IT6501 GRAPHICS AND MULTIMEDIA

UNIT 1
2D PRIMITIVES

Basic − Line − Curve and ellipse drawing algorithms − Examples – Applications – Attributes − Two- Dimensional geometric transformations − Two-Dimensional clipping and viewing – Input techniques.

COURSE OBJECTIVE

Develop an understanding and awareness of how issues such as content, information architecture, motion, sound, design, and technology merge to form effective and compelling interactive experiences for a wide range of audiences and end users

PART A

1. Define Computer Graphics.

The use of a computer to produce and manipulate pictorial images on a video screen, as in animation techniques or the production of audio visual aids.

2. Explain any 3 uses of computer graphics applications.

Computer Aided Design, Entertainment, Education and training.

3. What are the advantages of DDA algorithm?

- The DDA algorithm is a faster method for calculating pixel positions
- It eliminates the multiplication

4. What are the disadvantages of DDA algorithm?

- The accumulation of roundoff error in successive additions of the floating-point increment, however, can cause the calculated pixel positions to drift away from the true line path for long line segments.
- The rounding operations and floating-point arithmetic in procedure **lineDDA** are still time-consuming

5. Define Scan-line Polygon fill algorithm.

For each scan line crossing a polygon, the area-fill algorithm locates the intersection points of the scan line with the polygon edges. These intersection points are then sorted from left to right, and the corresponding frame-buffer positions between each intersection pair are set to the specified fill color.

6. What are Inside-Outside tests?

- Jordan Curve Theorem
- Even-odd rule
- Nonzero winding number rule

7. Define Boundary-Fill algorithm.

Area filling starts at a point inside a region and paint the interior outward toward the boundary. If the boundary is specified in a single color, the fill algorithm proceeds outward pixel by pixel until the boundary color is encountered. This method, called the boundary-till algorithm

8. Define Flood-Fill algorithm.

Sometimes we want to fill in (or recolor) an area that is not defined within a single color boundary. We can paint such areas by replacing a specified interior color instead of searching for a boundary color value. This approach is called a flood-fill algorithm.

9. Define attribute parameter. Give examples.

Parameter that affects the way a primitive is to be displayed is referred to as an attribute parameter Some attribute parameters, such as color and size, determine the fundamental characteristics of a primitive.

10. What is the command used to draw the thickness of lines.

SetLineWidthScaleFactor(lw)

11. What are the three types of thick lines?

(a) butt caps, (b) mund caps, and (c) projecting square caps

12. What are the attribute commands for a line color?

setPolylineColourIndex (61);

13. What is color table? List the color codes.

Color tables are an alternate means for providing extended color capabilities to a user without requiring large frame buffers.

14. What is a marker symbol and where it is used?

The appearance of displayed characters is controlled by attributes such as font, size, color, and orientation. Attributes can be set both for entire character strings (text) and for individual characters defined as marker symbols.

15. Discuss about inquiry functions.

Current settings for attributes and other parameters, such as workstation types and status, in the system lists can be retrieved with inquiry functions. These functions allow current values to be copied into specified parameters, which can then be saved for later reuse or used to check the current state of the system if an error **occurs.**

16. Define translation and translation vector.

A translation is applied to an object by repositioning it along a straight-line path from one coordinate location to another. The translation distance pair *(t,, t,)* is called a translation vector or shift vector.

17. Define window and view port.

A world-coordinate area selected for display is called a window. An area on a display device to which a window is mapped is called a viewport. The window defines ***what*** is to be viewed; the viewport defines ***where*** it is to be displayed.

Window - defines what is to be viewed

View Port defines where it is to be displayed

18. Define viewing transformation.

The mapping of a part of a world-coordinate scene to device coordinates is referred to as a viewing transformation.

19. Give the equation for window to viewport transformation.

$M_{WC.VC} = R.T$

20. Define view up vector.

First, a viewing-coordinate origin is selected at some world position: **Po = *(x,,*** yo). Then we need to establish the orientation, or rotation, of this reference frame. One way to do this is to specify world vector V that defines the viewing y, direction. Vector V is called the view up vector.

21. What is meant by clipping? Where it happens?

Any procedure that identifies those portions of a picture that are either inside or outside of a specified region of space is referred to as a **clipping algo**rithm, or simply clipping. The region against which an object is to clipped is called a clip **window.**

22. What is point clipping and what are its inequalities?

Assuming that the clip window is a rectangle in standard position, we save a point P **= *(x, y)*** for display if the following inequalities are satisfied:

$xw_{min} <= x <= xw_{max}$

$yw_{min} <= y <= yw_{max}$

23. What is line clipping and what are their parametric representations?

A line segment with end points (x_1,y_1) and (x_2,y_2) one or both end points outside clipping rectangle, the parametric representation $x = x_1 + u(x_2 - x_1)$ $y = y_1 + u(y - y1)$

24. Write down two attributes of a line?

The line type, width and color are the attributes of the line. The line type include solid line, dashed lines, and dotted lines.

25. Distinguish between window port & view port?

A portion of a picture that is to be displayed by a window is known as window port. The display area of the part selected or the form in which the selected part is viewed is

known as view port.

26. What is the major difference between symmetric DDA and simple DDA.

"Simple DDA" does not require special skills for implementation.

27. **What is Text clipping? and List different types of text clipping methods available?**

Text clipping is to clip the components of individual characters. All or None text clipping, All or none character clipping and single character clipping.

28. Write down the shear transformation matrix.

Shear is a transformation that distorts the shape of an object such that the transformed shape appears as if the object were composed of internal layers that had been caused to slide over each other. Two common shearing transformations are those that shift coordinate x values and those that shift y values. An x direction shear relative to the x axis is produced with the transformation matrix

$$\begin{matrix} 1 & shx & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{matrix}$$

Which transforms coordinate positions as X' = x + shx.y y' =y.

29. What is Transformation?

Transformation is the process of introducing changes in the shape size and orientation of the object using scaling rotation reflection shearing & translation etc.

30. What is translation?

Translation is the process of changing the position of an object in a straight-line path from one coordinate location to another. Every point (x , y) in the object must under go a displacement to (xI,yI). the transformation is: x' = x + tx ; y' = y+ty

31. What is rotation?

A 2-D rotation is done by repositioning the coordinates along a circular path, in the x-y plane by making an angle with the axes. The transformation is given by:
X' = r cos (q + f) and Y' = r sin (q + f).

32. What is scaling?

A scaling transformation alters the size of an object. This operation can be carried out for polygons by multiplying the coordinate values (x,y) of each vertex by scaling factors sx and sy to produce the transformed coordinates (x', y'). x' = x. sx, y' = y. sy

33. What is shearing?

The shearing transformation actually slants the object along the X direction or the Y direction as required. ie; this transformation slants the shape of an object along a required plane.

34. What is reflection?

The reflection is actually the transformation that produces a mirror image of an object. For this use some angles and lines of reflection.

35. Define clipping?

Clipping is the method of cutting a graphics display to neatly fit a predefined graphics region or the view port.

36. What is the need of homogeneous coordinates?

To perform more than one transformation at a time, use homogeneous coordinates or matrixes. They reduce unwanted calculations intermediate steps saves time and memory and produce a sequence of transformations.

37. Distinguish between uniform scaling and differential scaling?

When the scaling factors sx and sy are assigned to the same value, a uniform scaling is produced that maintains relative object proportions. Unequal values for sx and sy result in a differential scaling that is often used in design application

38. What is fixed point scaling?

The location of a scaled object can be controlled by a position called the fixed point that is to remain unchanged after the scaling transformation.

39. What is Zooming?

Zooming means enlarging a digital image to see it more clearly or make it easier to alter. It allows the user to see more detail for a specific area of the image.

40. What is Rubber Banding?

Rubber Banding is another form of zooming. The user can use a mouse to define two corners of a rectangle. The selected area can be copied to a clipboard, cut, moved or zoomed.

41. What is an output primitive?

Graphics programming packages provide function to describe a scene in terms of these basic geometric structures, referred to as output primitives.

42. List out the graphics applications

- Paint programs: Allow you to create rough freehand drawings. The images are stored as bit maps and can easily be edited.
- **Illustration/design programs:** Supports more advanced features than paint programs, particularly for drawing curved lines. The images are usually stored in vector-based formats. Illustration/design programs are often called draw programs.
- Presentation graphics software: Lets you create bar charts, pie charts, graphics, and other types of images for slide shows and reports. The charts can be based on data imported from spreadsheet applications.

- Animation **software:** Enables you to chain and sequence a series of images to simulate movement. Each image is like a frame in a movie.
- CAD **software:** Enables architects and engineers to draft designs.

43. **What is meant by aliasing? (Nov/Dec 2016)**

The distortion of information due to low frequency sampling (Under sampling) is called aliasing. We can improve the appearance of displaying raster lines by applying antialiasing methods that compensate for the under sampling process.

44. Digitize a line from (10,12) to (15,15) on a raster screen using Bresenham's straight line algorithm.

(11,13), (12,13), (13,14), (14,14) and (15,15)

45. State the nature of Line Primitive in Graphics? (NOV/DEC 2015)

The line type, width and color are the attributes of the line. The line type include solid line, dashed lines, and dotted lines.

46. Define the viewing pipeline? (NOV/DEC 2015)

The **viewing pipeline** is a group of processes common from wireframe display through to near photo-realistic image generation, and is basically concerned with transforming objects to be displayed from specific viewpoint and removing surfaces that cannot be seen from this viewpoint.

47.**Define Aspect Ratio**. **(NOV/DEC 2016)**

The ***aspect ratio*** of an image describes the proportional relationship between its width and its height. It is commonly expressed as two numbers separated by a colon, as in 16:9. For an *x*:*y* aspect ratio, no matter how big or small the image is, if the width is divided into *x* units of equal length and the height is measured using this same length unit, the height will be measured to be *y* units.

PART B

1. Consider a line from (0,0) to (6,7).Using simple DDA algorithm,rasterize thisline.(**An**)
2. Applying Bresenham’s algorithm to draw a line from (4,4) and end point is (-3,0).(**An**)
3. Plot a circle at origin having centre as (0,0) and radius=8 using Bresenham’s circle algorithm.(**NOV/DEC 2016)(An)**
4. Plot a circle using the midpoint algorithm whose radius=3 and center is at (0,0). (**An**)
5. The input ellipse parameters are rx=8 and ry=6.Using midpoint ellipse method, rasterize this ellipse. (**An**)
6. Explain in detail about line attributes with neat diagram.(R)
7. Explain briefly about curve attributes?(8) **(NOV/DEC 2015)** .(R)
8. Explain three primary color used in graphics and explain how other colors are

achieved? **.(R)**

9. Explain in detail about color and grey scale levels? **.(R)**
10. Explain color and grey scale levels. **.(R)**
12. Explain the area fill attributes and character attributes. **.(R)**
13. Explain character attributes in detail. **.(R**)
14. Briefly discuss about basic 2D transformations.(8) **(NOV/DEC 2015) .(R)**
15. Discuss about composite transformations.(**An)**
16. Explain about reflection and shear.(**R**)
17. Explain cohen- sutherland line clipping algorithm with an example. (**R**)
18. Discuss the logical classifications of input devices.(**R**)
19 . Explain the details of 2d viewing transformation pipeline.(**R**)
20 . Explain point, line, curve, text, exterior clipping?(**R**)
21 . Explain the basic concept of Midpoint ellipse algorithm. Derive the decision parameters for the algorithm and write down the algorithm steps. (16)(**May/June 2016**)(**R**)
22. Explain two dimensional Translation and Scaling with an example. (8) (**R**)
23. Obtain a transformation matrix for rotating an object about a specified pivot point. (16)
24. Explain DDA line drawing algorithm. (16)(R)
25. What is polygon clipping? Explain Sutherland-Hodgeman algorithm for polygon (16)(R)
26. Consider a triangle ABC whose coordinates are A[4,1], B[5,2], C[4,3](**An**)
    a. Reflect the given triangle about X axis. (4)
    b. Reflect the given triangle about Y-axis. (4)
    c. Reflect the given triangle about Y=X axis. (4)
    d. Reflect the given triangle about X axis. (4)
27 . Explain Sutherland Hodgeman polygon clipping algorithm. Explain the Disadvantage of it and how to rectify this disadvantage. (16)(**R**)
28 . Explain Two Dimensional Viewing. (16) **(R**)
29. Write down and explain the midpoint circle drawing algorithm. Assume 10cm as the radius and co-ordinate origin as the centre of the circle (8)**(NOV/DEC 2015)**
30. Explain about Bresenham's circle generating algorithm.
31. Calculate the pixel location approximating the first octant of a circle having centre at (4,5) and radius 4 units using Bresenhams algorithm.(**An**)
32 . Discuss in brief: Antialising techniques. **(An)**
33 . Explain the different Graphics systems in detail with neat diagram?(**R**)
34. Write brief notes on clipping against rectangular boundaries?(8) **(NOV/DEC 2015) (R)**
35. Explain Liang-Barsky line clipping algorithm(8)(**NOV/DEC 2016**) (**R**)

36.i)Refelct the diamond-shaped polygon whose vertices are A(-1,0),B(0,-2),c(1,0)and D(0,2) about

1)the horizontal line y=2

2)The vertical libe x=2)(**NOV/DEC 2016**)(**An**)

ii)Perofmr a 45 rotation of triangle A(0,0),B(1,1),c(5,2) about p(-1,-1).(8) (**NOV/DEC**

2016)(**An)**

COURSE OUTCOME

Effectively and creatively solve a wide range of graphic design problems

UNIT-2

THREE-DIMENSIONAL CONCEPTS

Three-dimensional object representations − Three-Dimensional geometric and modeling transformations − Three-Dimensional viewing − Hidden surface elimination − Color models – Virtual reality – Animation.

COURSE OBJECTIVE

Be familiar with various software programs used in the creation and implementation of multi-media (interactive, motion/animation, presentation, etc.).

PART A

1. What are spline curves?

A spline curve is a mathematical representation for which it is easy to build an interface that will allow a user to design and control the shape of complex curves and surfaces. The general approach is that the user enters a sequence of points, and a curve is constructed whose shape closely follows this sequence. The points are called control points. A curve that actually passes through each control point is called an interpolating curve; a curve that passes near to the control points but not necessarily through them is called an approximating curve.

2. Define polygon or quadric surfaces. (NOV/DEC 2015)

Surfaces represented by second degree polynomials are quadratic surfaces. Ex: Sphere, Ellipsoid, Torus and cones.

3. What you mean by parallel projection?

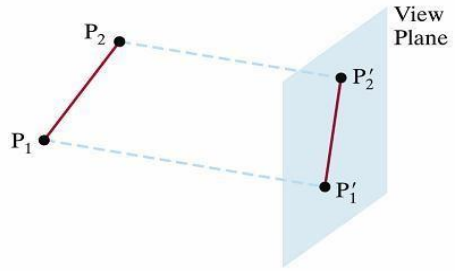
Parallel projection is one in which z coordinates is discarded and parallel lines from each vertex on the object are extended until they intersect the view plane.

4. What do you mean by Perspective projection?

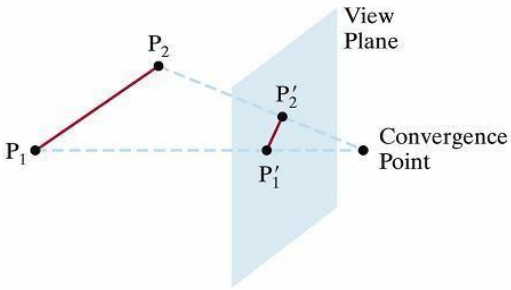
Perspective projection is one in which the lines of projection are not parallel. Instead, they all converge at a single point called the center of projection.

5. Differentiate parallel projection from perspective projection.

Objection descriptions are projected to the view plane



a. Parallel projection



b. Perspective projection

6. Categorize the 3D representations?

Boundary representation (B-reps) and space-partitioning representations.

7. What Boundary representation?

It describes a 3D object as a set of surfaces that separate the object interior from the environment. e.g. polygon facets and spline patches.

8. What space-partitioning representation?

This is used to describe interior properties, by partitioning the spatial region containing an object in to a set of small, non-overlapping, contiguous solids. e.g.octree.

9. What is Blobby Object?

Some objects do not maintain a fixed shape, but change their surface characteristics in certain motions or when in proximity to other objects. Examples in this class of objects include molecular structures, water droplets and other liquid effects, melting objects and muscle shapes in the human body. These objects can be described as exhibiting "blobbiness" and are often simply referred to as blobby objects, since their shapes show a certain degree of fluidity.

10. What is the Surface rendering?

It is used to generate a degree of realism in a displayed scene.

11. What are the different ways of specifying spline curve?

- Using a set of boundary conditions that are imposed on the spline.
- Using the state matrix that characteristics the spline
- Using a set of blending functions that calculate the positions along the curve path by specifying combination of geometric constraints on the curve

12. Write about depth cueing.

A simple method for indicating depth with wire frame displays is to vary the intensity of objects according to their distance from the viewing position - Line closest to the viewing position are displayed with highest intensities - Lines Farther - > Decreasing Intensities

Uses: Choosing maximum and minimum intensities Range of distances over which the intensities are to vary Modeling the effect of atmosphere

13. What is projection?

The process of displaying 3D objects on a 2D display is called as Projection.

14. What is meant by view reference coordinate systems?

View Plane defined by:

- point on the plane - **View Reference Point** (VRP)
- normal to the plane pointing towards the center of projection- **View-Plane Normal** (VPN)

view plane can be anywhere in the world-space
The center of projection represents the location of the viewer's eye or the camera's lens.
Need to define a 3D **Viewing Reference Coordinate system** (VRC) which has axis u, v, n

- Origin of VRC is the VRP
- n axis of VRC is the VPN
- v axis of VRC is called the **View-UP vector** (VUP)
- u axis of VRC is defined to form a right-hand coordinate system with n and v

Viewpoint Coordinate System -Also known as the "camera" coordinate system. This coordinate system is based upon the viewpoint of the observer, and changes as they change their view. Moving an object "forward" in this coordinate system moves it along the direction that the viewer happens to be looking at the time.

15. What are the steps involved in 3D transformation?

- Modeling Transformation
- Viewing Transformation
- Projection Transformation
- Workstation Transformation

16. What do you mean by view plane?

A view plane is nothing but the film plane in camera which is positioned and oriented for a particular shot of the scene.

17. What is Projection reference point?

In Perspective projection, the lines of projection are not parallel. Instead, they all converge at a single point called Projection reference point.

18. What is center of projection? What is the other name of it?

The center of projection represents the location of the viewer's eye or the camera's lens.

19. What is the Surface rendering?

It is used to generate a degree of realism in a displayed scene.

20. What is Composite transformation? (May/June 2016)

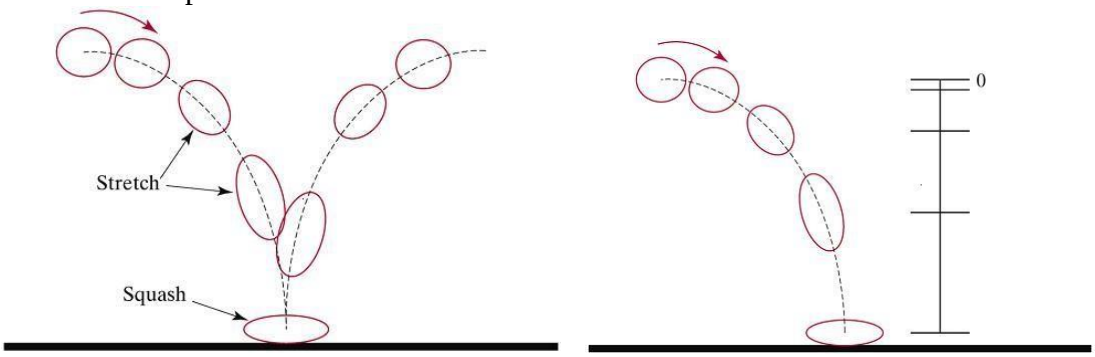
It can be formed by multiplying the matrix representation for the individuals operations in the transformation sequence

21. **How are fractals classified?**

- A Fractal is an object whose shape is irregular at all scales.
- The patterns in the random fractals are no longer perfect and the random defects at all scale.
- A geometric fractal is a fractal that repeats self-similar patterns over all scales.
- Exact self similarity
- Quasi self similarity and Statistical self similarity

22. **List any four Animation techniques**

a. Squash and stretch
b. Timing
c. Follow-through actions
d. Staging
e. Anticipation



23. What does Y, I, Q represent in YIQ color model?

- Y is luminance only part picked up by Black and White Televisions
- Y is given most bandwith in signal
- I, Q channels (or U,V) contain chromaticity information

24. Define Morphing. (NOV/DEC 2016)

Transformation of object shapes from one form to another is called morphing.

25. Define View port with an example.

An area on a display device to which a window is mapped is called a view port.

26. What is chromaticity?

The term chromaticity is used to refer collectively to the two properties describing color characteristics: Purity and dominant frequency.

27. Define Color model.

A Color model is a method for explaining the properties or behavior of color within some particular context.

28. What are the uses of chromaticity diagram?

The chromaticity diagram is useful for the following: Comparing color gamuts for different sets of primaries. Identifying complementary colors. Determining dominant wavelength and purity of a given color.

29. Give the transformation matrix for conversion of RGB to YIQ.

$$\begin{pmatrix} Y \\ I \\ Q \end{pmatrix} = \begin{pmatrix} 0.299 & 0.587 & 0.144 \\ 0.596 & 10.275 & -0.321 \\ 0.212 & -0.528 & 0.311 \end{pmatrix} \cdot \begin{pmatrix} R \\ G \\ B \end{pmatrix}$$

30. What is HSV model?

The HSV(Hue,Saturation,Value) model is a color model which uses color descriptions that have a more intuitive appeal to a user. To give a color specification, a user selects a spectral color and the amounts of white and black that are to be added to obtain different shades, tint, and tones.

31. What for CMY color model used?

A color model defined with the primary colors cyan, magenta, and yellow is useful for describing color output to hard-copy devices.

32. What are the parameters in the HLS color model?

Hue, Lightness and Saturation.

33. Define Computer animation.

Computer animation refers to any time sequence of visual changes in a scene. In addition to changing object position with translations or rotations, a computer generated animation could display time variations in object size, color, transparency, or surface texture.

34. What are the steps in animation sequence?

- Story board layout
- Object definition
- Key-frame specifications
- Generation of in-between frames

35. How frame-by-frame animation works?

Here each frame of the scene is separately generated and stored. Later the frames can be recorded on film or they can be consecutively displayed in "real-time playback" mode.

36. What is morphing?(NOV/DEC 2016)

Transformation of object shapes from one form to another is called morphing.

37. What are the methods of motion specifications?

- Direct motion specification
- Goal-directed Systems
- Kinematics and Dynamics.

38. Explain vanishing point and principal vanishing point.

Projections of lines that are not parallel to the view plane (i.e. lines that are not perpendicular to the view plane normal) appear to meet at some point on the view plane. This point is called the vanishing point. A vanishing point corresponds to every set of parallel lines. Vanishing points corresponding to the three principle directions are referred to as "Principle Vanishing Points (PVPs)". We can thus have at most three PVPs. If one or more of these are at infinity (that is parallel lines in that direction continue to appear parallel on the projection plane), we get 1 or 2 PVP perspective projection.

39. What is called axonometric and isometric projections?

Projectors are orthogonal to the projection plane but plane can be at angle to principal face

- Isometric – symmetric with all three axes
- Dimetric – symmetric with two axes
- Trimetric – general case
- Produces foreshortening of distances

40. Give the general expression of Bezier Bernstein polynomial.

$P(u) = \sum M!/((M-K)!K!)\ U^K(1-U)^{M-K}P_K$, $0 \leq U \leq 1$ and $U^k=0$ when u and k both zero.

41. Give the single point perspective projection transformation matrix when projectors are placed on the z-axis.

Refer class notes

42. What are the advantages of B spline over Bezier Curve?

B-spline curves can be considered a generalization of Bezier curves; they share many properties (they must obey the convex hull property, for one). Advantages in using B-splines is that they do provide affine invariance. This means that the coordinate system it is represented in can change without affecting the relative geometry of the curve; this is seen when the geometry of curve remains consistent when it is rotated, scaled, or translated. B-spline curves also address the issue of local control. This means that that modifying one control point only affects the part of the curve near that control point, which is really useful when designing shapes.

43. What is Critical Fusion Frequency?

Frequency of a light stimulation at which it becomes perceived as a stable and continuous sensation. That frequency depends upon various factors: luminance, colour, contrast, retinal eccentricity, etc.

44. Define color model.

A Color model is a method for explaining the properties or behavior of color with in some particular context.

45. Define dominant frequency.

If low frequencies are predominant in the reflected light, the object is described as red. In this case, the perceived light has the dominant frequency at the red end

of the spectrum. The dominant frequency is also called the hue, or simply the color of the light.

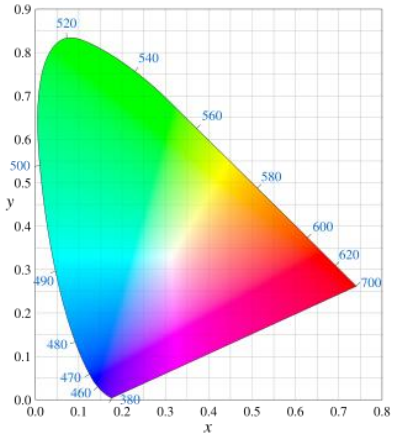
46. Define complementary colors.

If the 2 color sources combine to produce white light, they are called complementary colors. E.g., Red and Cyan, green and magenta, and blue and yellow.

47. Define colors gamut.

Color models that are used to describe combinations of light in terms of dominant frequency use 3 colors to obtain a wide range of colors, called the color gamut.

48. CIE Chromaticity Diagram



49. Define about shades, tint and tones.

- A **shade** is the mixture of a color with black, which reduces lightness.
- A **tint** is the mixture of a color with white, which increases lightness
- A **tone** is produced either by mixing with gray, or by both tinting and shading.

50. Describe about RGB 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 conventional photography. Before the electronic age, the RGB color model already had a solid theory behind it, based in human perception of colors.

51. Explain about HLS model.

HSL stands for *hue*, *saturation*, and *lightness*, and is often also called **HLS**.

This HLS model describes colours in the following terms:

- Hue, which is the horizontal axis of square box in the picture above, and varies from magenta - red - yellow - green - cyan - blue - magenta.

- Saturation, which is the vertical axis of the square box, and describes how "grey" the colour.
- Lightness, which is the second picture box and varies from black through the colour to white.

With this model it is easier to pick the correct colour. The model also allows you to do some things in code which you can't really achieve with RGB, such as determining what a lighter or darker tone of a given RGB colour is.

52. Explain about HSV model.

The HSV(Hue, Saturation, Value) model is a color model which uses color descriptions that have a more intuitive appeal to a user. To give a color specification, a user selects a spectral color and the amounts of white and black that are to be added to obtain different shades, tint, and tones.

53. Define CMY.

Cyan, magenta, and yellow are the secondary colors with respect to the primary colors of red, green, and blue. However, in this subtractive model, they are the primary colors and red, green, and blue, are the secondaries. In this model, colors are formed by subtraction, where adding different pigments causes various colors not to be reflected and thus not to be seen. Here, white is the absence of colors, and black is the sum of all of them. This is generally the model used for printing.

Difference between CMY and HSV.

54. Define computer animation.

Computer animation refers to any time sequence of visual changes in a scene. In addition to changing object position with translations or rotations, a computer generated animation could display time variations in object size, color, transparency, or surface texture.

55. List out steps involved in computer animation sequence.

- Story board layout
- Object definition
- Key-frame specifications
- Generation of in-between frames

56. List out Computer Animation Languages.

What is Keyframe.

- Animation functions include a graphics editor, a key frame generator and standard graphics routines.
- The graphics **editor** allows designing and modifying object shapes, using spline surfaces, constructive solid geometry methods or other representation schemes.
- Scene description includes the positioning of objects and light sources defining the photometric parameters and setting the camera parameters.

- Action specification involves the layout of motion paths for the objects and camera.
- **Keyframe** systems are specialized animation languages designed dimply to generate the in-betweens from the user specified keyframes.
- Parameterized systems allow object motion characteristics to be specified as part of the object definitions. The adjustable parameters control such object characteristics as degrees of freedom motion limitations and allowable shape changes.
- Scripting systems allow object specifications and animation sequences to be defined with a user input script. From the script, a library of various objects and motions can be constructed.

57. Define Raster Animation? (NOV/DEC 2015)

Raster based animation frames (and all raster images for that matter) are made up of individual pixels. These pixels each contain information about the color and brightness of that particular spot on the image. This is somewhat similar to the concept of pointillism in painting, with the sum of the points making up the totality of the picture or frame.

58. Define Morphing(NOV/DEC 2016)

Transformation of object shapes from one form to another is called morphing.

59. What is Virtual reality?

Virtual reality is an artificial environment that is created with software and presented to the user in such a way that the user suspends belief and accepts it as a real environment. On a computer, virtual reality is primarily experienced through two of the five senses: sight and sound.

PART B

1. Discuss the three-dimensional composite transformation. **(R)**
2. Differentiate parallel and perspective projection. (An)
3. Explain in detail about Rotations in 3D space?(8) **(NOV/DEC 2015)(R)**
4. Explain the 3-d transformation for translation, rotation, scaling?(**NOV/DEC 2016**)
5. Describe how 3D curves are stored in computers? **(8)(NOV/DEC 2015)**
6. Explain about 3D object representation. **(R)**
7. Write notes on quadratic surfaces.(8) **(R)**
8. Discuss the Characteristics of Bezier curves and Bezier surfaces in detail (12). **(An)**
9. Write a short note on B-spline curves (4) **(R)**
11. How do you implement the Morphing animation technique? Discuss with an example(8) **(R)**
12. Compare Bezier curve and B splines. **(An)**

13. Define Animation. Explain in detail about the animation language (8) **(R)**
14. Describing briefly Modeling and Coordinate transformation in computer graphics. **(R)**
15. Derive the Outline projection of coordinate position(x,y,z) to position (x_0,y_0) on the view plane
16. Compare HLS and HSV color models. **(An)**
17. Discuss about the Properties of light. **(R)**
18. Explain any one visible surface identification algorithm. **(R)**
19. Explain a method to rotate an object about an axis that is not parallel to the coordinate axis with neat diagram and derive the transformation matrix for the same. **(R)**
20. Discuss on the various visualization techniques.(8) **(An)**
21. Discuss on Area subdivision method of hidden surface identification algorithm. **(R)**
22. Explain Virtual reality in detail? **(R)**
23. Discuss briefly about parallel projections.(8) **(NOV/DEC 2015) (R)**
24. Write brief notes on color models?(8) **(NOV/DEC 2015) (R)**
25. Explain about parallel Projection Method(8) **(NOV/DEC 2016) (R)**
26. Explain the painter's algorithm for vsible surface detection(8) (**NOV/DEC 2016**) **(R)**
27. How do you represent 3Dobjects using Octrees(8) **(NOV/DEC 2016) (An)**
28. Explain the depth-buffer method for visible surface detection(8)(**May/June 2016**) **(R)**
29. write notes on YIQ and SV color Models(8) (**May/June 2016**) **(R)**

COURSE OUTCOME

To Form effective and compelling interactive experiences for a wide range of audiences

UNIT III

MULTIMEDIA SYSTEMS DESIGN

Multimedia basics − Multimedia applications − Multimedia system architecture − Evolving technologies for multimedia − Defining objects for multimedia systems − Multimedia data interface standards − Multimedia databases.

COURSE OBJECTIVE

Be aware of current issues relative between new emerging electronic technologies and graphic design (i.e. social, cultural, cognitive, etc).

PART A

1**. Define Multimedia?**

Multimedia is defined as a Computer based Interactive Communication process that incorporates text, numeric data, record based data, graphic art, video and audio elements,

animation etc. It is used for describing sophisticated systems that support moving images and audio. Eg. Personal Computer.

2. Give the applications of Multimedia? (NOV/DEC 2016)

1. Document Imaging
2. Image Processing and Image Recognition
3. Full Motion Digital Video Applications
4. Electronic messaging
5. Entertainment
6. Corporate Communications

3. What are the data elements of Multimedia? (NOV/DEC 2015),(MAY/JUNE 2016)

1. Facsimile
2. Document Images
3. Photographic Images
4. Geographic Information System Maps (GIS)
5. Voice Commands and Voice Synthesis
6. Audio Messages
7. Video Messages
8. Full motion stored and Live Video
9. Holographic Images
10. Fractals

4. State the resolution of Facsimile, Document Images and Photographic Images?

- Facsimile-100 to 200 dpi (dots/pixels per inch)
- Document images – 300 dpi
- Photographic images – 600 dpi

5. What is the compression technique used in Facsimile and Document Images?

- Facsimile - CCITT Group3
- Document Images - CCITT Group4

6. What are the applications of Photographic Images?

1. Photographic images are used in Imaging Systems that are used for identification
2. Security Badges
3. Fingerprint Cards
4. Photo Identification Systems
5. Bank Signature Cards
6. Patient Medical Histories

7. What is the use of Document Images?

It is used for storing business documents that must be retained for long periods of time and accessed by large number of people. It removes the need for making several copies for storage or distribution.

8. Explain about GIS Systems?

GIS means Geographic Information System maps. It is used for natural resource and wild life management and urban planning.

9. What are the two technologies used for storage and display of GIS systems?

•Raster Storage
•Raster Image (Raster Image has basic color map, vector overlay and text display)

10. Explain about Voice Synthesis?

This approach breaks down the message completely to a canonical form based on phonetics. It is used for presenting the results of an action to the user in a synthesized voice. It is used in Patient Monitoring System in a Surgical Theatre.

11. What is Isochronous Playback?

Isochronous playback is defined as a playback at a constant rate. Audio and Video systems require isochronous playback.

12. Explain about Full motion and live video?

- Full motion video refers to prestored video clip. i.e., video stored in CD
  Eg: games, courseware, training manuals, MM online manuals etc Live video refers to live telecast.
- It is live and must be processed while the camera is capturing it i.e., Instant occurring is transferred at the same time.
  Eg: Live Cricket Show (in television)

13. Explain the terms Holography and Hologram?

Holography is defined as the means of creating a unique photographic image without the use of lens. The photographic recording of the image is called a Hologram.

14. State the use of Holographic images?

It is used in design and manufacturing tasks. Holographs on credit cards are used to ensure authenticity.

15**. State the properties of Holographic images?**

Holographic images are
• Not clear diagrams
• 3-dimensional
• can also be recorded on materials other than photographic plates
• Records intensity of light and phase
• created by coherent light using a laser beam

16. Define Fractals?

Fractals are regular objects with a high degree of irregular shapes. It is a lossy Compression technique but it doesn't change the shape of the image. Fractals are decompressed images that result from a compression format

17. Explain Fractal Compression?

Fractal Compression is based on image content i.e., it is based on similarity of patterns within an image. The steps in Fractal compression are

• A digitized image is broken into segments
• The individual segments are checked against a library of fractals
• The library contains a compact set of numbers called iterated function system codes.
• These system codes will reproduce the corresponding fractal

18. State the applications of Document Imaging?

Document Imaging is used in organizations such as

a. Insurance agencies
b. Law offices
c. Country and State Governments
d. Federal Government
e. Department of Defence (DOD)

19. Define Compression Efficiency?

Compression Efficiency is defined as the ratio in bytes of an uncompressed image to the same image after compression.

20. What is Image Processing?

Image Processing refers to processing a digital image using a digital computer.

An image processing system will alter the contents of the image. It involves Image Recognition, Image Enhancement, Image Synthesis and Image Reconstruction.

21. Explain Image Calibration?

The overall image density is calibrated. In Image calibration the image pixels are adjusted to a predefined level.

22. What is Grayscale Normalization?

The overall grayscale of an image or picture is evaluated to determine if it is skewed in one direction and if it needs correction.

23. What is Frame Averaging?

The intensity level of the frame is averaged to overcome the effects of very dark or very light areas by adjusting the middle tones.

24. What is Image Animation?

Images are displayed sequentially at controlled display speeds to provide image animation. Image Animation is the basic concept of displaying successive images at short intervals to give the perception of motion.

Image Animation is a technology developed by Walt Disney and brought to every home in the form of cartoons.

25. How Image Annotation is done? (NOV/DEC 2016)

Image Annotation can be performed in two ways

•As a text file stored along the image.

•As a small image stored with the original image.

26. Explain Optical Character Recognition (OCR)?

Optical Character Recognition is used for data entry by scanning typed or printed words in a form. OCR technology is now available in software it has the capability to decipher a large number of printed fonts used in many document image applications. It is used for reading the number of invoice or for capturing entire photographs of text.

27. Explain about Handwriting Recognition?

It is used for recognizing hand written characters. The key consideration of these systems is the ability to recognize the writer-independent cursive handwriting in real time. It has been evolved from pen-based systems and it allows the user to write commands on an electronic tablet.

28. How does a Handwriting engine work?

The Handwriting engines use the following techniques

1. Complex Algorithms - to capture data in real time
2. Shape Recognizer - to determine the geometry and topology of stroke
3. Prototype Character set - the strokes are compared with the predefined Prototypes until a match is found
4. Context Analyzer - used to check a collection of characters treated as a word
5. Dictionary - the word is checked here and corrections are indicated based on potential matches 4.

29. What is Vector Data?

Vector data is the collection of points and some mathematical functions. It treats an image as a series of points (or collection of dots) and mathematical functions that describe the figures such as line, circles, arcs etc.

30. Define Vectorisation?

The process of converting rustered (scattered) data into vector data is known as Vectorisation.

31. What are the properties of Full-motion video clip?

• Full-motion video clips should be sharable
• It is possible to attach Full-motion video clips to other documents such as memos, text, presentations etc
• Full-motion video clips should be indexed
• Users should be able to place their own indexing
• It should be possible to view the same clip on a variety of display terminal types with varying resolutions
• It should be possible for users to move and resize the window displaying the video clip
• Users should be able to adjust the contrast, brightness and volume of the video clip
• Users should be able to suppress sound or mix sound from other sources
• When video clips are spliced the sound components are spliced separately

32. Explain the infrastructure required by a multimedia enabled E-mail system?

- Message store and forward facility
- Message Transfer agents
- Message Repositories(servers)
- Repositories
- Electronic Hypermedia messages
- Dynamic access and Transaction managers
- Local and Global directories
- Automatic Database Synchronization

- Automatic Protocol Conversions
- Administrative tool

33. State the applications of Non-Textual Image Recognition?

1. Recognition of human faces
2. Interpretation of facial expressions
3. Designing, Manufacturing and Medical fields
4. Security systems

34. What is meant by Multimedia database? (NOV/DEC 2015)

A **Multimedia database** (MMDB) is a collection of related **multimedia** data. The **multimedia** data include one or more primary media data types such as text, images, graphic objects (including drawings, sketches and illustrations) animation sequences, audio and video.

PART-B

1. Explain list of Multimedia applications. Explain them briefly. **(R)**
2. Briefly discuss the history and future of Multimedia. **(R)**
3. Explain the characteristics of MDBMS. **(R)**
4. Write short notes on multimedia system architecture. (8) **(NOV/DEC 2015) (R)**
5. What is multimedia? Explain the properties of multimedia systems. **(R)**
6. Explain the data stream characteristics for continuous media. **(R)**
7. Explain the different file formats used in multimedia. **(May/June2016), (NOV/DEC 2016) (R)**
8. Suggests with reasons 5 potential applications of multimedia other than the applications in the field of entertainment and education. **(R)**
9. Explain various multimedia interface standards. (8) **(NOV/DEC 2015) (R)**
10. Describe various building block of multimedia system. **(R)**
11. Write short notes on MDBMS. **(R)**
12. Explain Database Organization for Multimedia Applications. **(R)**
13. Explain 3-D Technology and Holography. **(R)**
14. (i) Explain hypermedia and its functions. (8)

    (ii) Short notes on Multimedia databases. (8) **(NOV/DEC 2016) (R)**
15. Write brief notes on multimedia storage and retrieval? (8) **(NOV/DEC 2015) (R)**
16. Explain in detail about full motion digital video applications? **(NOV/DEC2015)**
17. Write about the use of Full-motion Video in Multimedia applications.(8)(**May/June2016**)

18.Write about Multimedia Suystem Architecture(8)(**May/June2016**) **(R)**

19.Write about the data types of Multimedia Systems. (**May/June2016**) **(R)**

COURSE OUTCOME

Use various software programs used in the creation and implementation of multi-media (interactive, motion/animation, presentation, etc.).

UNIT IV

MULTIMEDIA FILE HANDLING

Compression and decompression − Data and file format standards − Multimedia I/O technologies − Digital voice and audio − Video image and animation − Full motion video − Storage and retrieval technologies.

COURSE OBJECTIVE

Appreciate the importance of technical ability and creativity within design practice.

PART A

1. What is Image Compression?

Image Compression is the process of reducing the size of the image by removing redundant information in a lossless or lossy manner to conserve storage space and transmission time.

2. What is the need for Compression?

To manage large multimedia data objects efficiently Reduce file size for storage of objects Compression eliminate redundancies in the pattern of data .

3. State the two types of Compression?

1. Lossy Compression
2. Lossless Compression

4. What is Lossy Compression? (NOV/DEC 2015)

Lossy compression causes some information to be lost. Even if some data is lost it does not affect the originality of the image. It is used for compressing audio, grayscale or color images and video objects in which absolute data accuracy is not essential. it is used in Medical Screening Systems, Video teleconferencing and Multimedia Electronic messaging systems

5. What is Lossless Compression?

Lossless compression preserves the exact image throughout the compression and decompression process. Lossless Compression techniques are good for text data and for repetitive images in images like binary and grayscale images.

6. What are the advantages of Compression?

- Compressed data object
- Require less disk memory space for storage
- Takes less time for transmission over a network

7. State the types of Lossy Compression?

- JPEG (Joint Photographic Experts Group)
- MPEG (Moving Picture Experts Group)
- Intel DVI (Digital Video Interface)
- CCITT H.261(P*64)
- Fractal

8. State the types of Lossless Compression?

1. Packbits Encoding
2. CCITT Group3 1D
3. CCITT Group3 2D
4. CCITT Group 4
5. Lempel-Ziv and Welch Algorithm (LZW) CCITT

9. What is A Binary Image?

Binary Images contain black and white pixels and generated when a document is scanned in a binary mode.

10. What is Cadecs?

Compression and decompression software or programs are called Cadecs.

11**. What is Cadence?**

Cadence is the term used to define the regular rise and fall in the intensity of sound. Examples are the beats in music, changes in intensity of sound as a person speaks.

12. Explain about Busy Image and Continuous-tone Images?

In a Busy image adjacent pixels or group of adjacent pixels change rapidly. The grayscale or color images or known as Continuous-tone images

13. What is Negative or Reverse Compression?

If the number of bytes is increased than the bytes in runlentgh encoding.i.e. If the number of bytes is increased than the original image during Compression then it is called Negative Compression.

14. Give some applications of compression and Decompression Techniques?

1. Facsimile Systems
2. Printer Systems
3. Document Storage and Retrieval Systems
4. Video Teleconferencing Systems
5. Electronic Multimedia Messaging Systems
6. Medical Screening Systems

15. Explain Magnetic Media Technology?

In magnetic media data is stored on magnetic medium by magnetization of particles in the medium. Magnetization is caused by passing current through a coil in the read write head.

16. Mention the advantages of hard drives?

1. High capacity storage
2. Availability of low cost

17. Explain ST506 and MFM hard drives?

It is an interface developed by Seagate. ST506 defines the operation of signals between a hard disk controller and the hard disk. It is used to control platter speed and the movement of heads for a drive. ST506 have two ribbon cables i.e., a 36-pin and 20-pin cable. The encoding schemes used are MFM, FM and RLL (Run Length Limited).

18. What is MFM?

MFM means Modified Frequency Modulation. Parallel data is converted to a series of encoded pulse by MFM.

19. Explain ESDI hard drive?

ESDI means Enhanced Small Device Interface. It converts the data into serial bit streams. It uses two ribbon cables, 36-pin cable for control signal and a 20-pin cable for data signal.

20. Explain IDE?

IDE means Integrated Device Electronics. IDE interface supports two drives; one acts as master and other as slave. A jumper on drive electronics configures the drive as master or a slave.

21. Explain SCSI?

SCSI means Small Computer System Interface. It was developed by X3T9.2 Standard. It defines both hardware and software interfaces.

22. Explain SCSI 1?

SCSI1 defines an 8-bit parallel data path between a host adapter and a device. The SCSI1 specification calls the host adapter an initiator and the device as target. There can be a combination of up to eight initiators and targets daisy chained on the bus.

23. State the different phases of a SCSI bus and its uses?

- Arbitration phase - an initiator starts arbitration and tries to acquire the bus
- Selection phase - selects the target to which it needs to talk
- Command Phase - request a command from the initiator
- Data Phase - request data transfer with the initiator
- Status Phase - indicates the end of data transfer to the initiator
- The Message Phase - target enters this phase to interrupt the initiator's signaling & completion of the read command
- Bus free Phase - phase without any activity on the bus; the bus can settle down
- Before the next transaction

24. Explain SCSI 2?

SCSI2 has faster data transfer rates. The new command defined for SCSI2 is tagged command. The tagged command was defined to queue up commands; up to 256 commands can be queued up for a single device.

25. State the two types of latency?

- Seek latency
- Rotational latency

26. State the types of Seek latency?

1. Mid transfer seek
2. Elevator seek

27. What is Overlapped seek?

Seek on one drive and then on second drive and then reconnect to first drive when seek is complete.

28. What is Midtransfer seek?

In midtransfer seek device controller can be set to seek during data transfer through a separate port provided on the SCSI chip.

29. What is elevator seek?

A track close to the head will be read first and then a more distant track even though the distant track was requested first.

30. State the two methods used to reduce latency?

- Zero latency read/write
- Interleave factor

31. Define Transfer rate?

Transfer rate is defined as the rate at which data is transfered from the drive buffer to the host adapter memory.

32. Give the formula for maximum throughput?

Max throughput for I/O = Block transfer size / Total latency
where, Total latency = T1 + T2 + T3 + T4 +T5

T1- Seek latency
T2 - Rotational latency
T3 - Time required to transfer data from disk to system memory
T4 - Firmware latency
T5 - Final action on data

33. Define I/O per second?

I/O per second is a measure of the number of Input / Output transactions performed in a second. It defines as I/O per second = Maximum throughput / Block size

34. What is Command Queuing?

Command queuing allows execution of multiple sequential commands with system CPU intervention. It helps in minimizing head switching and disk rotational latency.

35. Define Disk spanning?

Disk spanning is a method of attaching multiple drives to a single host adapter. In this approach all drives appear as a single contiguous logical unit. Data is written to the first drive first and when the first drive is full the controller switches to second drive and so on.

36. Explain RAID?

RAID – Redundant Array of Inexpensive Disks. RAID is a storage subsystem. It is an array of multiple disks. Here data is spread across multiple drives. RAID is used to achieve
Large storage capacity
Fault tolerance
Performance improvement
Mass storage systems

37. What are the key objectives of RAID systems?

1. Hot backup of disk systems
2. Large volume storage at lower cost
3. Higher performance at lower cost
4. Ease of data recovery

38. State some applications of RAID systems?

- Mainframe and N/w systems
- Super computers and Multimedia systems
- Data server applications

39. State the types of RAID systems? (NOV/DEC 2016)

RAID level 0 - Disk striping
RAID level 1 - Disk mirroring
RAID level 2 - Bit Interleaving of data
RAID level 3 – Parallel Disk Array
RAID level 4 – Sector Interleaving
RAID level 5 – Block Interleaving

40. What is Disk Striping?

RAID level 0 has multiple drives connected to a single disk controller. Data is striped to spread segments of data across multiple drives. The data being written to the disk is broken into segments. The first segment is written to first drive, second segment to second drive and so on. It is used in **database applications.**

41. **What is Disk Mirroring?**

RAID level 1 causes two copies of every file to be written on two separate drives. Each main drive has a mirror drive. All data written to main drive is written to the mirror drive at the same time. Complete data redundancy is achieved. It is used in mainframe and network systems.

42. Explain RAID level 2?

RAID level 2 is called as Bit Interleaving of data. It contains arrays of multiple drives connected to a disk array controller using SCSI channels. Data is written one bit at a time and it is interleaved across multiple drives. It also contains multiple check disks to detect and correct errors. It uses Hamming Error Correction Codes to detect and correct errors.

43. Explain On-the-fly parity generation and parity checking?

During data writes a parity bit is generated and written to the parity drive. During data reads parity checking takes place. This process is called On-the-fly parity generation and parity checking.

44. Explain Sector Interleaving?

RAID level 4 is called as Sector Interleaving. It writes successive sectors of data on different drives. Employs multiple data drives and a single dedicated parity drive. The first sector of data is written to first drive, second sector of data to second drive and so on. In RAID level 4 data is interleaved at sector level.

45. Explain Block Interleaving?

RAID level s is called as Block Interleaving. Data is block interleaved and it does not use a dedicated parity drive. Parity data is spread across multiple drives in the data stream. Multiple concurrent reads and writes can be performed in RAID 5.

46. What is the use of Optical Media?

Optical media is used for storing large volumes of data. It is indestructible and unaffected by magnetic field or water. E.g. Optical drives such as CD-ROM, WORM, and Rewriteable Optical Systems.

47. How Optical media is classified?

1. Optical media can be classified as follows
2. CROM - Compact Disc Read Only Memory
3. WORM - Write Once Read Many
4. Rewriteable
5. Multifunction

48. State the reasons for the growth of CD-ROM's?

- Ease of use and durability of data
- Random access capability
- Very high sound fidelity
- High storage volumes

49. What are the Physical layers in CD-ROM's?

- Polycarbonate Substrate
- Reflective Aluminium layer
- Protective coat of lacquer

50. Explain about the Polycarbonate Substrate layer?

CD-ROM's contain polycarbonate disc, which is 120mm in diameter, 1.2 mm in thickness and has a 15 mm spindle hole in center. Polycarbonate substrate contains lands and pits.

51. Write short notes on MPEG-2? (NOV/DEC 2015)

MPEG-2 (also known as H.222/H.262 as **defined** by the ITU) is a standard for "the generic coding of moving pictures and ISO/IEC 13818 **MPEG-2** at the ISO Store.

PART-B

1. List the types of fixed and removable storage devices available for multimedia, and discuss the strength and weakness of each one. **(R)**
2. Explain the data compression technique used in multimedia. **(R)**
3. Define MIDI. List its attribute. Compare and contrast the use of MIDI and digitized audio in multimedia production. **(NOV/DEC 2016) (R)**
4. List and explain important steps and considerations in recording and editing digital audio. **(R)**
5. Describe the capabilities and limitations of bitmap images and vector images. **(R)**
6. Define animation and describe how it can be used in multimedia. **(R)**
7. Explain Color, Gray Scale and Still Video Image Compression method. **(R)**
8. Explain data and file format standards. **(R)**
9. Explain multimedia input and output Technologies. **(8)(NOV/DEC 2015) (R)**
10. Uses of magnetic Storage in Multimedia Systems. **(R)**
11. Discuss briefly about image compression schemes? **(8) (NOV/DEC 2015) (An)**
12. Explain in detail about types of voice recognition system? **(8) (NOV/DEC 2015) (R)**
13. Explain in detail about TIFF implementation issues? (**8) (NOV/DEC 2015), (NOV/DEC 2016) (R)**
14. Explain about MPEG Compression(16)(**May/June 2016**) **(R)**
15. Explain in detail about RAID technology for storage for multimedia Systems(16)

(May/June 2016) (R)

COURSE OUTCOME

Discuss issues related to emerging electronic technologies and graphic design

UNIT V

HYPERMEDIA

Multimedia authoring and user interface − Hypermedia messaging − Mobile messaging − Hypermedia message component − Creating hypermedia message − Integrated multimedia message standards − Integrated document management − Distributed multimedia systems.

COURSE OBJECTIVE

Be familiar with various messaging used in the creation and implementation of Hybermedia and Distributed multimedia systems..

PART A

1. State the applications of Non-Textual Image Recognition?

a. Recognition of human faces
b. Interpretation of facial expressions
c. Designing, Manufacturing and Medical fields
d. Security systems
e.

2 What is Hypermedia?(May/June 2016)

The linking of media for easy access is called Hypermedia. The media may be of any type such as text, audio, video etc. A hypermedia document contains a text and any other sub objects such as images, sound, full-motion video etc

3. What is Hypertext?

The linking of associated data for easy access is called Hypertext. It is an application of indexing text to provide a rapid search of specific text strings in one or more documents. It is an integral component of Hypermedia. Hypermedia document is the basic object and text is a sub object.

4. What is multimedia PC:

Multimedia PC is a computer that has a CD-ROM or DVD drive and supports 8-bit and 16-bit waveform audio recording and playback, MIDI sound synthesis, and MPEG movie watching, with a central processor fast enough and a RAM large enough to enable the user to

play and interact with these media in real time, and with a hard disk large enough to store multimedia works that the user can create.

5. Where to use multimedia?

Multimedia improves information relation. Multimedia applications includes the following:

1. Business
2. Schools
3. Home

6. What is meant by Multimedia User Interface?

Multimedia user interface is a computer interface that communicates with users multiple media.

7. Define Virtual Reality Systems?

Virtual Reality systems are designed to produce the cognitive effect of feeling immersed in the environment. It is created by the computer using sensory inputs such as vision, hearing, feeling and sensation of motion.

8. State the key design issues that provide virtual reality functionality?

1. Human factors
2. Multimedia Inputs and Outputs
3. Virtual Reality Modeling
4. Virtual Reality Design considerations

9. What are the human factors involved in Virtual reality?

1. Color, Brightness and Shading
2. Object Recognition
3. Navigation
4. Motion Processing
5. Depth Processing
6. Lag aces and Shared Execution Environment
7. Business Process Workflow Applications

10. Explain about Cable convertor?

A Cable convertor is a small electronic channel convertor. It is connected between a cable of satellite dish and television. It allows user to select broadcast stations. Cable convertor consists of analog demodulation and switching circuits. It can select 60 or more analog channels.

11. What is Set-top system?

Set-top box is the short name for the next generation of digital information processing systems. Set-top system acts as a cable converter as well as programmable interface between user and service provider. It allows users to connect a computer system to a television set.

12. State the classifications of Business systems?

1. Dedicated Systems
2. Departmental Systems

13. What is Depth Perception?

1. Perceiving the change in the distance of the object from the eye is called depth perception. The three important factors in depth perception are
2. Motion
3. Pictorial Clues
4. Sensory Clues

1**4. Explain about Pictorial Clues?**

1. Pictorial Clues consist of
2. Changes in shapes and sizes
3. Changes in gradient of surfaces
4. Changes in density of objects
5. Field of vision
6. Change in brightness and light reflection from object surfaces

15. Define Lag?

Lag is defined as the time between the participant action and the associated application response. The design factors used to measure lag are

1. Location of multimedia object server
2. Network bandwidth
3. Capability of workstation to process multiple streams concurrently

16. State the approaches used for designing concurrent operation of multiple devices and user feedback?

1. Simulation Loops
2. Multiple Processes
3. Concurrent Objects

17. What is Simulation loop?

A set of objects such as sound clips, video clips, graphics and sensory stimuli participate in simulation. A procedure is created and timestep is allocated for each object. Each procedure is

assigned a slot in the timeline for simulation. It is called loop because the main process loops around the simple logic of which the object is scheduled next. The simulation rate is bound to the display rate.

18. What is meant by Multimedia Authoring systems?(NOV/DEC 2015)

An **authoring system** is a program that has pre-programmed elements for the development of interactive **multimedia software** titles. **Authoring systems** can be defined as **software** that allows its user to create **multimedia** applications for manipulating **multimedia** objects.

19. What are the design issues in Gesture recognition?

1. Start and end of gesture
2. Path recognition and velocity of movement
3. Combination effects of multiple related gestures
4. Environmental context in which the gesture was performed

20. State the User Interface design tools?

1. Media Editors
2. Authoring Application
3. Hypermedia Object Creation
4. Multimedia Object Locator and Browser

21. What is navigation?

Navigation refers to the sequence in which the application progress and objects are created, searched and used. It can be done in direct mode or browse mode.

22. State the different Metaphors used for Multimedia applications?

1. Organizer Metaphor
2. Telephone metaphor
3. Aural User Interface(AUI)
4. VCR Metaphor

23. Explain Organizer metaphor?

Organizer metaphor associates the concept of embedding multimedia objects in the appointment diary or notepad. The Lotus organizer was the first to use a screen representation of office-diary type organizer.

24. What is the use of Telephone metaphor?

The telephone metaphor combines normal windows user interface ideas with the telephone keypad. The telephone metaphor on a computer screen allows using the computer interface as telephone keypad is used.

25. Explain AUI?

Aural User Interface (AUI) allows computer systems to accept speech as direct input and provide an oral response to the user actions. The real challenge in AUI systems is to create an aural desktop that substitutes voice and ear for the keyboard and display.

26. Define Mobile Messaging? (NOV/DEC 2015)

Mobile Messaging (MM) is a presence enabled **messaging** service that aims to transpose the Internet desktop **messaging** such as ICQ or MSN experience to the usage scenario of being connected via a **mobile**/cellular device.

27. What is Scaling?

Scaling allows enlarging or shrinking the whole or part of an image. Image scaling is performed after decompression. The image is scaled to fit in a user defined window.

28. What is Zooming?

Zooming means enlarging a digital image to see it more clearly or make it easier to alter. It allows the user to see more detail for a specific area of the image.

29. What is Rubber Banding?

Rubber Banding is another form of zooming. The user can use a mouse to define two corners of a rectangle. The selected area can be copied to a clipboard, cut, moved or zoomed.

30. What is Frame Interleaving?

Frame Interleaving defines the structure of the video file in terms of the layout of sound and video components.

31. What is 1:1 interleaving?

1:1 interleaving means that the storage for every video frame is followed by storage for sound component of that frame.

32. What is programmed degradation?

The playback control can be exercised at the time of decompression and playback. This is called programmed degradation. Programmed degradation get into effective when the client workstation is unable to keep up with the incoming data.

33. What is the use of Planar Imaging Technique?

Planar Imaging Technique is used in computer-aided tomography (CAT scan) systems. It displays a two-dimensional cut of X-ray images through multi-dimensional data.

34. Explain user workstation?

User workstation can serve as the input node for voice or video input. It can also serve as the output node for text, graphics, image, audio/voice or video.

35. What is the use of Gateway nodes?

The gateway node is a standard means of communication with other systems.

36. What is the use of Database server?

The database server supports the database requirements of the application and stores the attribute information for real-world objects in the application. Database servers are based on the UNIX OS/2 or Windows platform.

37. What is the use of Voice mail server?

Voice mail server is connected to a PBX (Private Branch Exchange). It is used for voice mail messages.

38. What is the use of Audio Server?

Audio Server manages all digitized voice and audio objects. Audio servers should be capable of maintaining isochronous playback of audio objects.

39. Explain about the Video Server?

Video Server manages video objects. Video servers should be capable of maintaining constant playback speed.

40. What is the use of Audio/Video Duplication?

Audio/Video Duplication node allows users to create audio or videotapes for transportation of multimedia documents.

41. What is the use of Duplication station?

Duplication station is provides specialized high-speed duplication equipment such as diskettes, CD-ROM's, Recordable CD's, Optical disks, Optical tapes etc.

PART-B

1. Distinguish between multimedia system and hypermedia system. **(R)**
2. (i) List the main attribute, benefits and drawbacks of 3 types of authoring systems. (8)

   (ii) Write short notes on following.

   a. Mobile messaging. (4)

   b. Document management. (4) **(R)**

4. Explain time based and object oriented multimedia authoring tool. **(R)**
5. What is editing features? Explain it briefly. **(R)**
6. Briefly explain integrated document management in multimedia. **(8)(NOV/DEC 2015) (R)**
7. How to create hypermedia message? Give an example also explain hypermedia message components. (**NOV/DEC 2016) (R)**
8. Explain the components of Distributed multimedia Systems. **(8) (NOV/DEC 2015) (R) (May/June2016)**
9. Explain multimedia Authoring and User Interface design.(8)(**May/June2016**) (**NOV/DEC 2016) (R)**
10. Explain the types of multimedia authoring systems? **(8) (NOV/DEC 2015) (May/June2016) (R)**
11. Describe the term Hypermedia and applications? **(8) (NOV/DEC 2015) (May/June2016) (R)**
12. i) Descirbe the common forms of navigation for information access.(8)(**NOV/DEC 2016)**
    ii)Explain any two components of a typical multimedia application environment (8) (**NOV/DEC 2016) (R)**
13. Explain about key issues of data organization for multimedia systems(8)**(May/June 2016) (R)**

COURSE OUTCOME

Understand the features of Distributed Multimedia Systrems and Hybermedia