COLOUR AND LIGHTINING
UNIT 1

CONCEPT OF COLOUR:-

Colour is one of the most fundamental and influential aspects of interior design. Colour selection is a major factor in determining the success or failure of a decorative scheme. The carefully considered use of colour can unify furnishings and finishes to produce a cohesive and pleasing result. Colour plays a major role in defining the mood of a scheme and so the designer should allow the visual design concept (derived from the brief), together with consideration of the shape and proportions of a room, to guide and inform the selection of colours in order to achieve the desired effect.

SOURCES OF COLOUR:-

Color comes from light to be exact white light. The color comes from natural sunlight, which is commonly known as white light.

There are two sources of what we perceive as light:

- Natural light: day light/sunlight
- Artificial light: street light, torch, household bulbs etc...

The colors we attribute to objects however, find their source in the light that illuminates and reveals form and space. Without light color does not exist.

When white light falls on an opaque object, selective absorption occurs. The surface of the object absorbs certain wavelength of light and reflects others. Our eyes apprehend the color of the reflected light as the color of the object. Which wavelengths' or bands of light are absorbed and which are reflected as object color, is determined by the pigmentation of a surface. A red surface appears red because it absorbs most of the blue and green light falling on it and reflects the red part of the spectrum; similarly, a black surface absorbs the entire spectrum; a white surface reflects all of it. This distribution of color in light rays is reflected as a rainbow.

SIGNIFICANCE OF COLOUR IN THE INTERIORS AND EXTERIORS:-

We often oversee colors at the time of interior design. Color plays an essential role in our lives. It is a visual language understood throughout the world. When you try to communicate something through interior design,the best way to do it is through color. The interior design is highly dependent on the color scheme as it is the most

important factor of interior design. Colors, lights, and shades always surround us.

Each tone of color has a significant effect on our mood, has a specific meaning, and interlinks with our mind frame. Colors have the power to change your mood and mind. You choose the best combination of colors in your house that can bring together various emotions at your home like pleasant, calming, intimate, comfortable, dramatic and aggressive, etc.

It depends on our inbuilt characters and genetics on how we react to each color. Genetic programming lets us respond to various colors and appreciate them in the environment. The interior designer experts explore that colors can change your experience of the moment. The color has a substantial impact on the room atmosphere, and you should correctly choose the color before you start interior design. For instance, the bedroom requires peace, relaxation, and calm, so the color scheme should be accordingly. A living room needs to be energizing and exciting, and so on.

By tones, generally, there are two types of colors, namely warm and cold. Cool colors are those that bring the feelof calmness, quietness, relaxation, and peace within the

atmosphere. The colors like blue, purple, and green are considered cool-toned colors. Warm colors carry feelings of instant energy and give a boost to adrenaline. Red and orange are warm colors.

In addition to tone, all colors can change their character with the change in light and saturation. Thus, for interior design, you should have to pick a shade, not just a color. In general, the light colors feel airy, and they can make the room look bright and large. In contrast, the dark colors stylish, refined, and warm, and they create a feeling of intimacy in the room. The colors of your rooms in your house can be a direct expression of one'scharacter. Although many people may well not devote a considerable time pondering their bedroom color, it can affect us every day. The room in our home color is going to influence our emotional behavior and our thought processes.

DIMENSIONS OF COLOUR:-

The Three Dimensions of a Color

The main attributes that define a color in all its endlessvariations are hue, value, and chroma.

Dimension	Definition
Hue	Name of a color family
Value	Lightness or darkness of a color
Chroma	Strength or intensity of a color

HUE:-

It is the purest form of a color It is

the name of the color itself

Monochromatic is design using a single hue

For Example: Blue, Red, Yellow, Orange, Green, and Purple are hues.

All Hues Are Colors, Not All Colors Are Hues

While all the hues on the color wheel are also colors, some colors are not hues and are not included in thecolor wheel.

Think of brown for example. Brown is a color, but it does not appear on the color wheel because it’s not a hue. In fact, brown is a dull color under a hue. Depending on the

kind of brown, it could be a dull red, orange, or evenpurple.

Other hues of importance are:

- Neutrals: created by different amounts of reflectedlight
- Earth Tones: created by mixing opposite colors

VALUE:-

It is the degree of lightness or darkness of a color. It is

used to make objects look three dimensional.

White, black & gray are sometimes referred to as values without hue or intensity.

Black has value zero and pure white has value 10. The values in between are gradually lighter grays of values 2, 4, 6, and 8.

Example: when you add shades (dark values) and highlights or tints (light values) to a drawing to make it looks real, like it has mass and volume.

Tint = color mixed with white Tone=

color mixed with gray Shade = color

mixed with black

INTENSITY:-

It is the brightness or dullness of a colorIt

creates the illusion of depth

Intensity is also called as chroma or saturation

Chroma refers to the strength or intensity of a color. A high chroma color is pure from any presence of gray or white. For example, lemon yellow has a high chroma, while a banana yellow has lower chroma.

Colors with strong chroma are often referred to as bright or saturated; however, the term brightness is also used to describe the intensity of light and, therefore, indicates a combination of value (lightness) and chroma.

A color is most intense in its purest form (pure hue)

Intensity is the % of pure hue in a color & is measured as high or low to lower the intensity of a color

EFFECTS OF HUE VALUE AND INTENSITY:-

When the intensity of a color is adjusted, the value also changes. In the same way, when the value is adjusted,the intensity changes but to a lesser degree.

In other words, a lighter value of yellow is also a less intense version of the hue. And a less intense yellow

could be a lighter or darker version of the hue. I know – completely confusing.

So ultimately, although value and intensity are different, they are used interchangeably.

Value and intensity can be exploited together to create desired illusions in drawings and paintings.

Areas or objects that are receiving light will be lighter in value. Conversely, areas that are not in light, or in shadow, will be darker in value.

Areas or objects that are receiving light are typically more intense in hue, while areas or objects in shadow are sometimes less intense chromatically.

THE PHYSICIST'S THEORY OF COLOUR:-

The science of physics deals with colour as a property of light. Within the visible of spectrum of light, colour is determined by wavelength. Traditionally the spectrum is divided into seven separate bands. The first person to really define this was Newton. Starting at the longest wavelength with red, we proceed through the spectrum of orange, yellow, green, blue and violet to arrive at the shortest visible wavelengths. When these coloured lights are present in a light source in approximately equal quantities, they combine to produce white light – that is apparently colourless.

Colours in physics are denoted by their intensities and by their wavelength rather than by colour names of all colours. Red has therefore the longest wavelength and violet the shortest. The physics determines the quality of light radiation by spreading the wavelength present in light into a spectrum, and measures the intensities of the different wavelengths. By this method a clear and physically complete analysis of the quality of light radiation is obtained.

PSYCHOLOGY OF COLOUR: -

Colour psychology is the study of how certain colours impact human behavior. Different colours have different meanings, connotations, and psychological effects that vary across different cultures. Along with cultural differences, colour psychology is largely impacted by personal preference. Colour psychology involves the use of colour theory – the practical application of mixing and matching various hues to explore concepts like colour perception and the effect of colour combinations.

In the early twentieth century, Swiss psychiatrist Carl Jung studied the effects of color on the human mind. Jung eventually developed a form of color therapy that allowed his patients to express themselves with colors and images. Today, color psychology is primarily used in marketing and advertising.

4 Examples of Color Psychology:-

Red: The color red can increase a viewer's heart rate and blood pressure. This primary color is associated with passion and energy. Companies sometimes use the color red to express a sense of urgency.

Orange: The color orange is associated with playfulness. Along with other warm colors like the color yellow, orange may express enthusiasm and other strong positive emotions.

Blue: Different tints or shades of the color blue have different color associations. Light blue is typically associated with peace and gentleness while dark blue represents power, strength, and dependability.

Green: The color green is a secondary color associated with growth and nature. Green has a calming presence along with other cool colors like the color purple.

Emotional effects of colours:-

COLOUR SYSTEMS: -

The prang colour system: -

The system developed by David Brewster id probably the best known colour system and id often referred to as the prang colour system. The simplest way to understand colour relationships in this colour system is to study a colour wheel based on three primary colours – yellow, blue and red. These three hues are called primary in the prang colour system because they cannot be obtained by mixing other pigments, and also because the other colours are obtained by mixing these three colours in varying proportions.

Prang has classified the colour into five sections 1) Primary colours 2) Secondary or Binary colours 3) Intermediate colours 4) Tertiary colours 5) Quaternary colours

Primary colours: -

The three colours Yellow, Red and Blue are the primary colours. All other colours are made by mixing one or more of these three colours in various proportions. These three are the basic or fundamental colours. Y-Yellow, R-Red, B-Blue.

Secondary or Binary colours:-

When two primary colours are mixed in equal proportion a secondary or binary colour results. These are: Red + Yellow = Orange Yellow + Blue = Green Blue + Red = Purple or Violet Three primary and three secondary colours are known as “Six standard colours”. In order to make secondary colors you should mix the primary ones. By mixing red with yellow we get orange, and by mixing red with blue you get a violet color. Blue together with yellow turns into green.

Intermediate colours:-
When one primary and a neighboring secondary colours are mixed, an intermediate colour results. These are: Yellow + Green = Yellow Green Blue + Green = Blue Green Blue + Violet = Blue Violet Red + Violet = Red Violet Red + Orange = Red Orange Yellow + Orange = Yellow Orange. The Primary, secondary and intermediate colours constitute the outer circle in the Prang Colour chart.

Tertiary Colours:-
When two secondary or binary colours are mixed, a tertiary colour results. These are: Green + Orange = Tertiary Yellow Green + Violet = Tertiary Blue Orange + Violet = Tertiary Red

Quaternary Colours:-
A mixture of two tertiary colours results in Quaternary colour. These are: Tertiary yellow + Tertiary blue = Quaternary green Tertiary blue + Tertiary red = Quaternary violet Tertiary yellow + Tertiary red = Quaternary orange In the Prang Colour chart the colours are arranged in a circle. The yellow colour is at the top centre and violet falls directly opposite to it. Blue lies on the right side and Red colour on the left side of the colour wheel.

THE MUNSELL COLOUR SYSTEM:-

The Munsell system was developed by Albert H. Munsell , an American artist and researcher. The system consists of three independent properties of color which can be represented cylindrically in three dimensions as an irregular color solid:

- Hue, measured by degrees around horizontal circles
- Chroma, measured radically outward from the neutral (gray) vertical axis
- Value, measured vertically on the core cylinder from 0 (black) to 10 (white)

The Munsell Color Order System, commonly called the Munsell Color System, is a colour space for describing colour of surfaces. It uses an irregular 3-dimensional color space. The dimensions are hue, represented as a circle, value along the central axis, and chroma represented as distance from the axis. Changes in each dimension are intended to be perceptually equal within the dimension, so that an increase of chroma from 3 to 4 is perceived as the same difference as an increase from 7 to 8. As a result, the color space is not geometrically regular, unlike most color systems developed previously.

The Munsell system has five primary hues: Purple, Blue, Green, Yellow, and Red, and five secondary hues, equidistant between the primaries.

A color is described using the notation H V/C, for Hue, Value, and Chroma. Hue is notated with a number and the letter(s) representing the primary or secondary color being represented, while value and chroma are notated purely with numbers. For example, a vivid orange may be 5RY 7/12. Numbers for hue range from 0 to 10 at each primary or secondary color, and increase in the direction from red to yellow. The primary colors use the initial letter of the color name, while the secondary colors use the initial letters of the two primary colors nearest, thus RY for orange. The letter N is used for pure grays (including black and white). Value is measured from 0 (pure black) to 10 (pure white), though a value of slightly higher than 9 is the highest practically obtainable. Chroma is measured in equal perceptual steps. In the original Munsell system, 10 was the highest chroma possible.

COLOUR HARMONIES:-

There are different methods of getting harmonic color combinations. Let's discuss harmonic color schemes and examples of their application. These color schemes are usually called the basic ones.

MONOCHROMATIC COLOUR SCHEME:- This colour scheme can be produced from one colour. Several values and intensities of the same colour may be used. Neutral colours like black and white may be added. This kind of colour scheme is quiet, restful and makes a good background for accessories. For example, Pink, Maroon and Red may be combined in producing Monochromatic colour scheme. This colour scheme is known as one hue or one mode harmony.

ANALOGOUS COLOUR SCHEME:-When the colours which are neighboring or adjacent in the Prang Colour Chart are used, it is known as Analogous Colour Scheme. Adjacent colours are harmonious, because they have one hue in common. For example, Yellow Green, Green and Blue Green or Red Purple, Blue Purple and Purple etc. In this scheme we use colors that are placed near each other in the color spectrum. This kind of scheme is often used for the creation of peaceful and comfortable designs. An analogous color scheme is often met in nature.

DIRECT COMPLEMENTARY COLOUR SCHEME:-This colour scheme can be obtained by mixing the colours which are directly opposite to each other in the Prang colour wheel. For example, Yellow and Purple, Red and Green, Blue and Orange etc.

DOUBLE COMPLEMENTARY COLOUR SCHEME:-When two neighboring colours and their complementary are used together, they form double complementary colour scheme. For example, Yellow and Yellow Orange to Purple and Blue Purple or Green and Yellow Green to Red and Red Purple. In this colour scheme, one hue should be used more.

SPLIT COMPLEMENTARY COLOR SCHEME: - This scheme is the variation of complementary color scheme. It uses a color and two colors adjacent to its complementary. Only right or left colors from a complementary color are used. This provides high contrast without the strong tension of the complementary scheme. The split complementary scheme is harder to balance than monochromatic and analogous color scheme. One warm concentrated color and a number of cold colors are usually used.

TRIADIC COLOR SCHEME: - Three colors that are equally placed in a color spectrum are used in this scheme. This scheme gives a strong visual contrast with harmony and color richness. Colors in this scheme are more balanced than in a complementary color scheme. As a rule one color in a composition is chosen as basic.