PRINCIPLES OF ART AND ARCHITECTURE
CHAPTER 1: ELEMENTS AND PRINCIPLES OF ART AND ARCHITECTURE

The elements and principles of design are the building blocks used to create a work of art.

THE ELEMENTS OF DESIGN

SPACE

Space is the area provided for a particular purpose. It may have two dimensions (length and width) such as a floor, or it may have three dimensions (length, width, and height), such as a room or dwelling. Space is affected by the number and size of objects in it.

LINE

Line is the visual direction of a design. It can be used to emphasize a pleasing element or disguise an undesirable one.

Different types of lines have different effects on design.

Vertical lines lead the eye up, adding height, formality, and strength to a design.

Can be seen in:
- Tall furniture
- Columns
- Pillars
- Striped wallpaper
- Long narrow draperies

Horizontal lines lead the eye to the left or right, suggesting informality and restfulness.

Can be seen in:
- Long, low roofs
- Long, low furniture pieces such as sofas and chests

Diagonal lines suggest action, movement and excitement. Can be seen in:
Staircases

Cathedral ceilings

Gable Roofs

Use of diagonal lines

Curved lines add a softening, graceful effect to designs.

All lines have direction - Horizontal, Vertical or Oblique. Horizontal suggests calmness, stability and tranquility. Vertical gives a feeling of balance, formality and alertness. Oblique suggests movement and action.

**SHAPE**

A shape is a self-contained defined area of geometric or organic form. A positive shape in a space automatically creates a negative shape.
Shapes can be perfect or imperfect.

**FORM**

Form is the outlined edges of a three-dimensional object. It has length, width, and depth (or height) as well as volume and mass.

**SIZE**

Size is simply the relationship of the area occupied by one shape to that of another.

**TEXTURE**

Texture is the surface quality of a shape - rough, smooth, soft hard glossy etc. Texture can be physical (tactile) or visual.

**COLOUR**

Also called Hue. Red, green and blue-violet are examples of hues.

**VALUE**

Value is the lightness or darkness of a color. Value is also called Tone.
THE PRINCIPLES OF DESIGN

BALANCE
Balance in design is similar to balance in physics

A large shape close to the center can be balanced by a small shape close to the edge. A large light toned shape will be balanced by a small dark toned shape (the darker the shape the heavier it appears to be).

Balance can be symmetrical or assymmetrical.

RHYTHM
Leads the eye from one point to another, creates motion. Types of Rhythm are:

- Rhythm by Repetition
- Rhythm by Gradation
- Rhythm by Radiation
- Rhythm by Opposition
- Rhythm by Transition

REPETITION AND VARIATION
Repetition with variation is interesting, without variation repetition can become monotonous.
The five squares above are all the same. They can be taken in and understood with a single glance.

When variation is introduced, the five squares, although similar, are much more interesting to look at. They can no longer be absorbed properly with a single glance. The individual character of each square needs to be considered.

If you wish to create interest, any repeating element should include a degree of variation.

**SCALE**

Scale relates to the size of a design in relation to the height and width of the area in which it is placed. Relates to the actual and relative size and visual weight of the design and its components.

**PROPORTION**

Proportion relates to the parts of the object and how one part relates to another. Effective Ratios are 2:3, 3:5, 5:8, 4:7, etc. For a given space we do not want any object to be too big, or too small, or too tall or the like. It has to be in right proportion and scale. Creative use of color, texture, pattern, and other arrangements can create illusions of properly proportioned space.

**EMPHASIS**

It gives a space interest, counteracting confusion and monotony. Dominance can be applied to one or more of the elements to give emphasis. This can be done by:

Arrangement of furniture around a focal point.

Use of color, texture, or pattern.

Placement of accessories.

Use of lighting.
HARMONY
Harmony is the visually satisfying effect of combining similar, related elements. Is achieved when unity and contrast are effectively combined.

UNITY
Relating the design elements to the idea being expressed reinforces the principal of unity. eg. a painting with an active aggressive subject would work better with a dominant oblique direction, course, rough texture, angular lines etc. whereas a quiet passive subject would benefit from horizontal lines, soft texture and less tonal contrast.

Unity also refers to the visual linking of various elements of the work.
CONTRAST
Contrast is the juxtaposition of opposing elements eg. Opposite colours - red / green, blue / orange etc. Contrast in tone or value - light / dark. Contrast in direction - horizontal / vertical.

The major contrast should be located at the center of interest. Too much contrast scattered throughout can destroy unity and make a space look cluttered. Unless a feeling of chaos and confusion are what you are seeking, it is a good idea to carefully consider where to place your areas of maximum contrast.
COLOUR THEORY

DESCRIBING COLORS

A color is described in three ways: by its name, how pure or desaturated it is, and its value or lightness. Although pink, crimson, and brick are all variations of the color red, each hue is distinct and differentiated by its chroma, saturation, intensity, and value.

Chroma, intensity, saturation and luminance/value are inter-related terms and have to do with the description of a color.

Chroma: How pure a hue is in relation to gray.
Saturation: The degree of purity of a hue.
Intensity: The brightness or dullness of a hue.
One may lower the intensity by adding white or black.
Luminance / Value: A measure of the amount of light reflected from a hue. Those hues with a high content of white have a higher luminance or value.
Shade and tint are terms that refer to a variation of a hue.
Shade: A hue produced by the addition of black.

Tint: A hue produced by the addition of white.

The 12 part colour wheel below is based on the three primary colours (Red, Yellow and Blue) placed evenly around a circle.

Between the three primaries are the secondary colours (Green, Orange and Violet) which are mixtures of the two primaries they sit between.

The tertiary colours fall between each primary and secondary. Between yellow and orange, for example, is yellow orange, between blue and violet is blue violet and so on.

All these colours around the outside of the colour wheel are called saturated colours. They contain no black, no white and none of their complimentary or opposite colour.

Compound colours are colours containing a mixture of the three primaries. All the browns, khakis and earth colours are compound colours.
Analogous colors are groups of three colors that are next to each other on the color wheel, with one being the dominant color, which tends to be a primary or secondary color, and a tertiary. Red, orange, and red-orange are examples.

Supplementary colours are colours that are next to each other on the colour wheel. They are basically the colours that are between two prime colours not including the second prime colour. Example, Red - Red/Orange - Orange - Yellow/Orange are all supplementary to each other.

Complimentary colours are those opposite each other on a colour wheel such as yellow-violet.

Triad colour schemes or relationship mean three hues equally positioned on a color wheel.

Split-Complementary Relationship One hue plus two others equally spaced from its complement.

Monochromatic Relationship Colors that are shade or tint variations of the same hue.

**SUBTRACTIVE COLOR**

When we mix colors using paint, or through the printing process, we are using the subtractive color method. Subtractive color mixing means that one begins with white and ends with black; as one adds color, the result gets darker and tends to black.
The CMYK color system is the color system used for printing.

Those colors used in painting—an example of the subtractive color method.

**ADDITIVE COLOR.**

If we are working on a computer, the colors we see on the screen are created with light using the additive color method. Additive color mixing begins with black and ends with white; as more color is added, the result is lighter and tends to white.

The RGB colors are light primaries and colors are created with light.
Percentages of red, green, & blue light are used to generate color on a computer screen.

**ITTEN'S COLOR CONTRASTS**

Johannes Itten was one of the first people to define and identify strategies for successful color combinations. Through his research he devised seven methodologies for coordinating colors utilizing the hue's contrasting properties. These contrasts add other variations with respect to the intensity of the respective hues; i. e. contrasts may be obtained due to light, moderate, or dark value.

**THE CONTRAST OF SATURATION**

The contrast is formed by the juxtaposition of light and dark values and their relative saturation.

**THE CONTRAST OF LIGHT AND DARK**
The contrast is formed by the juxtaposition of light and dark values. This could be a monochromatic composition.

**THE CONTRAST OF EXTENSION**

Also known as the Contrast of Proportion. The contrast is formed by assigning proportional field sizes in relation to the visual weight of a color.

**THE CONTRAST OF COMPLEMENTS**

The contrast is formed by the juxtaposition of color wheel or perceptual opposites.
SIMULTANEOUS CONTRAST

The contrast is formed when the boundaries between colors perceptually vibrate. Some interesting illusions are accomplished with this contrast.

THE CONTRAST OF HUE

The contrast is formed by the juxtaposition of different hues. The greater the distance between hues on a color wheel, the greater the contrast.
THE CONTRAST OF HUE - PRIMARIES

The contrast is formed by the juxtaposition of primary hues.

THE CONTRAST OF WARM AND COOL

The contrast is formed by the juxtaposition of hues considered 'warm' or 'cool.'
Previous Gate Questions:

Q. On the color wheel, the combination of ‘Violet-Yellow’ or ‘Orange-Blue’ are best described as [Gate 2009]
(a) Complementary (b) Supplementary (c) Analogous (d) Monochromatic **Ans: A**

Q. Primary colors of natural light are [Gate 2010]
(a) Red, Blue, Yellow (b) Red, Green, Blue
(c) Red, Violet, Yellow (d) Red, Green, Yellow **Ans: A**

Q. Concept of ‘Serial Vision’ has been applied to the approach layout of [Gate 2010]
(a) Victoria Memorial Complex, Kolkata (b) UmaidBhawan Palace, Jodhpur
(c) VidhanSoudha Precinct, Bangalore (d) RashtrapatiBhawan Complex, Delhi **Ans: D**

Q. Purity of color is described by [Gate 2011]
(a) Hue (b) Value (c) Chroma (d) Tone **Ans: C**

Q. Gestalt’s Laws of visual perception DO NOT relate to [Gate 2011]
(a) Aesthetics of form are a function of Golden section
(b) Things are perceived as a whole
(c) Whole is greater than the sum total of its parts
(d) Elements with continuity are perceived together **Ans: A**

Q. **Ans: B** [Gate 2011]

Arrange the following sense of enclosures in a hierarchy of decreasing order

(A) S>Q>U>P>T>R  
(C) P>Q>R>S>T>U  
(B) U>S>Q>R>P>T  
(D) T>P>S>Q>U>R
Q. The hue at the center of the Munsell Color Solid is (a) Black (b) Grey (c) Sepia (d) White Ans: B

Q. The term ‘Zeitgist’, used in contemporary architecture, refers to (a) Iconicity (b) Spirit of Times (c) Kinesthetics (d) Semantic Associations Ans: B

Q. A combination of colors forming an equilateral triangle in a Color Wheel is called (a) Analogous Scheme (b) Triad Scheme (c) Split Complementary Scheme (d) Double Complementary Scheme Ans: B

Q. Saturation level of a color represents (a) Distribution (b) Brilliance (c) Darkness (d) Warmth Ans: B

Q. In CMYK colour model, ‘K’ represents the colour (a) White (b) Black (c) Blue (d) Green Ans: B