

C.G.A. I.A. 2 Q&A

***1. What is image? Explain any 5 image formats.**

Image:-

An image is a virtual representation of something. It is a picture that has been created or copied and stored in an electronic form.

Different format of Images:-

1)JPEG:- It stands for Joint Photographic experts group. JPEG format is designed only to store still images. JPEG files are images that have been compressed to store a lot of information in a small size file.

2)GIF:- GIF stands for Graphic Interchange Format. GIF format supports storage of both still images and simple animation. This format compresses images but is different from JPEG, the compression is lossless but the file cannot be made as small as JPEG.

3)SVG:- SVG is Scalable Vector Graphic. Scalability means the file can be viewed on a computer display of any size and resolution, whether the small screen of a smartphone or a large wide screen display in PC.

4) TIFF:- TIFF stands for Tagged Image File Format. TIFF images are uncompressed and thus contain a lot of detail image data.

5)PNG:- [Portable Network Graphic] It allows for a full range of colors and better compression. As compared to JPEG it creates larger file.

***2. Define Animation and explain any 5 Principles of animation.**

Animation:-

It is defined as the act of making something alive, it is an art o creating, viewing & moving images with the use of computer.

An animation is nothing but the movement of serial of still images created on timely manner and displayed in rapid succession with certain speed.

This creates an illusion of movement because of persistance of vision.

Principles:-

1)Squash & Stretch

This principle is often demonstrated with a bouncing ball, the ball appears stretch when it is falling and squash when it hits the ground.

By squashing and stretching the ball, an animator gives more realistic feel.

2)**Anticipation**

It is the preparation for the main action.

For example, before you throw the ball you must first swing your arm backwards. The backward motion is the anticipation.

3)**Staging**

Influence by theatrical principle, staging helps establish mood, create focus and clarify what is happening in the scene.

4)**slow-in and Slow-out**

In a physical world, object and human need to pickup momentum before they can reach full speed. Similarly it take time to decrease speed before something can coome to a complete stop.

5)**Appeal**

A character with appeal isn't always attractive. He or She can be an ugly or evil character with a certain level of charisma that it makes sense within the story.

6) Secondary Action

Secondary action creates interest and realism in animation. It should not be staged such that it can be noticed but still not overpower the main action.

3. Explain different types of Image compression.

Image:-

- An image is a virtual representation of something. It is a picture that has been created or Copied and stored in an electronic form.
- There are two types of Image Compression:-

a) Lossy image compression

- It reduces a file by permanently eliminating certain information, which is no longer in use.
- When uncompressed, the compressed part is no longer available only remaining part of an image is present.
- Decompression cannot retrieve the original data back.
- It is generally used for video & audio where loss in certain amount

of information will not be detected by most users.

- JPEG:- Joint Photographic Expert Group file is a type of lossy compression, which is commonly used for photograph, and to display images on web.
- Using JPEG compression, the creator can decide how much loss to introduce and make a trade off between filesize and image quality.

b) **Lossless Compression**

- It reduces the file size without eliminating any information from the original image.
- When uncompressed all original data can be recovered as it is.
- Decompression retrieves the original image back, All of the information is restored completely.
- It is generally used for text or spreadsheet files, where losing words or financial data could cause a problem.

***4. Explain color appearance.**

COLOR APPEARANCE:-

- Colorimetry allows us to precisely require and communicate color in device independent manner and chromatic adaptation allows us

to predict color matches across changes in illumination but these tools are still inadequate to define how color actually look like.

- A Color appearance Model provides mathematical formulae to transform Physical measurements of the stimulus and viewing environment into Correlates of perceptual attributes of color (eg. lightness, Chroma, hue, etc.).
- There are different parameters used for color appearance which are given as follows:- HUE - Brightness - Lightness - Colorfulness - Chroma - Saturation
- HUE: It is an Attribute of a visual sensation according to which an area appears to be similar to one of the perceived colors i.e. pure color: red, yellow, green, and blue, or to a combination of two of them.

Hue is a more technical definition of our color perception which can be used to communicate color ideas.

- Brightness: It is an Attribute of a visual sensation according to which an area appears to emit more or less light. It is referred to as the absolute level of the perception.
- Lightness: It is a representation of variation in the perception of a color or color space's brightness. It is referred to as relative brightness normalized for changes in the illumination and viewing

conditions.

Lightness defines a range from dark (0%) to fully illuminate (100%). Any original hue has the average lightness level of 50%.

Lightness is the range from fully shaded to fully tinted. We can lighten or darken a color by changing its lightness value

- Colorfulness: It is an attribute of a visual sensation according to which the perceived color of an area seems to be more or less chromatic (e. multiple color variations).
- Chroma: Chroma is a component of a color model. There's a blue yellow and a red-green chroma component.
- Saturation: Saturation is used to determine certain color and measured as percentage value. Saturation defines a range from pure color (100%) to gray (%) at a constant lightness level.

***5. Describe RGB color space**

Color:

- Color perception is naturally independent.
- The objective capacities of the color of a source object is alleged by a standard human observer that also can be measured.

- Various standard human observers are defined in the discipline of Colorimetry.
- According to standard model, the perceived color of a given spot can be reduced to a three-dimensional value.
- The three dimensions of color can be described as color of brightness, hue and purity or saturation.

Color Spaces:

- A range of colors that can be created by the primary colors of pigment and these colors then define a specific color space.
- It is a way to represent colors, usually used in relation to computers or graphics boards.
- Color includes levels of grey.

RGB Color model:

- The RGB color model is an additive color model in which red, green, and blue light are added together in various ways to reproduce a broad array of colors.
- The name of the model comes from the initials of the three additive primary colors, red, green, and blue.
- The main purpose of the RGB color model is for the sensing, representation, and display of images in electronic systems, such as

televisions and computers, though it has also been used in a conventional photography. Before the electronic age, the RGB color model already had a solid theory behind it, based on the human perception of colors.

- In the RGB color model, we use red, green, and blue as the three primary colors. We do not actually specify what wavelengths these primary colors correspond to, so this will be different for the different types of output media, for example, different monitors, films, videotapes, and slides.

6. Write a short note on Chromatic adaptation?

The surroundings in which viewer objects and images has a larger effect on how we perceive those objects/ the range of viewing environment (i.e., by mean of light) is very large, from sunlight too moonlight or from candle light to luminous light.

A human visual system accommodates these change in the environment through a process called as adaptation.

There are three types of adaptation: -

- Light adaptation
- Dark adaptation

● Chromatic adaptation

- Light Adaptation:

1) It refers to the change occurs when we move from very dark to very light environment i.e., dark -> light

2) When this happens we are dazzled at first by the light but soon we adapt to the new situation and then we begin to distinguish objects in our environment.

- Dark Adaptation:

1) It refers to the change occurs when we move from very light to very dark environment i.e., light -> dark

2) When this happens we see very little at first but after some time the details of an objects starts appearing in front of us.

3) Time needed to adapt objects in dark adaptation is much longer than that of light adaptation.

- Chromatic Adaptation:

1) It refers to the human's ability to adjust and largely ignore differences in the color of the illumination. Although, we are able to largely ignore the changes in the viewing environment but we are unable to do it completely. For example, color appears much more colorful in a sunny day as compare to a cloudy day.

2) Chromatic adaptation is the ability of the human visual system to discount the color of a light source and to approximately preserve the appearance of an object.

For example, a white piece of paper appears to be white when viewed under sky light and tungsten light (light under a light bulb). However, the measured tri-stimulus values are quite different for the two viewing conditions

3) Chromatic adaptation is the biological equivalent of a white balancing operation that is available on most of the modern cameras. It allows white objects to appear white for a large number of lighting conditions.

7. Write a short note on Image Processing.

Image:- An image is a virtual representation of something. It is a picture that has been created or copied and stored in an electronic form.

Image Processing:-

- Image processing is a technique to improve quality of an image by performing mathematical operations on an image.
- To improve the quality of an image, image enhancement technique are used.

- Image processing is a method of converting an image into digital form and perform some operation on it in order to get enhanced image or to extract some useful information from it.
- Image processing basically includes the following three steps:-
 - i. Input: Importing the image by optical scanner or by digital photography.
 - ii. Processing: Analysing and manipulating the image which includes data compression, image enhancement and spotting patterns that are not properly visible to human eyes like satellite photographs.
 - iii. Output:- Output is the last stage in which result can be altered image or report that is based on image analysis.
- There are two types of Image Processing
 1. Analog: This technique of Image processing can be used for hardcopies and printout.
 2. digital: This technique of Image processing can help in manipulation of the digital image.

8. Explain Grassmann's Law.

