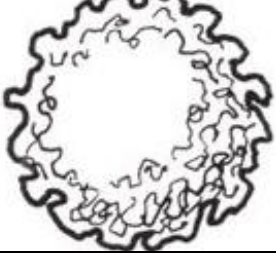

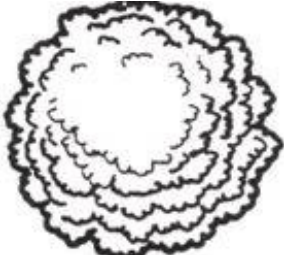
Exercise: Draw different graphic symbols used for making landscape plan.

Graphic language: The mode of communication through sketches is called graphic language. Graphic language use lines to represent the surfaces, edges and contours of objects. A drawing can be done using freehand, instruments or computer methods.

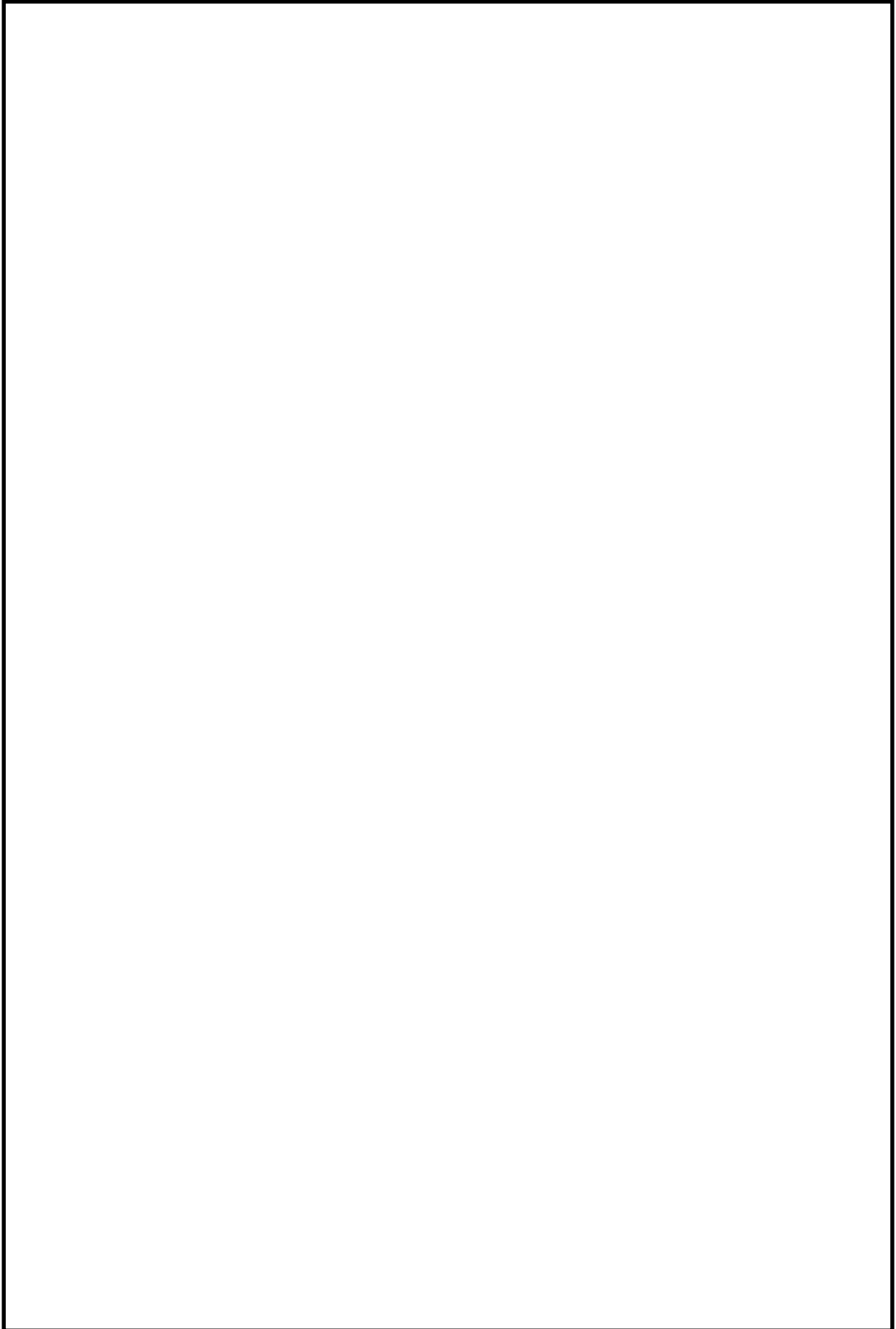
Graphic symbol: Graphics/garden symbols or signs are the pictures which are used for representing various garden components. They are mainly used in preparing the garden plan or design. Through these graphics or signs, landscape designers are able to understand and read a landscape layout without further explanations and texts.

Graphic symbols in landscaping: What do these graphic symbols denote?

Draw a design for a college building using graphic language:



Drawing equipment and instruments:

Write the uses of following instruments used in a drawing Board

Equipment/instruments	Uses and description
French Curve	
Drafting tape	
45° Triangle	
30-60° Triangle	
T square	
Scale	
Compass	
Eraser	
Dividers	
Pencil Pointer	
Dusting brush	
Erasing Shield	
Drawing board	
Drafting machine	

Instruments required for field measurement in landscaping:

Instruments	Description
Measuring tape	
Cross stop	
Ranging rod	
Pegs and bars	

Q1. Describe Graphic language:

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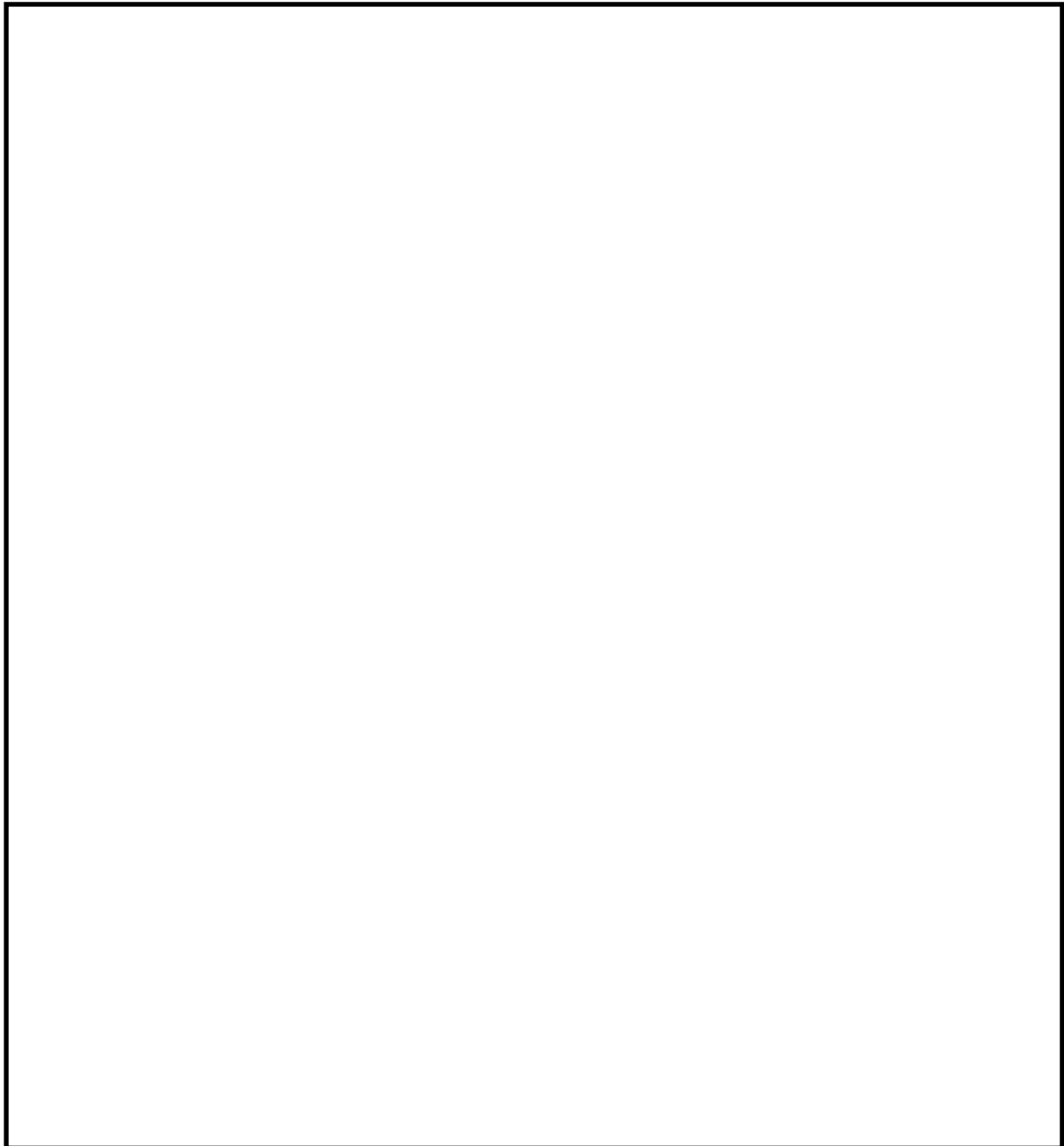
Q2. Describe Graphic symbol:

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Q3. Describe Drawing equipment:

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Exercise 2: Draw a typical formal garden depicting its main features:



Questions:

1. Differentiate between formal and informal styles of gardens citing examples

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2. What is the concept of wild gardens?

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Practical No. 4

Objective: To study and design gardens based on different themes

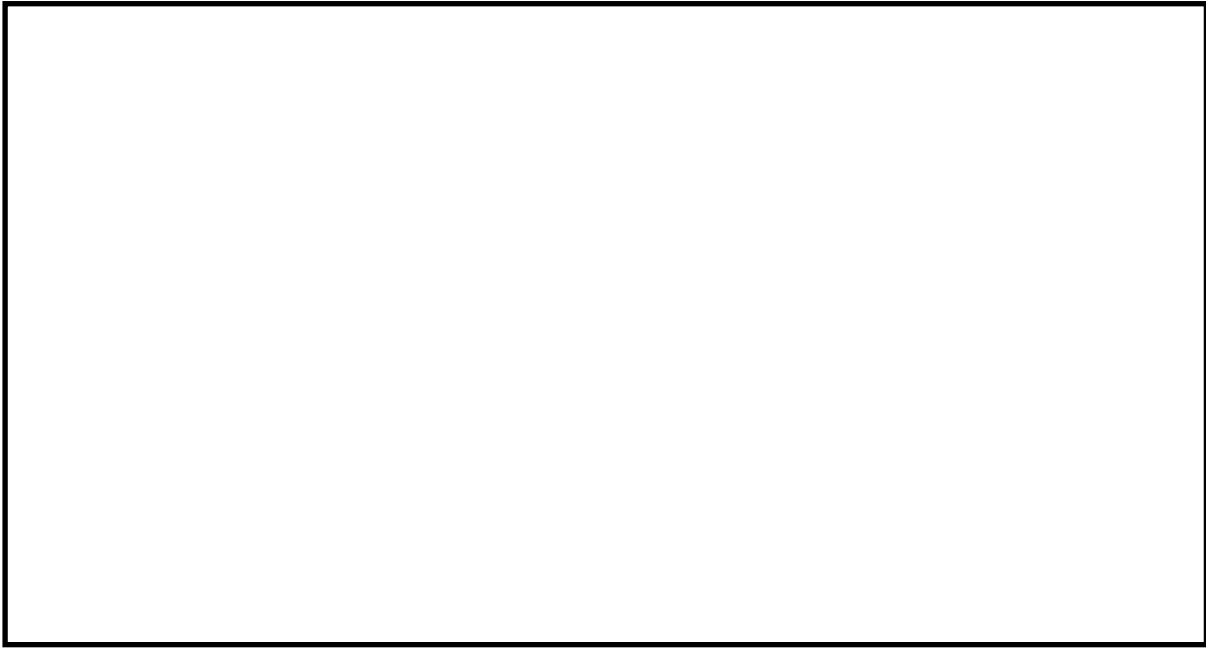
Exercise: Write down the features of gardens based on different themes and make a design of garden for given area based on different themes using coloured pencils (use scale 2 m = 1cm).

There are three basic garden pattern themes. These can be individually adapted or mixed and matched to create a personalised garden.

Circular garden theme:

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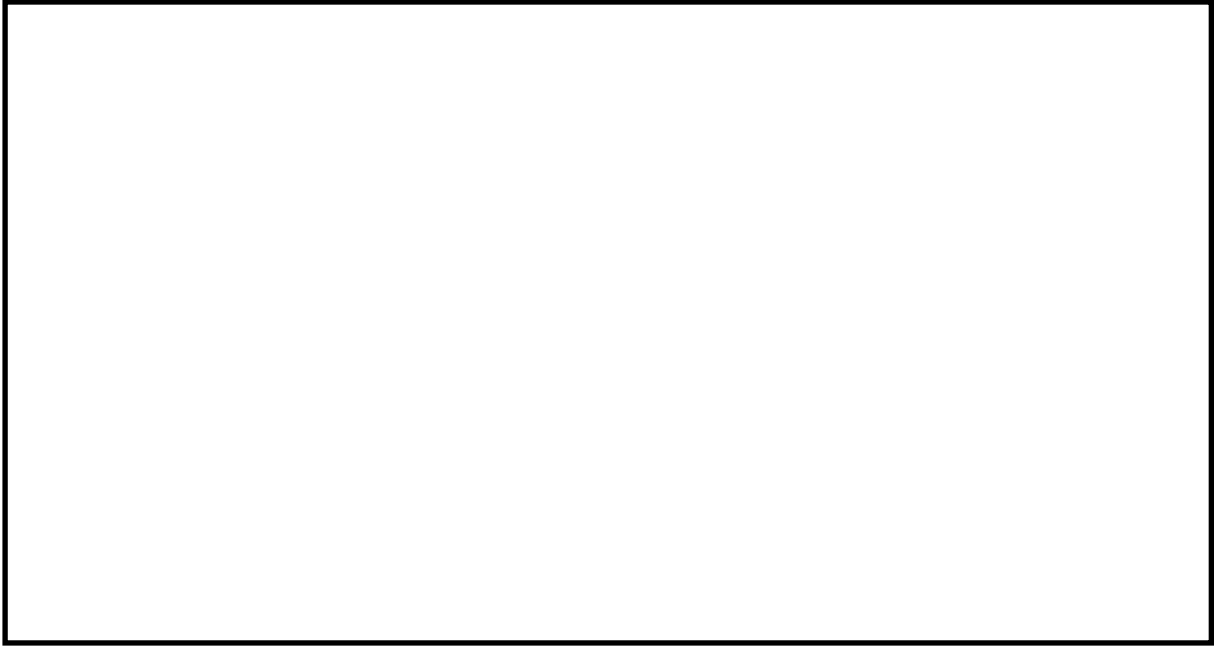
Draw a circular garden theme design:



Diagonal theme:

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Draw a diagonal garden theme design:



Rectangular themes:

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Draw a rectangular garden theme design:



Objective: To design gardens using AUTOCAD/ARCHICAD

Exercise: Give description about components of CAD system and make landscape design using Auto CAD and Archi CAD

Components of CAD system

The two main components of CAD (Computer Aided Design) system are software and hardware.

What is Software?

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What is Hardware?

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(a) Input devices:

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(b) Output devices:

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Major steps in designing garden through CAD are:

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Designing through AUTOCAD:

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Designing through ArchiCAD:

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Questions

1. What is CAD? Explain its use in landscaping.
2. Describe AUTOCAD
3. What is ArchiCAD?

Practical No. 6

Objective: To study planning and planting of avenue trees for State and National highways.

Exercise: Write down the objectives of avenue planting and make a plan using different schemes of avenue trees planting

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Description of flowering avenue trees:

Common Name	Botanical Name	Family	Flowering Time	Flower Colour	Evergreen/deciduous

Description of non-flowering avenue trees:

Common Name	Botanical Name	Family

Questions

1. What are avenue plants?
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2. What factors should be kept in mind for roadside plantation?
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3. What are the different types of trees used for roadside plantation? Enlist with common and botanical names.
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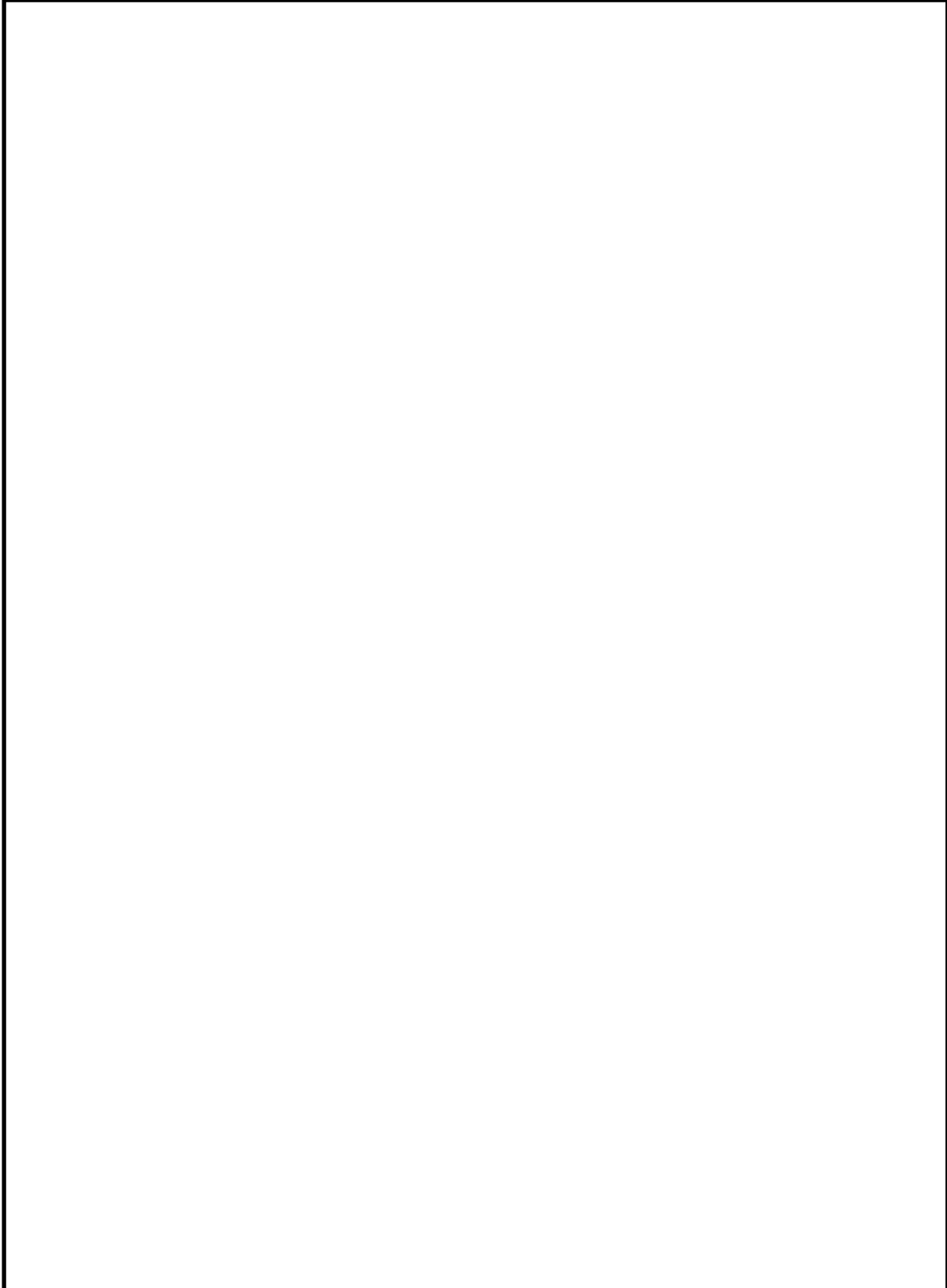
4. What should be scheme for three row planting along national highway?
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Practical No. 7

Objective: To design gardens for railway stations and airports

Exercise: Make a design of gardens for railway stations and airports using coloured pencils.

Points to be considered for scheme of planting:



Description of trees used at railway stations/airports:

Common Name	Botanical Name	Family	Flowering Time	Flower Colour	Evergreen/deciduous

Description of ornamental shrubs used at railway stations/airports:

Common Name	Botanical Name	Family	Flowering Time	Flower Colour	Evergreen/deciduous

Questions

1. What points are considered while landscaping of railway stations?

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2. What are the different trees and ornamental shrubs used for landscaping railway stations and airports? Enlist with common and botanical names.

.....

Objective: To design garden for corporate buildings and malls

Exercise: Make a design of garden for corporate buildings and malls using coloured pencils.

Corporate buildings/malls reflects brand, builds employee pride and creates a positive backdrop for making clients/consumers/visitors feel comfortable and creates a welcoming atmosphere. A good garden can reflect and enhance a corporate culture and identity and similarly attract clients in a mall. The landscaping is done both for outdoors and indoors.

Major points in designing outdoor landscaping:

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Major points in designing of interior landscaping:

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Indoor Plants: House plants refer to a group of ornamental plants, both flowering and foliage type, used for decoration of house interiors, patios, porticos, stairs, window sills etc. The group includes variety of plants viz., trees (juvenile), shrubs, herbs, bulbs/ tubers/ rhizomatous plants, succulents, etc. in many forms and growth habit, which are mainly grown in pots.

A. Foliage type: Plants having ornamental foliage but inconspicuous flowers.

Examples:

B. Flowering Type: Plants that produce conspicuous flowers are flowering type indoor plants.

Examples:

C. Ferns: Ferns are valued for their beautiful foliage beauty.

Examples:

D. Palms: Palms have elegant foliage in different forms and patterns.

Feather-leaved palms	Botanical name
Fan-leaved palms	

E. Bromeliads: Bromeliads have colourful leaves in rosette form as well as attractive inflorescence.

Examples:

F. Bulbous/ Rhizomatous plants: Bulbous plants include true bulbs but also plants that grow from tubers, corms and rhizomes. These are basically the storage organs.

Examples:

G. Succulents: Succulent are plants that are able to store moisture in succulent tissue either in leaves, stems or rootstock.

Examples:

Questions

1. Enlist the common name and botanical names of palms planted in malls.

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2. Describe about the indoor plants used in Corporate offices.

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3. Enlist the plants which can be used in hanging baskets in the corporate buildings.

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Objective: To study designing garden for home

Exercise: Make a design of garden for home using coloured pencils.

The features of home garden are its naturalness and beauty whether it is formal or informal garden. To meet this requirement the garden should have colour, harmony and balance.

The home property area is divided into following areas for landscaping:

Public or approach area:

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Family or private living Area:

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Play areas in outdoor:

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Service or utility area:

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Suitable plant species for home gardens:

Screening trees:.....

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Specimen trees:

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Shrubs:.....

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Exercises:

1. Prepare a detail list of flowering type house plants with their characters.

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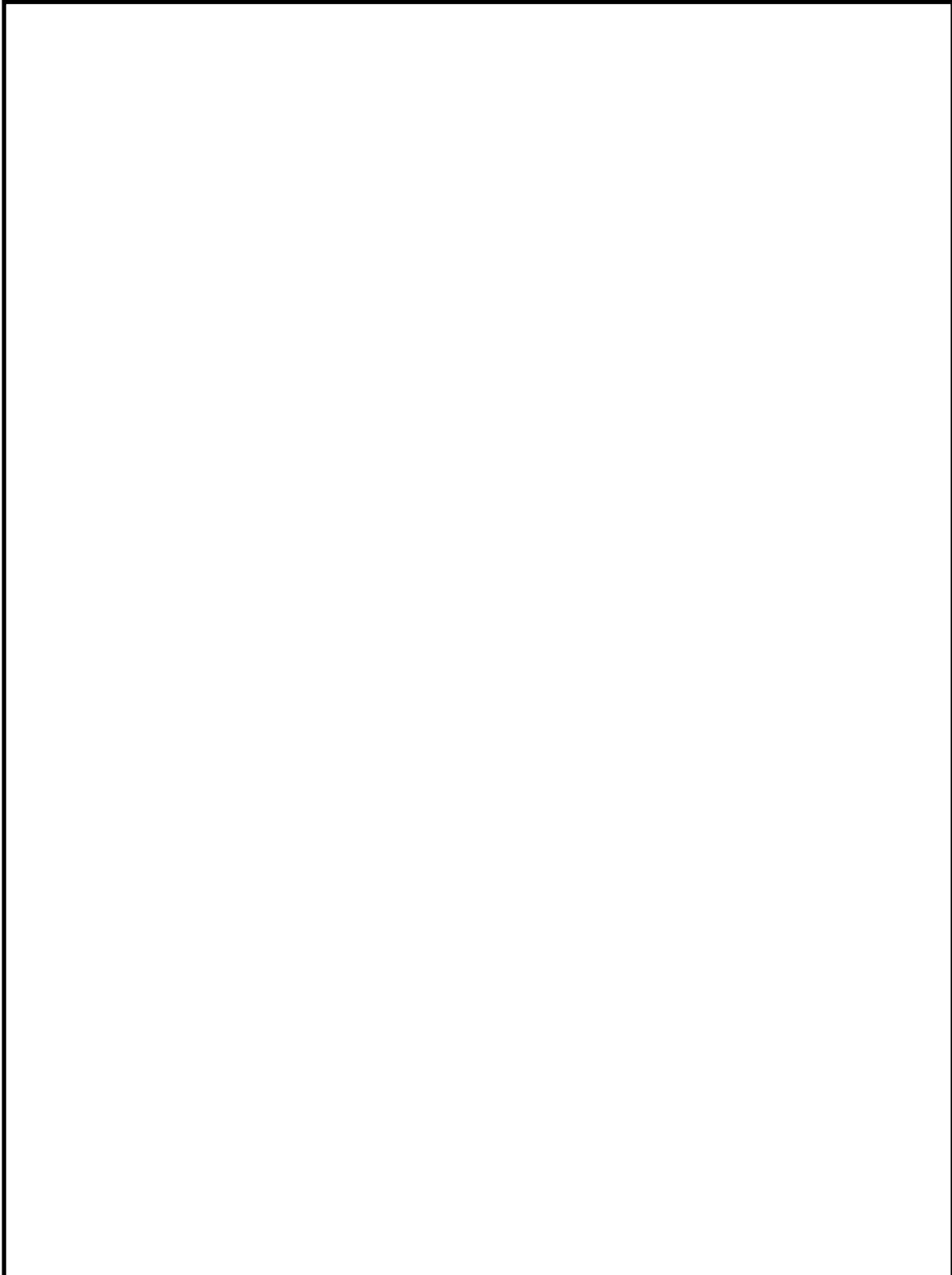
2. Prepare a detail list of foliage type house plants with their characters.

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Practical No. 10

Objective: To design garden for educational institutes (schools and colleges)

Exercise: Draw a design of garden for educational institutes (schools and colleges) using coloured pencils and scale 1m=0.5 cm



Objective: To design garden for public buildings

Exercise: Make a design of garden for public buildings using coloured pencils.

The government and private offices, courts, auditoria, cinemas, hotel and travellers bungalows fall under the group of public buildings.

Major points of consideration for Scheme of planting:

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Climbers: These are annual or perennial herb or shrub with special or modified structures viz., tendrils, thorns, rootlets etc. to climb over a support.

Common name	Botanical name	Family	Characters

Seasonal flowers:

Season	Common name of the flowers
Winter season	
Summer season	
Rainy season	

Practical No. 13

Objective: To design garden for temples and churches

Exercise: Make a design of garden for temples and churches using coloured pencils.

Temples and Churches are the places of worship. The scope of landscaping is very high as the places of worships give good scope for bio-aesthetic planning. It is important to have a garden with the right type of flowering plants.

Hindu temple: Shrubs:

Common Name	Botanical Name	Flower colour	Flowering time
Jasmine			
Crossandra			
Barleria			
Hibiscus			
Kaner			
Mogra			

Trees:

Common Name	Botanical Name	Flower colour	Flower time
Champaka			
Temple tree/ Pagoda tree			
Kadamb			
Sita Ashok			

Examples of ornamental plants in Churches:

Shrubs:

Common Name	Botanical Name	Flower colour	Flowering time

Trees:

Common Name	Botanical Name	Flower colour	Flower time

Practical No. 17

Objective: To study designing and establishment of Japanese Gardens

Exercise: Write down the features of Japanese gardens:

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Types of Japanese gardens

Hill garden:

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Tea garden:

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Flat garden:

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Passage garden:

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Sand garden:

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TOOLS AND IMPLEMENTS

Tools	Uses
Spade	To loosen the soil, prepare irrigation channels, collect the soil in heaps and facilitate filling up of soil, manure in the baskets
Garden hand rake	For removing stubbles, small stones, leveling of nursery beds and formation of small beds
Khurpi	For stirring the soil in the pots and beds and weeding
Hand cultivator	To loosen the soil, remove clods, pebbles in nursery beds and mixing of manures and fertilizers
Trenching hoe	For light collection of soil, irrigation purposes and opening of trenches
Pick Axe	For light digging and loosening the soil
Digging fork	To loosen the moist soil or manure pits
Dutch hoe	To loosen the surface soil between the rows of plants for removing small weeds
Drainage hoe	To make the drainage channel and to remove silt deposit in the channels
Pick-axe	For opening trenches, channels, digging pits, loosening soil
Hose pipe	To irrigate flower beds, lawns etc.
Water can	To water the young seedling in seed beds, potted plants
Sprinkler	For irrigating plants
Drip	For efficient water irrigation
Pop-ups	Especially for irrigating lawns
Secateurs	To prune the branches, twigs, water suckers etc. of small plants
Sickle	For cutting grasses, vegetables
Pruning shear	For cutting small sized branches
Pruning knife	For pruning of thicker branches and it has curved knife
Pruning saw	To prune the thicker branches
Lawn mower	To cut the grass uniformly in the lawn. It is having a roller behind to pad the grass to have cushion
Hedge shear	Useful for trimming hedges, borders, topiary work
Hatchet	To remove or cut down the bigger stems and broken stems
Tree pruner	To cut down the smaller branches of the trees without climbing
Grass shear	To cut the outgrowth of grasses planted in posts, carpet beds
Forester's shear	To prune the medium sized branches (4-8cm) which are at higher height on the trees
Rotary weeder	For cutting of grasses in lawn, carpet beds, edges
Carpenter's saw	To prune the bigger branches (more than 8cm diameter). It is especially useful in crown grafting
Bill hook	To cut the bigger stems near the ground surface
Axe	For felling the trees
Dibbler	To make small holes on the seed beds in order to place seeds or transplant seedlings
Hand fork	To loosen the soil in seedbeds and to break the clods
Garden trowel/shovel	For lifting more number of seedlings
Transplanting trowel	To lift the young seedlings along with a ball of earth for transplanting
Wheel barrow	To transport manures, soil, seedlings, garden waste
Budding & grafting knife	For both grafting and budding
Dusters	For spraying pesticide (Rotary duster, Plunger duster etc)
Sprayers	For uniform spraying of pesticides (Knapsack sprayer)
Tree calipers	To measure the girth of trees trunks
Crow-bar	Used for digging pits and moving rocks

LANDSCAPE SYMBOLS: When preparing landscape designs in plan view, designers use symbols that offer a suggestion of how the proposed or existing features would appear if seen from above. To be functional the symbols must be scaled to their true size. The size is actual in the case of existing objects such as buildings and streets, and eventual with the plants, which are usually drawn to scale their full or near mature size rather than their size at the time of installation or planting.

LANDSCAPE SYMBOLS USED FOR MAKING PLANS

- 1. Needled Evergreens:** these symbols suggest the spiny leaves which are green throughout the year. These symbols can be used to represent both trees and shrubs as long as they are needled and evergreen. A prominent dot at the centre marks the spot on the plan where plant is to be set into the ground.
- 2. Broadleaved Evergreen:** another group of plants are usually green throughout the year, but have wider and usually thicker, fleshy leaves. The symbols used to represent them suggest the larger leaf size and semi rigid growth habit of the plants. As with the needled evergreens, these symbols can be used for both broadleaved trees and shrubs.

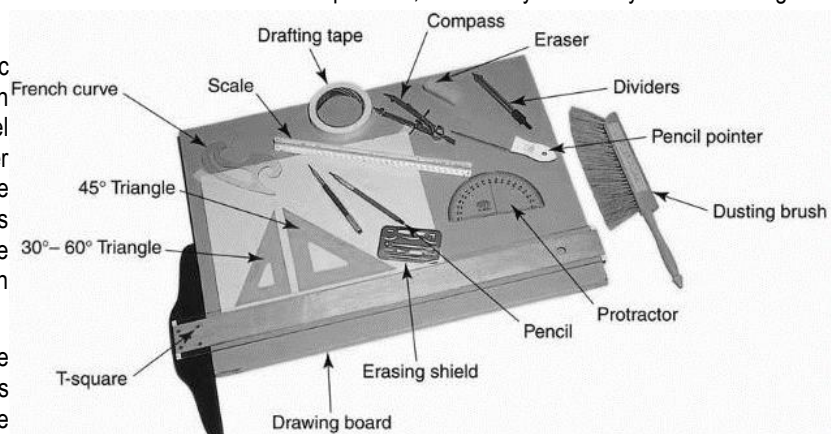
3. **Deciduous shrubs:** the edge of the plant is loose and irregular, suggestive of the plant is loose and irregular, suggestive of less rigid habit of most deciduous shrubs.
4. **Deciduous trees:** like deciduous shrubs, deciduous trees also loose their leaves during the winter season. Unlike most shrubs, trees usually have only a centre trunk rather than multiple stems. The symbols for trees are usually wider because trees are commonly larger than shrubs. The lines representing them may be thicker and/or darker too, reflecting their greater height and prominence within the design.
5. **Vines:** Vines grow in linear manner, and they do not hold to predictable shape. Their symbols are shaped to suggest that resembling linearity.
6. **Trailing ground covers:** Ground covers are those plants, usually 18 inches or less in height, that fill the planting beneath the trees and shrubs. Like vines, many ground covers are shapeless, liner plants that would have little impact on the landscape alone. The symbols used for ground covers are more textural than structural.
7. **Hardscape material:** Design materials that are not living plant materials are often referred to as hardscape. They include such things as paving, fencing, and wall materials, furnishings, lighting and water features. Like plant symbols, hardscape symbols appear in the landscape.

Explaining an idea with symbols: When one landscape object passes beneath another, the upper symbol is drawn with a wider, darker, and/or solid line, and the symbol for the object hidden beneath it is drawn with a thinner, lighter, and/or broken line. This is termed as line-weight variation.

Labelling: to make the landscape plan as useful and understandable as possible, it is usually necessary to add labeling and other notations to the plan.

Symbol labelling: All the graphic symbols used on the landscape plan must be labelled. Two methods of label placement are commonly used; either within the drawing or outside the drawing. In the latter method all labels are placed around the perimeter of the design and neatly justified, usually on right or left side.

When labelling is done within the drawing, the labels must be on or as close to the symbols as possible. The closer the symbols, the easier the plan will be to read. When scale of the design results in very small symbols, it may be necessary to code the label. That means a number or letter code is used on or near the symbol that corresponds to a lettered label placed elsewhere on the plan.



STYLES OF GARDENS

The different styles of gardening are as follows:

Formal gardens:

- A formal garden is laid out in a symmetrical or a geometrical pattern like with square and rectangular shapes.
- The outline of the garden as well as the outline of different parts like paths, flower beds, hedges and lawns is of geometrical shape.
- If there is a plant on the left-hand side of a straight road, a similar plant must be planted at the opposite place on the right-hand side i.e. both are mirror image of each other.
- In such gardens everything is planted in straight lines.
- The roads cut at right angles.
- It has a sort of enclosure or boundary.
- The arrangement of trees and shrubs are in geometrical shape and kept in shape by trimming and training. The flower beds, borders, and shrubbery are arranged in geometrically designed beds.



- Trimmed formal hedges, Cypress, Ashoka trees, and topiary are typical features of a formal garden. Examples: Mughal, Persian, Moorish garden of Spain, Italian and French styles

Informal Garden:

- In an informal garden, the whole design looks informal, as the plans and the features are arranged in a natural way and represents natural beauty. The idea behind this design is to imitate nature.
- It is contrast to formal style. Plan is asymmetrical according to the land available for making the garden.
- Smooth curvaceous out lines are more appropriate.
- Water bodies are more irregular in shape.
- Hillock is made, waterfalls provided, lakes and islands, cascades, rocks, and a rustic hutment are provided to create rural effect.
- Appropriately grouped plants provide living quality and they are not trimmed. Ex: English and Japanese gardens



Freestyle garden:

- In this style of garden design, the good points of formal, informal as well as naturalistic features are aesthetically mixed so as to create a picturesque scene.
- This style can, however, be adopted to suit the needs of almost all situations.

Wild Garden:

- A comparatively recent style of gardening, namely, "Wild Garden" was given by William Robinson in the last decade of the nineteenth century. His main idea was to naturalize plants in shrubberies.
- Grass should remain unmoved, as in nature, and few bulbous plants should be grown scattered in the grass to create a wild scenery.
- The passage to the garden should be opened in the woodland and the trees, shrubs and bulbous plants should be planted among the forest flora.
- The idea also allows the creepers to grow over the trees naturally imitating those of the forests.

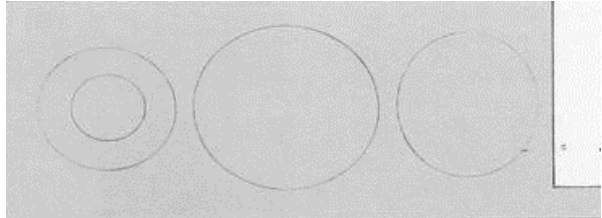


WILD TYPE GARDEN

Different themes of gardens: There are three basic garden pattern themes. These can be individually adapted or mixed and matched to create a personalised garden.

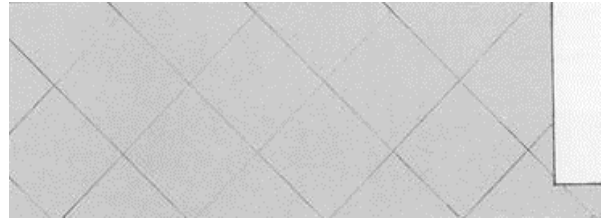
Circular gardens:

- These gardens are extremely beneficial if a predictable shape of a garden is to be disguised. These can be used to add a surprise element. The circular beds, patios and beds can be overlapped to create a beautiful garden.
- These patterns should be first captured on paper. One can use a compass to define the shapes by pairing up circles in various forms and styles. The circles need not be exactly same. Different Radii can be used for creating different shapes.



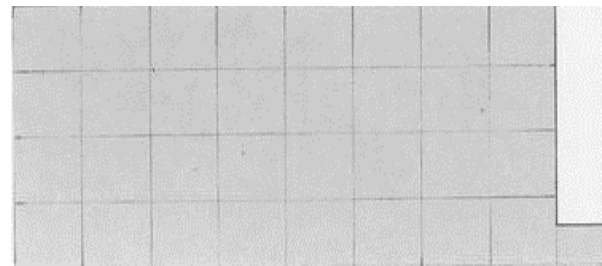
Diagonal theme:

- This theme helps the eye to move all across the garden space. Grid lines drawn at 45 degrees can be used as a guideline to design the garden.

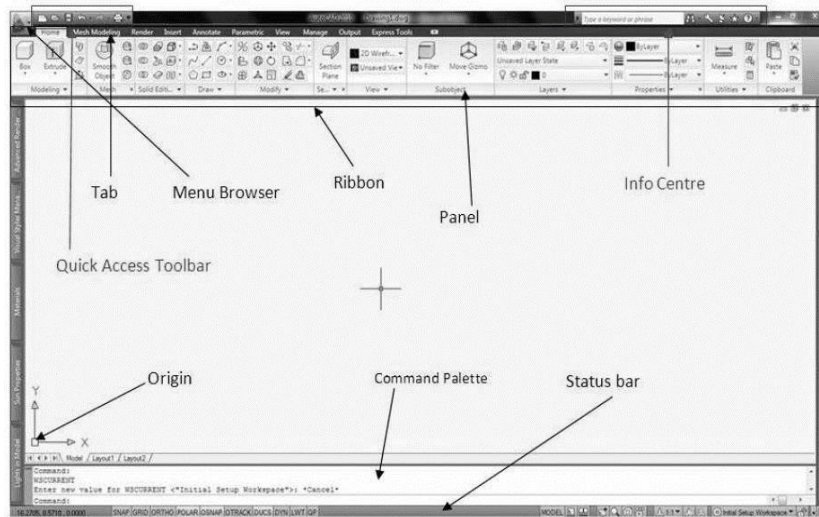


Rectangular themes:

- These are the most popular and widely used. They are adapted to give a formal look to the garden. Long or narrow gardens can be easily divided into even sections using this particular theme.



CAD Screen:



Plotter



IDENTIFICATION OF ANNUALS

Winter Season Annuals:

Sr. No.	Botanical Name	Common Name	Family	Colour	Description
1.	<i>Acroclinium roseum</i>	Paper Flower	Asteraceae	Pink & White	Grown for bedding purpose and as dry flowers for decoration.
2.	<i>Alcea rosea</i>	Hollyhock	Malvaceae	Various colours	Can be used for screening purpose, background and borders
3.	<i>Antirrhinum majus</i>	Snapdragon	Plantaginaceae	White, yellow pink, rose mauve	Bedding and pots, good cut flower
4.	<i>Arctotis stoechadifolia</i>	African Daisy	Asteraceae	White	Bedding purpose and herbaceous borders
5.	<i>Brachycome iberidifolia</i>	Swan River Daisy	Asteraceae	White, pink and blue	Bedding purpose and herbaceous borders.
6.	<i>Bracteantha viscosa</i>	Sticky paper daisy	Asteraceae	Yellow	Bedding purpose and good dry flower
7.	<i>Bellis perennis</i>	English daily	Asteraceae	White, pink, red	Bedding purpose
8.	<i>Bromus sp.</i>	-	Poaceae	Green to pale	Used as bedding plant and excellent dry flower
9.	<i>Briza maxima</i>	Greater quacking grass	Poaceae	Green to pale	Used as bedding plant and excellent dry flower
10.	<i>Calendula officinalis</i>	Pot marigold	Asteraceae	Yellow, orange	Bedding and pots
11.	<i>Callistephus chinensis</i>	China aster	Asteraceae	White, pink, blue	Bedding and pots, good cut flower
12.	<i>Centaurea cyanus</i>	Corn flower	Asteraceae	-do-	Bedding purpose
13.	<i>Centaurea moschata</i>	Sweet sultan	Asteraceae	Mauve, white, yellow	Bedding purpose and pots, scented flowers
14.	<i>Erysimum cheiri</i>	Wall flower	Brassicaceae	Yellow burnt orange	Bedding purpose and pots, scented flowers
15.	<i>Clarkia elegans</i>	Clarkia	Onagraceae	White, rose, pink, purple	Bedding purpose
16.	<i>Coreopsis tinctoria</i>	Plains tickseed	Asteraceae	Yellow	Bedding purpose
17.	<i>Coreopsis lanceolata</i>	Lance-leaved coreopsis	Asteraceae	Yellow	Bedding purpose
18.	<i>Cosmos bipinnatus</i>	Garden Cosmos	Asteraceae	White, pink, mauve, magenta	Bedding purpose and can be grown throughout the year
19.	<i>Cosmos sulphureus</i>	Sulfur Cosmos	Asteraceae	Yellow	Bedding purpose and can be grown throughout the year
20.	<i>Consolida ajacis</i>	Larkspur	Ranunculaceae	Blue	Bedding purpose
21.	<i>Dahlia variabilis</i>	Dahlia	Asteraceae	Various colours	Bedding purpose and pots
22.	<i>Dianthus barbatus</i>	Sweet William	Caryophyllaceae	White, pink and red	Bedding purpose and as cut flower, have scented flowers
23.	<i>Dianthus chinensis</i>	Chinese pink	Caryophyllaceae	-do-	Bedding purpose.
24.	<i>Dimorphotheca Sinuate</i>	African daisy	Asteraceae	White	Bedding purpose and pots
25.	<i>Eschscholtzia californica</i>	Californian poppy	Papaveraceae	Yellow and Orange	Medium growing, for bedding purpose
26.	<i>Gazania splendens</i>	Treasure daisy	Asteraceae	Yellow & dark brown	Bedding purpose and pots
27.	<i>Glebionis coronaria</i>	Annual chrysanthemum	Asteraceae	White, yellow	Bedding purpose and good loose flower.
28.	<i>Gypsophila elegans</i>	Annual baby's breath	Caryophyllaceae	White, pink yellow	Bedding purpose, good cut flowers used as fillers.
29.	<i>Helichrysum bracteatum</i>	Straw flower	Asteraceae	Yellow, white, pink	Bedding purpose and good dry flower
30.	<i>Iberis amara</i>	Candytuft	Brassicaceae	White, pink	Can be grown in pots and for edging of herbaceous border
31.	<i>Lagurus ovatus</i>	Hare's-tail/ Bunnytail	Poaceae	Green	Bedding purpose, pots and excellent dry flower
32.	<i>Lathyrus odoratus</i>	Sweet pea	Fabaceae	Various colours	Annual climber with fragrant flowers, suitable for screening and trellises.
33.	<i>Limonium sinuatum</i>	Sea-lavender /Statice	Plumbaginaceae	White, pink, yellow purple	Fairly drought resistant, very good cut flower as filler and as dry flower
34.	<i>Linaria bipartite</i>	Toadflax	Plumbaginaceae	Various colours	Can be grown in semi-shady places, good for bedding and pots.
35.	<i>Lobularia maritima</i>	Sweet Alyssum	Brassicaceae	White, lilac	Bedding purpose and pot plants
36.	<i>Lupinus hartwegii</i>	Lupin	Fabaceae	Purplish blue	For bedding purpose and as cut flower
37.	<i>Mathiola incana</i>	Stock	Brassicaceae	White, purple, yellow	For bedding purpose and good cut flower
38.	<i>Dorotheanthus bellidiformis</i>	Ice plant	Aizoaceae	Pink, white, yellow	Leaves are fleshy and have small dew like natural eruptions. For edging, pots, hanging baskets, rockery.
39.	<i>Euryops chrysanthemoides</i>	African bush daisy	Asteraceae	Bright yellow	Edging plant and pots
40.	<i>Mimulus tigrinus</i>	Tiger Monkey flower	Phymaceae	yellow with brown blotches	Partially shady places, suitable, good for pots

41.	<i>Moluccella laevis</i>	Bells of Ireland	Lamiaceae	Green like bells	Used in flower arrangements and good dry flower
42.	<i>Nemesia strumosa</i>	Nemesia	Scrophulariaceae	Yellow, red, orange	Bedding and pots
43.	<i>Nigella damascena</i>	Love -in- a -mist	Ranunculaceae	Blue, white, purple	Sunny areas and pods are used as dry flowers
44.	<i>Petunia hybrida</i>	Petunia	Solanaceae	Various colours	Good for pots, hanging baskets, bedding purpose
45.	<i>Phlox drummondii</i>	Drummond's Phlox	Polemoniaceae	Various colours	Dwarf plants are very showy when grown in borders, baskets and pots
46.	<i>Papaver orientale</i>	Common poppy	Papaveraceae	Red	Good for bedding purpose, herbaceous borders
47.	<i>Primula melacoides</i>	Fairy primrose	Primulaceae	Mauve, pink, white	Good for bedding purpose and pots. Suitable for temperate areas.
48.	<i>Salvia splendens</i>	scarlet sage	Lamiaceae	Scarlet, red, white, purple	Easily grown in shady places and rockery, used as bedding plant and in pots
49.	<i>Senecio cruentus</i>	Cineraria	Asteraceae	Various colours	Grown in shady places, good for bedding purpose and pots
50.	<i>Tagetes erecta</i>	African Marigold	Asteraceae	Yellow, orange	Easily grown, good for bedding, pots and commercially grown for loose flowers
51.	<i>Tagetes patula</i>	French Marigold	Asteraceae	Yellow, orange, red	Hardy annual used for bedding purpose, pots and as loose flower.
52.	<i>Torenia fournieri</i>	Wishbone flower	Linderniaceae	blue ,purple, pink, rose and white	blooms abundantly in shady conditions, good for edging and containers
53.	<i>Tropaeolum majus</i>	Nasturtium	Tropaeolaceae	-do-	Mostly grown in rockeries. It has trailing habit, so used as climbers and in hanging baskets.
54.	<i>Verbena hybrida</i>	Verbena	Verbenaceae	Purple, pink, blue, red, white	Good for bedding purpose, pots, hanging baskets, window boxes and rockery.
55.	<i>Viola wittrockiana</i>	Pansy	Violaceae	Yellow, blue, red, purple, violet bicolor	Sunny location is preferred, good for bedding and hanging baskets. Flowers resembles with the butterflies

Summer and rainy season annuals

S. No	Botanical Name	Common Name	Family	Colour	Remarks
1	<i>Celosia cristata</i>	Cock's comb	Amaranthaceae	Pink, yellow, orange	Very hardy and longer flowering period and makes good crest
2	<i>Celosia plumosa</i>	Plumed cockscomb	Amaranthaceae	Pink, yellow, orange	Flowers like plume of ostrich. Good for bedding purpose.
3	<i>Amaranthus caudatus</i>	Love-lies-bleeding	Amaranthaceae	Pink & White	Due to variegated leaves, it is also grown in pots for indoor decoration
4	<i>Gaillardia pulchella</i>	Blanket flower	Asteraceae	Yellow, orange scarlet brown	It can resist dry conditions and can be grown as perennial also. Good cut flower
5	<i>Gomphrena globosa</i>	Bachelor's button	Amaranthaceae	Pink, Magenta	Good for dry conditions and used as dry flower.
6	<i>Helianthus annuus</i>	Sunflower	Asteraceae	Yellow orange	Can be grown throughout the year and sown directly from seeds into permanent places
7	<i>Portulaca grandiflora</i>	Moss Rose	Portulacaceae	Various colours	Easily propagated by cutting, can be grown in pots, hanging basket and small boxes.
8	<i>Bassia scoparia/ Kochia scoparia</i>	Summer Cypress	Amaranthaceae	---	Mostly grown for foliage beauty due to uniform, well-shaped and bushy growth.
9	<i>Impatiens balsamina</i>	Balsam	Balsaminaceae	Various colours	Early flowering and for short duration, very delicate and needs much care
10	<i>Impatiens walleriana</i>	Impatiens	Balsaminaceae	pink, red or white	Suitable for pots and bedding purpose.
11	<i>Tithonia speciosa</i>	Mexican Sunflower	Asteraceae	Orange, scarlet	Sown directly from seeds
12	<i>Catharanthus roseus</i>	Periwinkle	Apocynaceae	Purple, Pink white	Can be grown throughout the year
13	<i>Zinnia elegans</i>	Zinnia	Asteraceae	Various colours	Very hardy and grown easily for longer duration

CLASSIFICATION OF TREES

Ornamental flowering trees: Grown for the beauty of their showy and ornamental flowers.

Sr. No.	Botanical Name	Common Name	Family	Flower colour and time	Description
1.	<i>Acacia auriculiformis</i>	Earleaf Acacia/ Auri	Fabaceae	Yellow, August-September	An evergreen tree with pendulous branches and phyllodes leaves. The tree is medium sized
2.	<i>Alstonia scholaris</i>	Devil's tree	Apocynaceae	Greenish white, March-April	It is tall, spreading and shady tree. Leaves are shiny and dark green. The tree bears small greenish white flowers during Nov –Dec.
3.	<i>Azadirachta indica</i>	Neem	Meliaceae	White, April- May	10-15 m high, good shady tree. It grows successfully on rocky and alkaline soils. Very good shade tree for tropical/sub-tropical areas

4.	<i>Bauhinia purpurea</i>	Orchid tree/ Purple Bauhinia	Fabaceae	Rosy- purple, Nov – Feb.	A medium sized tree suitable for avenue planting,
5.	<i>Bauhinia tomentosa</i>	Yellow Bauhinia/ Orchid tree	Fabaceae	Yellow, April- June	A small tree with drooping branches which bear showy yellow flowers and suitable for growing in gardens.
6.	<i>Bauhinia variegata</i>	Orchid tree / Kachnar	Fabaceae	White-pink, Feb- April	A small sized tree, bear flowers when the tree is leafless. The flowers are edible and used for culinary purpose.
7.	<i>Bombax ceiba</i>	Silk Cotton tree/ Simbal	Malvaceae	Red, orange, Jan- March	A large deciduous tree, stem is straight and undivided. The young stem is covered with sharp prickles. It bears flowers when tree is leafless.
8.	<i>Butea monosperma</i>	Dhak/Palash/ flame of the forest	Fabaceae	Orange red, March- April	A small deciduous tree having irregular branches. It bears showy flowers when the tree is leafless. It is drought resistant tree and can be grown in alkaline soils
9.	<i>Callistemon lanceolatus</i>	Bottle Brush	Myrtaceae	Red, Round the year	A beautiful small tree having weeping habit, the crowded scarlet flowers are borne in spikes almost throughout the year.
10.	<i>Cassia fistula</i>	Indian Laburnum/ Amaltas	Fabaceae	Yellow, May- June	A medium sized shady tree, bears pendulous racemes of large bright yellow flowers, when tree is leafless. It is drought-resistant and can tolerate quite a high salt levels.
11.	<i>Cassia javanica</i>	Java Cassia	Fabaceae	Pink, May- June	A medium sized tree with spreading crown, bears clusters of pink flowers with the foliage.
12.	<i>Cassia renigera</i>	Burmese Pink Cassia	Fabaceae	Pink, May- July	It bears flowers in clusters giving appearance of bunches of roses on long branches.
13.	<i>Cassia siamea</i>	Kasod tree	Fabaceae	Yellow, Nov- Feb	A medium sized shady tree. It is drought resistant and can tolerate lot of dust. It is suitable for planting along roadside.
14.	<i>Ceiba speciosa</i>	Silk floss tree	Malvaceae	Pink, July- August	It is beautiful tree with a bottle shaped green thorny trunk
15.	<i>Delonix regia</i>	Gulmohar/ Royal Poinciana	Fabaceae	Scarlet red, April- June	A large tree with umbrella like crown and feathery leaves.
16.	<i>Erythrina indica/ E. variegata</i>	Indian Coral tree	Fabaceae	Scarlet, crimson, March- April	A quick growing tree. It bears flowers when the tree is leafless.
17.	<i>Grevillea robusta</i>	Silver oak	Proteaceae	Yellow, April- June	An evergreen tree with a conical crown. The leaves are fern like and silvery from the lower side. It bears coppery yellow flowers in April.
18.	<i>Jacaranda mimosaeifolia</i>	Neeli Gulmohar	Fabaceae	Purple-mauve, March- May	Medium to large sized tree, with feathery bipinnate leaves. Quick growing tree suitable for avenue planting
19.	<i>Kigelia pinnata</i>	Sausage tree	Bignoniaceae	Dark red-maroon, April- May	A large tree with good spreading crown. Sausage like fruits borne on long pendulous stalks can be seen hanging on trees.
20.	<i>Lagerstroemia speciosa/ L. flos-reginae</i>	Giant Crepe Myrtle	Lythraceae	Mauve/ pinkish, April to August	A medium sized deciduous tree. Suitable for avenue planting.
21.	<i>Madhuca indica</i>	Mahua	Sapotaceae	Cream, Feb-March	Fast growing large deciduous tree. The leaves are borne in clusters near the end of the branches and are coppery coloured when young. The flowers are used for making vegetables and wine.
22.	<i>Magnolia champaca</i>	Champak/ Champa	Magnoliaceae	Light yellow, May- September	A medium sized evergreen tree. Bears fragrant flowers
23.	<i>Magnolia grandiflora</i>	Bara champa	Magnoliaceae	White, April- May	A medium sized, evergreen tree with beautiful foliage, large scented white flowers.
24.	<i>Millingtonia hortensis</i>	Tree jasmine/ Indian cork tree	Bignoniaceae	White, April- June	A tall evergreen tree which bears sweet scented flowers. The tree is quick growing.
25.	<i>Millettia ovalifolia</i>	Molumein rosewood	Fabaceae	Light pink, pink, Feb- March	A medium sized tree. Bears profuse flowers when the tree is leafless
26.	<i>Peltophorum pterocarpum</i>	Yellow Flamboyant	Fabaceae	Yellow, Sept- November	Deciduous tree with bipinnate leaves, erect trunk and suitable for avenue planting
26.	<i>Plumeria acutifolia</i>	Pagoda tree/ Temple tree	Apocynaceae	White, April- November	Dwarf evergreen tree with large green leaves with acute tips.
27.	<i>Plumeria alba</i>	Pagoda tree/ Temple tree	Apocynaceae	White, April- November	Dwarf evergreen tree with large glabrous dark green leaves with round tip, bear fragrant flowers
28.	<i>Plumeria rubra</i>	Red Frangipani	Apocynaceae	Pinkish red, red, April- November	Dwarf deciduous tree with large dark green conical leaves, bear red flowers

29.	<i>Saraca indica</i>	Sita Ashoka	Fabaceae	Bright orange-Red, April – May	Evergreen tree with drooping branches, bear fragrant flowers.
30.	<i>Spathodea campanulata</i>	Fountain tree/ African Tulip tree	Bignoniaceae	Red, Feb-May.	Monotypic genus in the family Bignoniaceae, A medium sized tree. Flower on pressing trickles out water like a fountain.
31.	<i>Tabebuia rosea</i>	Rosy trumpet tree	Bignoniaceae	Deep rose pink, Feb-April	Large tree which bears flowers when leafless.
32.	<i>Tabebuia argentea</i>	Silver trumpet tree	Bignoniaceae	Yellow, March- May	Quick growing tree, bears flowers when leafless. Suitable for avenue planting.
33.	<i>Tecomella undulata</i>	Roheda	Bignoniaceae	Orange, March- April	It is dwarf tree, evergreen to semi-deciduous tree suitable for dry and desert areas.

2. Foliage trees: Trees grown for their showy ornamental foliage or for providing shade in garden.

S. No.	Botanical Name	Common Name	Family	Description
1.	<i>Alstonia scholaris</i>	Sat Patia or Devil's tree	Apocynaceae	Bright green leaves borne in cluster of seven. It is good shady tree, used for avenue planting and near parking areas
2.	<i>Araucaria cookii</i>	Monkey Puzzle Tree	Araucariaceae	It has symmetrical growth habit. Good for planting as specimen tree. Propagated from seed.
3.	<i>Casuarina equisetifolia</i>	Australian pine tree	Casuarinaceae	Tall columnar tree with needle like leaves, suitable for wind breaks
4.	<i>Cedrus deodara</i>	Cedar pine/ Deodar	Pinaceae	Evergreen pine tree of temperate areas, suitable for roadside planting and timber.
5.	<i>Cupressus sempervirens</i>	Saru	Cupressaceae	Conical tree with thin foliage and suitable for planting in the graveyard.
6.	<i>Dillenia indica</i>	Chalta	Dilleniaceae	Dwarf slow growing tree with shiny green serrated leaves.
7.	<i>Eucalyptus spp.</i>	Blue gum tree/ Safeda	Myrtaceae	Slender trunk, smooth clean few branches lemon scented leaves. Grow rapidly and planted as avenues on marshy land.
8.	<i>Eugenia jambolina</i>	Jamun/ Java plum	Myrtaceae	Tall and spreading with dark green foliage, suitable for providing shade. It bears fruits and attract birds.
9.	<i>Ficus benghalensis</i>	Bohr or Banyan tree	Moraceae	Tall, round shaped foliage tree, usually grown for providing shade in gardens.
10.	<i>Ficus religiosa</i>	Pipal	Moraceae	Tall, evergreen, round shaped tree usually grown for providing shade in gardens.
11.	<i>Ficus elastica</i>	Rubber tree	Moraceae	Evergreen medium size tree, bright shining blackish green leaves, can be used as a specimen tree and as a pot plant.
12.	<i>Juniperus chinensis</i>	Chinese Juniper	Cupressaceae	Conical growth habit and fine needle like thin green leaves, can be planted as pot plant or as specimen.
13.	<i>Melia azedarch</i>	Chinaberry tree/ Drake	Meliaceae	Winter deciduous tree, light green shiny foliage, suitable for plantation as shady tree
14.	<i>Melaleuca bracteata</i>	Golden Bottle brush	Myrtaceae	Tree with pendulous branches, leaves are golden-greenish in colour.
15.	<i>Mimusops elengi</i>	Spanish cherry. Maulsari	Sapotaceae	Slow growing tree with round canopy and dark green foliage, bears scented flowers
16.	<i>Polyalthia longifolia</i>	False Ashok	Annonaceae	Tall evergreen tree with a symmetrical columnar crown, good for screening and roadside planting.
17.	<i>Pinus roxburghii</i>	Chirpine	Pinaceae	Evergreen pine tree grown in hills. It can be grown as specimen tree.
18.	<i>Pongamia pinnata</i>	Pongam tree	Fabaceae	Medium size shady tree with dark green foliage, bears purplish white flowers.
19.	<i>Pterospermum acerifolium</i>	Bayur tree/ Kanak Champa	Malvaceae	Medium sized evergreen tree with beautiful foliage and creamish yellow scented flower which appears from April to June.
20.	<i>Pterygote alata/ Sterculia alata</i>	Buddha coconut	Malvaceae	Tall slow growing tree with broad leaves, less spreading, suitable for planting as avenue tree.
21.	<i>Putranjiva roxburghii</i>	Putrajiva	Putranjivaceae	Large tree with a semi-globular crown dense glossy, foliage, good for avenues.
22.	<i>Terminalia arjuna</i>	Arjun tree	Combretaceae	Large evergreen shady tree. Flowers are not showy. Suitable for planting along roads and in groups for shade.

TREES FOR SPECIFIC CONDITIONS

Wind resistant trees	<i>Eugenia jambolana, Caesalpinia pulcharima, Peltophorum pterocarpum.</i>
Salt resistant trees	<i>Azadirachta Indica, Acacia sp., Butea monosperma, Azadirachta indica, Bassia latifolia, Eucalyptus citriodora, Phoenix dactylofera and Phyllanthus emblica.</i>
Drought resistant	<i>Butea monosperm, Acacia sp., Albizzia lebbek, Casuarina equisetifolia. Crataeva religiosa.</i>
Wet land trees	<i>Nyctanthes arbortristis, Dillenia indica, Michelia champaca, Saraca indica, Thespesia populnea, Salyx babylonica, Eucalyptus eostata, Guaiacum officinalis.</i>

Fast growing Trees	<i>Pongamia glabra, Sesbania grandiflora, Cananqium odoratum, Erithrina Indica, Thespesia populnea, Populus sp., Salix sp., Euclyptus sp., Thuja compacta.</i>
Shade giving trees	<i>Pteropsperum acerifolium, Albizzia lebbek, Peltophorum, Michelia champaca, Anthocephalus cadamba, Dalbergia sisso, Glyricidia Maculata accer sp., Cornus florida.</i>
Trees tolerant to dust and smoke	<i>Acacia auriculiformis, Alstonia soholaris, Butea monosperma, Ficus Benjamina, F. benghalensis, Madhuca Indica, Pongamia glabra, Ficus religiosa, Terminalia Arjuna, Albizzia llebbek, Bombax ceiba</i>
Trees for noise reduction	<i>Terminalia Arjuna, Alstonia scholaris, Azadirachta Indica, Butea Monosperma, Mangifera indica, Madhuca indica, Juniperus chinesis, EucalyptusCitradora, Kigelia pinnata</i>

IDENTIFICATION OF SHRUBS

Flowering shrubs: Shrubs are grown for their beautiful flowers.

S. No.	Botanical Name	Common Name	Family	Flowering time	Identifying characters
1.	<i>Abelia grandiflora</i>	Abelia	Caprifoliaceae	May-June	It grows to a height of 1.5-2m, spreading habit and propagated through cuttings.
2.	<i>Abutilon pictum</i>	Chinese lantern	Malvaceae	Orange-yellow	Short shrub, propagated from seeds and cuttings and prefer partial shade.
3.	<i>Acalypha hispida</i>	Chenille plant/ Cat's tail	Euphorbiaceae	Throughout the year, red	Bushy shrub with dark green foliage and long red coloured fuzzy pendulous inflorescence which looks like cat's tail.
4.	<i>Achania malvaviscus</i>	Sleeping Hibiscus	Malvaceae	Throughout the year, red	Popular shrub used as hedge, easily propagated from cuttings
5.	<i>Asclepias currassavica</i>	Milk weed	Asclepiadaceae	Summer season Orange-yellow	As a specimen shrub, good for border, propagated from seed or cuttings
6.	<i>Barleria cristata</i>	Philippine violet	Acanthaceae	Oct-Dec. Violet blue, pink, white	It is a small shrub, winter deciduous in nature propagated from seed.
7.	<i>Bauhinia tomentosa</i>	Bell bauhinia	Leguminosae	August-October Sulphur yellow	5-8 m high, winter deciduous shrub, quick growing. Grown for foliage and flower beauty. Propagated from seed.
8.	<i>Bougainvillea spp</i>	Bougainvillea	Nyctaginaceae	Red, yellow, white, purple, pink	It is a multipurpose shrub, quick growing. Hardy and can be grown under neglected conditions for screening purpose.
9.	<i>Brugmansia suaveolens</i>	Datura	Solanaceae	Pink flowers	Very good landscape plant, prefers partial shade.
10.	<i>Caesalpinia pulcherrima</i>	Peacock flower	Leguminosae	May-Aug. Scarlet, yellow	It is medium sized shrub grown for foliage and flower beauty. It is a quick growing shrub suitable for dry areas.
11.	<i>Calliandra brevipes</i>	Pink Powder puff	Leguminosae	Red, pink, white	It is medium to tall, evergreen shrub with beautiful foliage.
12.	<i>Camellia japonica</i>	Camellia	Theaceae	April-June Red, Pink	Very good specimen shrub suitable for high elevations.
13.	<i>Carissa carandus</i>	Karonda	Apocynaceae	March-April, white	A good hedge plant and can be planted in a large shrubbery.
14.	<i>Cascabela thevetia/ Thevetia peruviana</i>	Pili Kaner	Apocynaceae	Year round, Yellow	Tall evergreen shrubs with shining leaves, for roadside plantation and screening, propagation is from seed.
15.	<i>Cassia biflora</i>	Desert Cassia	Leguminosae	Feb-April Yellow	It is 6-8 ft. in height propagated from seed and air layering, used as specimen shrub.
16.	<i>Cassia glauca</i>	Scrambled egg bush	Leguminosae	Mar-May, Sept. – Nov., Yellow	It is tall, evergreen, quick growing shrub suitable for arid areas.
17.	<i>Cestrum diurnum</i>	Din ka Raja	Solanaceae	June-Aug White	It is medium sized quick growing, evergreen shrub with blue berries.
18.	<i>Cestrum elegans</i>	Pink Cestrum	Solanaceae	Sept-Dec. Purple red	A plant suitable for temperate climate and high altitudes.
19.	<i>Cestrum nocturnum</i>	Rat ki Rani	Solanaceae	Spring & Rainy season white	It is 5-6 ft high, evergreen, hardy quick growing shrub, propagated from cuttings, fragrant flowers open at night.
20.	<i>Clerodendrum thomsonae</i>	Bleeding heart	Verbenaceae	Rainy season Scarlet with white calyx	Very attractive shrub/climber suitable for tropical areas.
21.	<i>Cotoneaster microphyllus</i>	Rockspray Cotoneaster	Rosaceae	White flowers	Prostrate trailing shrubs, climbs over rocks and suitable for rock gardens.
22.	<i>Cuphea hyssopifolia</i>	False Heather	Lythraceae	July-September blue flowers	Evergreen shrub suitable as good edging plant bearing pinkish purple flowers.

23.	<i>Galphimia gracilis</i>	Golden shower	Malpighiaceae	Jul-Nov. Yellow	It is evergreen medium shrub, can be used as hedge. Propagated through seed.
24.	<i>Gardenia jasminoides</i>	Gandhraj	Rubiaceae	March-Sept. White	Evergreen medium shrub. Grown as a specimen shrub, bears sweet scented flowers.
25.	<i>Hamelia patens</i>	Firebush/ humming birdbush	Rubiaceae	Year round Red	Tall shrub. On rockery it can be trained as small bush, grown for the foliage and flower beauty and for screening.
26.	<i>Hamiltonia suaveolens</i>	-	Rubiaceae	Feb-March Lavender	Medium to large shrub 6-8'. Propagated from cutting, used for group plantation.
27.	<i>Hibiscus mutabilis</i>	Changeable Rose	Malvaceae	White to Pink to red	It is tall growing, deciduous shrub with large leaves..
28.	<i>Hibiscus rosa-sinensis</i>	China Rose	Malvaceae	Year round White, pink rose, yellow	Evergreen medium sized. Used for making flowering hedge.
29.	<i>Hibiscus syriacus</i>	Rose of Sharon	Malvaceae	Summers, White & Mauve	Deciduous shrub 5-6'. Propagated from cuttings. Good for temperate climatic areas.
30.	<i>Holmskioldia Sanguinea</i>	Cup-n-Saucer	Verbenaceae	Yellow, red	Medium sized shrub. Long branches used for dry decoration.
31.	<i>Ixora coccinea</i>	Jungle geranium	Rubiaceae	Deep scarlet July-Aug	Evergreen specimen shrub. Prefers partial shade for growth.
32.	<i>Ixora parviflora</i>	-do-	Rubiaceae	White, Mar-Apr	Tall evergreen specimen shrub with sweet scented flowers.
33.	<i>Ixora singaporiensis</i>	-do-	Rubiaceae	Pinkish red	Dwarf shrub, used as a specimen bush. Prefers partial shade for growth.
34.	<i>Jacobinia carnea</i>	Jacobinia	Acanthaceae	Orange	4-5' evergreen shrub, bears tubular orange flower, grown for making flowering hedge.
35.	<i>Jasminum humile</i>	Peeli chamei	Oleaceae	Feb-Mar, Yellow	Evergreen shrub. Thrives well in poor soil, can be used as climber.
36.	<i>Jasminum sambac</i>	Motia	-do-	March-Sept. White	Dwarf shrub, planted for sweet scented flowers. Propagated by suckers and cuttings.
37.	<i>Lagerstroemia indica</i>	Sawani	Lythraceae	May-Aug Mauve, pink and white	Tall, winter deciduous shrub, Propagated from cuttings.
38.	<i>Lantana sellowiana</i>	Trailing Lantana	Verbenaceae	Year round Pale mauve	Medium shrub, evergreen, good for planting on mounds and rockeries.
39.	<i>Mussaenda frondosa</i>	Mussaenda	Rubiaceae	Summers White sepals	Evergreen shrub. Long white sepals form a part of flowers.
40.	<i>Nerium oleander</i>	Kaner	Apocynaceae	May-Oct White, pink, Red	Evergreen shrub. Suitable for roadside plantation, screening. Variegated varieties are used as specimen plant.
41.	<i>Nyctanthes arbor-tristis</i>	Parijaat/ Har-Shingar	Oleaceae	October- January White with orange peduncle	Tall evergreen shrub, with numerous sweet-scented flowers, propagation is from seed.
42.	<i>Plumbago capensis</i>	Chitra	Plumbaginaceae	Mar.-Oct., White turn light blue	Evergreen shrub, used as ground cover, pot plant or for foundation plantation.
43.	<i>Poinsettia pulcherrima</i>	Christmas Flower	Euphorbiaceae	Dec.-Jan Yellow and Red	Deciduous shrub, 5-6 ft height, terminal leaves look like flowers.
44.	<i>Ruellia simplex</i>	Mexican petunia	Acanthaceae	Spring to summers, Purple, pink, white	Thriving best under semi-shade, suitable for shrubbery and hanging baskets.
45.	<i>Russelia juncea</i>	Fire cracker plant	Scrophulariaceae	June to Aug, Coral red	Dwarf, evergreen shrub, used as foundation plant, bears tube like flowers. Used in bouquet making.
46.	<i>Tabernaemontana coronaria</i>	Pinwheel flower/ Chandni	Apocynaceae	Round the year, white	Tall evergreen shrub with glossy leaves used in shrubbery, specimen shrub, avenue and screening.
47.	<i>Tecoma stans</i>	Yellow trumpet bush	Bignoniaceae	Year round, Golden yellow	Dwarf growing shrub grown in shrubbery or as hedge.
48.	<i>Thunbergia erecta</i>	Purple king's mantle	Acanthaceae	Year round Dark blue	Medium sized evergreen shrub, used for making flowering hedge.
49.	<i>Volkmeria inermis / Clerodendrum inermi</i>	Forest Jasmine	Verbenaceae	July-Nov. White	It is evergreen shrub, good for hedge making, can be trained for topiary making and good for dry areas.

Foliage shrubs: These shrubs are grown for their foliage either green or variegated

S. No.	Botanical Name	Common Name	Family	Identifying characters
1.	<i>Acalypha wilkensisiana</i>	Acalypha	Euphorbiaceae	It is 3-4 ft. in height. It is good for hedge, foundation plantation and pot plant. It prefers partial shade for healthy growth.
2.	<i>Duranta repens</i>	Golden Dewrop	Verbenaceae	Medium sized, suitable for dry areas, propagated through cuttings.

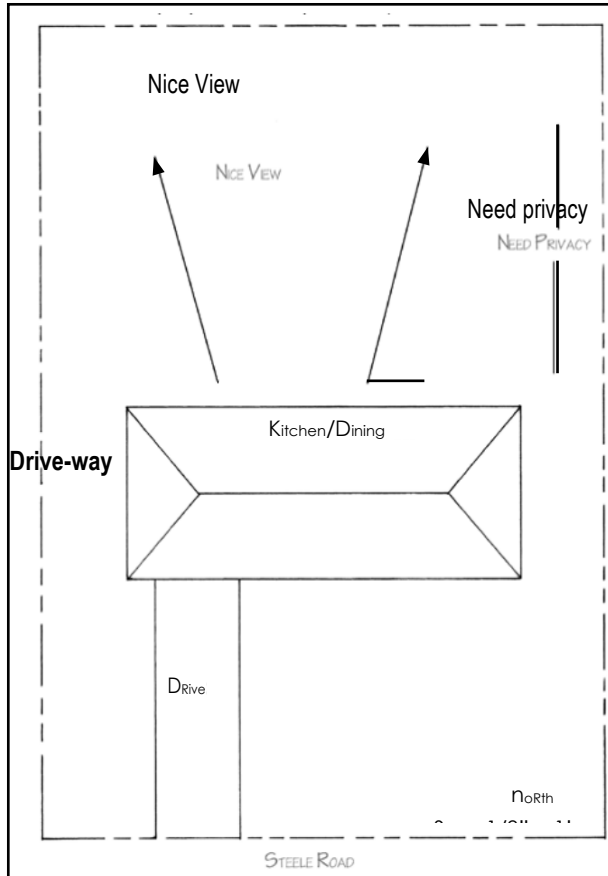
				Used for edge & hedge making.
3.	<i>Euonymus japonicus</i>	Privet or Japanese spindle	Celastraceae	Medium sized shrub, used for hedge making, as pot plant, foliage is used as cut stem.
4.	<i>Euphorbia cotinifolia</i>	Caribbean copper leaf	Euphorbiaceae	Fast growing shrub with reddish foliage, suitable as pot plant, shrubby and specimen
5.	<i>Excoecaria bicolor</i>	Chinese croton	Euphorbiaceae	Attractive leaves, red and green on opposite sides of leaf blade, good shrub for pots.
6.	<i>Ficus benjamina</i>	Weeping fig	Moraceae	Shrub with dark green leaves suitable for hedges, specimen and topiary.
7.	<i>Justicia gendarussa</i>	Willow leaved Justicia	Acanthaceae	Medium shrub, good for making edges. Can also be grown under partial shade.
8.	<i>Lawsonia inermis</i>	Mehndi	Lythraceae	Medium sized fragrant, quick growing shrub, powder of its leaves used for decorating hand and feet.
9.	<i>Ligustrum ovalifolium</i>	Japanese Privet	Oleaceae	It is popular as a hedge plant can be propagated through cuttings.
10.	<i>Malpighia coccigera</i>	Miniature Holly	Malpighiaceae	Evergreen shrub with small dark green spiny leaves. Good for making topiary, hedges, edges and bonsai.
11.	<i>Melaleuca bracteata</i>	Golden bottle brush	Myrtaceae	Shrub of weeping habit, most suitable for topiary making, can be propagated from cuttings.
12.	<i>Phyllanthus myrtifolius</i>	Mouse tail plant	Phyllanthaceae	Evergreen shrub with small light green leaves borne on drooping branches, producing a dense crown. Suitable for hedges, edges and topiary.
13.	<i>Pseuderanthemum carruthersii</i>	False Eranthemum	Acanthaceae	Medium growing evergreen shrub, with green, dark purple and variegated leaves, suitable as pot plant
14.	<i>Vitex negundo</i>	Nirgundi	Verbenaceae	Tall shrub, silvery leaves. Suitable for saline, alkaline soil, drought resistant.
15.	<i>Volkmeria inermis</i> <i>Clerodendrum inermi</i>	Forest Jasmine	Verbenaceae	It is evergreen shrub, good for hedge making, can be trained for topiary making. Propagated from cuttings and is drought resistant.

IDENTIFICATION OF ORNAMENTAL CLIMBERS

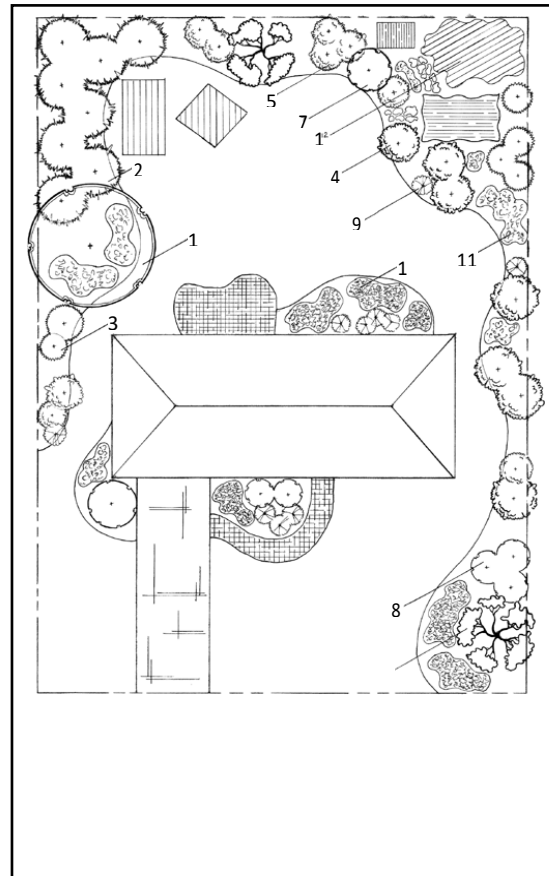
S. No.	Botanical Name	Common Name	Family	Flower colour and flowering time	Identifying characters
1.	<i>Allamanda cathartica</i>	Allamanda	Apocynaceae	Yellow, May-September	Light green foliage with narrow pointed leaves arranged in whorl of four. It can be grown as garden shrub or as climber.
2.	<i>Antigonon leptopus</i>	Coral Vine	Polygonaceae	Rose-pink, July-October	Deciduous quick growing climber, good for trellis and cascading
3.	<i>Aristolochia elegans</i>	Duck flower	Aristolochiaceae	June-September	Deciduous quick growing climber, good for trellis and cascading
4.	<i>Bauhinia vahlii</i>	Maljhan, Climbing bauhinia	Caesalpiniaceae	Creamy-white, May-June	Large, evergreen climber/ rambler, good for growing in foothills in drought prone areas.
5.	<i>Beaumontia grandiflora</i>	Nepal trumpet creeper	Apocynaceae	White, January-April	Evergreen quick growing heavy climber with shining coarse textured foliage
6.	<i>Bougainvillea</i> spp	Bougainvillea	Nyctaginaceae	Pink, magenta, white, orange, Throughout year	Evergreen to semi-deciduous climber usually pruned for restricting growth. It is valued for coloured bracts
7.	<i>Clerodendrum splendens</i>	Flaming glory bower	Lamiaceae/ Verbenaceae	Red, January-April	Large evergreen climber with coarse textured dark green foliage.
8.	<i>C. thomsonae</i>	Bleeding Heart	Lamiaceae	White bracts with red flowers, Jan- April	Evergreen climber dark green foliage and suitable for pots.
9.	<i>Clitoria ternatea</i>	Asian pigeon wings/ Butterfly pea	Fabaceae	Blue, white November-March	It is an annual climber, slow growing, can be grown as a pot climber
10.	<i>Combretum indicum/ Quisqualis indica</i>	Rangoon creeper/ Jhumka bel	Combretaceae	Reddish pink, Round the year	Beautiful creeper with moderately scented flowers. Used on long pillars, arches and trellis.
11.	<i>Dolichandra unguicati/ Bignonia unguicati</i>	Cat's claw	Bignoniaceae	Yellow, March-July	Evergreen light climber and have ability to climb over bare walls and pillars, emerging leaves purple-red. Good for making topiary.
12.	<i>Ficus repens</i>	Creeping fig/ Chipku bel	Moraceae	-	Evergreen climber and climbs with help of root exudates on walls, dead trees etc. and cover the wall. Best for growing in shady situations
13.	<i>Hiptage benghalensis</i>	Madhavi lata	Malpighiaceae	Creamy-white, February-June	Heavy woody semi-deciduous climber with shining foliage, emerging orange-red and red purple in autumn and have fragrant flowers.
14.	<i>Ipomoea cairica</i>	Railway creeper	Convolvulaceae	Purple, Throughout year	Evergreen quick growing climber.

15.	<i>Ipomoea learii</i>	Morning glory	-do-	Scarlet-pink, blue, June-September	Annual climber and usually grow in wild as weed.
16.	<i>I. quamoclit</i>	Cypress vine	-do-	Red, Oct-March	Annual climber with fine textured dark green leaves like fern
17.	<i>Jasminum auriculatum</i>	Juhi	Oleaceae	White, April-July	Evergreen climber with fragrant flowers.
18.	<i>J. grandiflorum</i>	Chameli/ Spanish jasmine	-do-	White, March-October	Evergreen climber with dark green fine textured foliage and fragrant flowers.
19.	<i>Lonicera japonica</i>	Honeysuckle	Caprifoliaceae	Creamy-white, Throughout year	Evergreen heavy quick growing creeping plant with fragrant flowers.
20.	<i>Mansoa alliacea/ Adenocalymma alliacium</i>	Garlic Vine	Bignoniaceae	Mauve-purple, March-June	Hardy climber with shining leaves which produce garlic like smell on rubbing. Suitable for pergolas and arches.
21.	<i>Pandorea jasminoides</i>	Australian bower plant	Bignoniaceae	Reddish pink, April-Nov.	Light climber with shining green foliage
22.	<i>Pyrostegia venusta</i>	Golden shower	Bignoniaceae	Orange, February-April	Heavy climber with drooping branches.
23.	<i>Passiflora caerulea</i>	Blue Passion flower	Passifloraceae	White with blue filament, Sept-Nov	Flowers look like clock/ watch, planted on arches and entrances.
24.	<i>Passiflora coccinea</i>	Red passion flower	Passifloraceae	Red, August-November	Tropical climber bears showy scarlet red flowers, suitable for sunny and high humidity.
25.	<i>Petrea volublis</i>	Purple wreath	Verbenaceae	Spring, purple	Creeper with woody stem with drooping long racemes of star like flowers.
26.	<i>Rosa sp.</i>	Climbing rose	Rosaceae	Many colours, Feb-July	Many varieties of climbing rose are suitable for growing in arches, pergolas and trellises.
27.	<i>Rosa banksiana</i>	Banksian Rose	Rosaceae	Creamish white, white, March- April	Trailing type of species which produces small flowers in bunches.
28.	<i>Solanum jasminoides</i>	Potato vine/ Jasmine nightshade	Solanaceae	White, bluish white Sep- Feb	A slender twining shrub suitable for medium to high elevations.
29.	<i>Tecoma grandiflora/ Campsis grandiflora</i>	Trumpet flower	Bignoniaceae	Orange, March-October	Deciduous climber and have ability to climb over walls. Bear glossy dark green leaves.
30.	<i>Tecomera capensis</i>	Cape Honeysuckle	Bignoniaceae	Orange, throughout the year	Evergreen climber, it can be trimmed to give shapes.
31.	<i>Thunbergia grandiflora</i>	Bengal Clockvine	Acanthaceae	Sky blue, Feb-Mar	Dense green foliage, heart shaped. It can cover walls, trees
32.	<i>T. mysorensis</i>	Mysore trumpet vine	Acanthaceae	Orange, red, yellow, Jan- March	Flowers are borne in pendulous racemes, suitable for arches, pergolas and trellis.
33.	<i>Trachelospermum jasminoides</i>	Star jasmine	Apocynaceae	April-June, white	Evergreen climber, suitable for growing in shady situation and bears fragrant flowers.
34.	<i>Wisteria sinensis</i>	Chinese Wisteria	Fabaceae	Purple, white, February- March,	It is a winter deciduous creeper which can be trained over pergolas, fences and trellis.
35.	<i>Tarlmounia elliptica</i>	Curtain creeper	Asteraceae	Foliage shrub with white flowers	It is evergreen climber with drooping branches. Good for covering boundary wall and verandas.

DESIGNING OF HOME GARDENS



Base Map and Initial Site Analysis



Bubble diagram

MUGHAL GARDENS

- Mughal gardens are synonymous of formal style of gardening.
- Gardens are formal in style i.e., symmetrically designed in rectangular or square plots.
- The garden area is divided into four plots by water channels.
- The four plots are planted with trees, shrubs, etc.
- The running water provides coolness and freshness to the garden.
- Reflection of sky and trees provide unique beauty to the eye.
- The axis is straight and central and sometimes represented by trees line.
- The water pool created in the centre with over flowing water serves as central specimen.
- Fountains, cascades are linked to central pool to create scenic beauty.
- The presence of seven, eight or twelve terraces in the garden symbolized plants, paradise and the zodiac, respectively.
- Baradari, a canopied building with twelve open doors on all sides, is another feature of some of the Mughal gardens.



Plants in Mughal gardens: Cypress trees due to its evergreen nature have been a symbol of eternity for Mughals. The traditional planting of alternate cypress and flowering trees along the waterways represented immortality and the renewal of life, respectively. White kachnar (*Bauhinia alba*) represented the youth of life. In Kashmir, the Mughals planted chenar, white poplar, cypress, apple, peach, plum, sour or sweet cherries, quince, pomegranate and fig in the plains. The gardens were planted with fruit trees like mango, grape, fig, orange, citron, peach and plum. Fragrant flowering shrubs like harsinghar,

queen of the night, jasmine, rose and screw pine were commonly planted. Herbaceous plants like narcissus, daffodils, iris, carnation, hollyhock, larkspur, stock, sunflower, amaranthus and cockscomb were dominant.

ENGLISH GARDENS

- History of English garden dates back to 14th century.
- Famous architects Repton and Capability Brown advocated the concept that English gardens should merge with countryside without fences, hedges, walls, etc.
- In 16th century flower beds, topiaries and terrace gardens were introduced into English gardens.
- During mid of 18th century, the gardens were laid out more emphasis on architectural features, like curved paths, informal grouping of trees, rivulets, artificial waterfalls, etc.
- English gardens introduced shrubberies, flower beds in various shaped.
- The main features of English garden are lawn, terrace garden, paths and drives, pavilions, herbaceous borders, shrubby border, topiaries, trees and climbers, orchidarium, succulents, rosaries, flower beds, carpet beddings, bulbous plants, waterfall, stream, water garden, rock garden, glasshouse, etc.
- Plants used in English gardens are carnations, rosemary, lavender, thyme, lilies, Conifers mixed with broad-leaved deciduous trees, apple, pear, peach, mulberry and cherry trees



JAPANESE GARDENS

Both the Persian and Japanese designs were based on their respective ideas of heaven. The most important teaching of the Japanese garden is possibly that “unless a garden has an air of peace it’s not worth a place to visit, it should be a place where the mind finds rest and relaxation. A Japanese garden tries to capture natural scenery or to imitate a landscape. More emphasis is placed on natural elements such as a simple path, a group of rocks, stepping stones, streams, waterfalls, bridges, stone lantern etc. the three elements most important to achieve are water, stone and plants.

The Japanese gardens are further classified based on position, shape and purpose. The important types are



- 1. Hill garden:** This style in Japanese is known as *Tsukiyama-niwa* or *Tsukiyama-sansui*, meaning hills and water. Hill garden is made up of one or more hills designed with earth mounds and exposed weathered stones. The other features of this garden are water on the form of a stream or a pond or waterfalls or all the three with or without islands and also bridges, lantern, stones and selected trees. The important points in the garden are decorated with stones and selected trees. Untrimmed stones are placed over the walks. An island is generally a usual feature in hill garden.
 - 2. Flat garden:** As the name implies, *Hira-niwa* or flat gardens are laid out in flat ground without hills or ponds. Flat gardens are supposed to represent a mountain valley or meadow land. A flat garden is not necessarily flat, since it stimulates a mountain valley, low rounded hills designed with the help of stones or earth mounds or both will look quite appropriate in a flat garden.
 - 3. Tea garden:** The tea garden is laid out based on certain principles and customs of the tea ceremony and hence needs a considerable space for its designing. To protect tea house from the noise of the outer world, the tea garden is divided into an outer tea garden (*soto-roji*) and inner tea garden (*uchi-roji*).
- a) **Outer tea garden:** It is comparatively a narrow area with a waiting place where the guests are supposed to wait until the master of the house appears to welcome them. This waiting place has a water basin for the convenience of the guests who wash their hands and a stone lantern for illumination. A stone path, usually of stepping stones that leads to inner

garden is also there.

b) Inner tea garden: It contains the tea house. The tea house of the classical time was nothing but a small straw hut with an outside waiting place. The entire path to the tea house is paved with stones or studded with stepping stones. The entrance to the tea house is through a low door so that the guests have to enter in a bending posture, simulating respect and humility.

4. Passage garden: The passage gardens, *Roji-niwa* are those which are laid in narrow passage. The common features of a passage garden are few key rocks, slabs of stones and only a couple of type of plants. Bushy shrubs and trees are unsuitable in a passage garden; instead, plants with open form and slender shapes are selected

5. Sand garden: It is the simplest style of gardening though not liked by many as it is totally devoid of plants. The most famous sand garden exists in Kyoto and is known as Ryoanji garden. The main feature of this type of garden is to arrange few vertical and prostrate stones in group of 2 or 3 and fill in gap between the stones with fine white gravel. The gravel is raked in patterns to resemble ocean waves.

Plants found in Japanese gardens:







i) Trees:

- a) Evergreen: Pines, species of *Abies*. *Cryptomeria japonica*, *Podocarpus macrocarpa* and *Juniperus chinensis*.
- b) Deciduous: Maples (*Acer* sp.), Poplars (*Populus* sp.) Mulberry (*Morus alba*) and Weeping willow (*Salix babylonica*)
- c) Flowering trees: *Prunus* sp., Rhododendron, Magnolia

ii) Shrubs: *Azalea* sp., *Camellia japonica*, *Aucuba japonica*, *Gardenia florida*

iii) Herbaceous plants: Chrysanthemum, aster, carnation, and lilies

iv) Climbers: Clematis, *Lonicera japonica*, *Ipomoea purpurea*, *Wisteria sinensis*.

	
<p style="text-align: center;">HILL GARDEN</p> 	<p style="text-align: center;">FLAT GARDEN</p> 
<p style="text-align: center;">COTTAGE GARDEN</p> 	<p style="text-align: center;">SAND GARDEN</p> 
<p style="text-align: center;">TEA GARDEN</p>	<p style="text-align: center;">PASSAGE GARDEN</p>