CS8092 COMPUTER GRAPHICS AND MULTIMEDIA L T P C   3 0 0 3

OBJECTIVES:

- To develop an understanding and awareness 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.
- To become familiar with various software programs used in the creation and implementation of multi- media
- To appreciate the importance of technical ability and creativity within design practice.
- To gain knowledge about graphics hardware devices and software used.
- To understand the two-dimensional graphics and their transformations.
- To understand the three-dimensional graphics and their transformations.
- To appreciate illumination and color models
- To become familiar with understand clipping techniques
- To become familiar with Blender Graphics

UNIT I ILLUMINATION AND COLOR MODELS   9

Light sources - basic illumination models – halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts - RGB colour model - YIQ colour model - CMY colour model - HSV colour model - HLS colour model; Colour selection. Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II TWO-DIMENSIONAL GRAPHICS 9

Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing – viewing pipeline, viewing coordinate reference frame; window-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

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UNIT III THREE-DIMENSIONAL GRAPHICS 9

Three dimensional concepts; Three dimensional object representations – Polygon surfacesPolygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations – Bezier curves and surfaces -B-Spline curves and surfaces. TRANSFORMATION AND VIEWING: Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

UNIT IV MULTIMEDIA SYSTEM DESIGN & MULTIMEDIA FILE HANDLING9

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

UNIT V HYPERMEDIA 9

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. CASE STUDY: BLENDER GRAPHICS Blender Fundamentals – Drawing Basic Shapes – Modelling – Shading & Textures   **TOTAL: 45 PERIODS**

OUTCOMES:

- At the end of the course, the students should be able to:
- Design two dimensional graphics.
- Apply two dimensional transformations.
- Design three dimensional graphics.
- Apply three dimensional transformations.
- Apply Illumination and color models.
- Apply clipping techniques to graphics.

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- Understood Different types of Multimedia File Format
- Design Basic 3d Scenes using Blender

TEXT BOOKS:

1. Donald Hearn and Pauline Baker M, ―Computer Graphics", Prentice Hall, New Delhi, 2007 [UNIT I – III]

2. Andleigh, P. K and KiranThakrar, ―Multimedia Systems and Design‖, PHI, 2003. [UNIT IV,V]

REFERENCES:

1. Judith Jeffcoate, ―Multimedia in practice: Technology and Applications‖, PHI, 1998.

2. Foley, Vandam, Feiner and Hughes, ―Computer Graphics: Principles and Practice‖, 2nd Edition, Pearson Education, 2003.

3. Jeffrey McConnell, ―Computer Graphics: Theory into Practice‖, Jones and Bartlett Publishers,2006.

4. Hill F S Jr., "Computer Graphics", Maxwell Macmillan , 1990.

5. Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, KelvinSung, and AK Peters, ―Fundamentals of Computer Graphics‖, CRC Press, 2010.

6. William M. Newman and Robert F.Sproull, ―Principles of Interactive Computer Graphics‖ McGraw Hill 1978.

https://www.blender.org/support/tutorials/

CS8092 COMPUTER GRAPHICS AND MULTIMEDIA

UNIT I

ILLUMINATION AND COLOR MODELS

Light sources - basic illumination models – halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts - RGB colour model - YIQ colour model - CMY colour model - HSV colour model - HLS colour model; Colour selection. Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

PART-A

1. State the difference between CMY and HSV color models.(Nov/Dec 2012)(U)

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 is to be added to obtain different shades, tint, and tones. A color model defined with the primary colors cyan, magenta, and yellow is useful for describing color output to hard-copy devices.

2. What are subtractive colors?(may/june 2012)(R)

RGB model is an additive system, the Cyan-Magenta-Yellow (CMY) model is a subtractive color model. In a subtractive model, the more that an element is added, the more that it subtracts from white. So, if none of these are present the result is white, and when all are fully present the result is black.

3. Define YIQ color model (R)

In the YIQ color model, luminance (brightness) information in contained in the Y parameter, chromaticity information (hue and purity) is contained into the I and Q parameters. A combination of red, green and blue intensities are chosen for the Y parameter to yield the standard luminosity curve. Since Y contains the luminance information, black and white TV monitors use only the Y signal.

4. What do you mean by shading of objects?(nov/dec 2011) (R)

A shading model dictates how light is scattered or reflected from a surface. The shading models described here focuses on achromatic light. Achromatic light has brightness and no color; it is a shade of gray so it is described by a single value its intensity. A shading model uses two types of light source to illuminate the objects in a scene : point light sources and ambient light.

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5. What is texture?(nov/dec 2011)(R)

The realism of an image is greatly enhanced by adding surface texture to various faces of a mesh object. The basic technique begins with some texture function, texture(s,t) in texture space , which has two parameters s and t. The function texture(s,t) produces a color or intensity value for each value of s and t between 0(dark)and 1(light).

6. What are the types of reflection of incident light?(nov/dec 2013) (R)

There are two different types of reflection of incident light

- Diffuse scattering.
- Specular reflections.

7. Define rendering (may/june 2013) (R)

Rendering is the process of generating an image from a model (or models in what collectively could be called a scenefile), by means of computer programs. Also, the results of such a model can be called a rendering.

8. Differentiate flat and smooth shading (may/june 2013) (U)

The main distinction is between a shading method that accentuates the individual polygons (flat shading) and a method that blends the faces to de-emphasize the edges between them (smooth shading).

9. Define shading (may/june 2012) (R)

Shading is a process used in drawing for depicting levels of darkness on paper by applying media moredensely or with a darker shade for darker areas, and less densely or with a lighter shade for lighter areas.

10. What is a shadow? (nov/dec 2012) (R)

Shadows make an image more realistic. The way one object casts a shadow on another object gives important visual clues as to how the two objects are positioned with respect to each other. Shadows conveys lot of information as such, you are getting a second look at the object from the view point of the light source.

11. What are two methods for computing shadows? (R)

- Shadows as Texture.
- Creating shadows with the use of a shadow buffer.

12. Write any two Drawbacks of Phong Shading (R)

- Relatively slow in speed.

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- More computation is required per pixel.

13. What are the two common sources of textures? (R)

- Bitmap Textures.
- Procedural Textures.

14. Write two types of smooth shading. (R)

- Gouraud shading.
- Phong shading.

15. What is a color model? (R)

A color model is a method for explaining the properties or behavior of color within some particular context. **Example**: XYZ model, RGB model.

16. Define intensity of light.(R)

Intensity is the radiant energy emitted per unit time, per unit solid angle, and per unit projected area of source.

17. What is hue? (R)

The perceived light has a dominant frequency (or dominant wavelength). The dominant frequency is also called as hue or simply as color.

18. What is purity of light? (R)

Purity describes how washed out or how "pure" the color of the light appears. pastels and pale colors aredescribed as less pure.

19. Define the term chromacity. (R)

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

20. How is the color of an object determined? (U)

When white light is incident upon an object, some frequencies are reflected and some are absorbed by the object. The combination of frequencies present in the reflected light determines what we perceive as the color of the object.

21. Define purity or saturation.(R)

Purity describes how washed out or how "pure" the color of the light appears.

22. Define complementary colors. (R)

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If the two color sources combine to produce white light, they are referred to as 'complementary colors. Examples of complementary color pairs are red and cyan, green and magenta, and blue and yellow.

23. Define primary colors. (R)

The two or three colors used to produce other colors in a color model are referred to as primary colors.

24. State the use of chromaticity diagram. (U)

- Comparing color gamuts for different sets of primaries.
- Identifying complementary colors.
- Determining dominant wavelength and purity of a given color.

25. What is Color Look up table?(R)

In color displays, 24 bits per pixel are commonly used, where 8 bits represent 256 level for each color. It is necessary to read 24- bit for each pixel from frame buffer. This is very time consuming. To avoid this video controller uses look up table to store many entries to pixel values in RGB format. This look up table is commonly known as colour table.

26. What is the use of hidden line removing algorithm? (R)

The hidden line removal algorithm determines the lines, edges, surfaces or volumes that are visible or invisible to an observer located at a specific point in space.

27. What are subtractive colors? November /December 2020/April/May 2021

28. What are the types of reflection of incident light? November /December 2020/April/May 2021

PART – B

1. Explain in detail about XYZ color model.**(R)**

2. Explain in detail about RGB color model.**(R)**

3. Explain in detail about YIQ color model.**(R)**

4. Explain in detail about CMY color model.**(R)**

5. Explain in detail about HSV color model.**(R)**

6. Compare and contrast RGB and CMY.**(U)**

7. Explain in detail about the conversion between HSV and RGB color models.**(R)**

8. Explain in detail about HLS color model.**(R)**

9. Explain in detail about shading models.**(R)**

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10. Explain line drawing algorithm. **(R)**

11. Explain circle and generating algorithm. **(R)**

12. Explain ellipse drawing algorithm.**(R)**

13. Explain Pixel addressing and object geometry.**(R)**

14. Explain filled area primitives.**(R)**

15. Explain about shading and graphics pipeline.**(R)**

16. Derive the decision parameters for midpoint line drawing algorithm . NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

17. (ii) Digitize the line with endpoints (20, 10) and (30, 10) using Bresenham's line drawing algorithm. NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

18. Write the procedure Sutherland-Hodgeman polygon clipping algorithm by taking an example. NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

UNIT II   TWO-DIMENSIONAL GRAPHICS

Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing – viewing pipeline, viewing coordinate reference frame; window-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

PART - A

1. What is Transformation? (R)

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

2. Write short notes on active and passive transformations. (R)

In the active transformation the points x and y represent different coordinates of the same coordinate system.Here all the points are acted upon by the same transformation and hence the shape of the object is not distorted.In a passive transformation the points x and y represent same points in the space but in a different coordinatesystem. Here the change in the coordinates is merely due to the change in the type of the user coordinate system.

3. What is translation? (R) NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

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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 undergo a displacement to (x´,y´). the transformation is:

x´ = x + tx

y´ = y+ty

4. What is rotation? (R)

A 2-D rotation is done by repositioning the coordinates along a circular path, in

X = rcos (q + f) and Y = r sin (q + f).

5. What is scaling? (R) NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

The scaling transformations changes the shape of an object and can be carried out by multiplying each vertex (x,y) by scaling factor Sx,Sy where Sx is the scaling factor of x andSy is the scaling factor of y.

6. What is shearing? (R)

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.

7. What is reflection? (R)

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

8. Distinguish between window port & view port? (U)

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.

9. Define clipping? And types of clipping. (R)

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

- Point clipping
- Line clipping
- Area clipping
- Curve clipping
- Text clipping

10. What is covering (exterior clipping)? (R)

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This is just opposite to clipping. This removes the lines coming inside the windows and displays the remaining. Covering is mainly used to make labels on the complex pictures.

11. What is the need of homogeneous coordinates? (R)

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

12. Distinguish between uniform scaling and differential scaling. (U)

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. .

13. What is fixed point scaling? (R)

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. .

14. Define Affine transformation. (R)

A coordinate transformation of the form X= axxx +axyy+bx, y "ayxx+ayyy+by is called a two-dimensional affine transformation. Each of the transformed coordinates x „and y „is a linear function of the original coordinates x and y, and parameters aij and bk are constants determined by the transformation type.

15. Distinguish between bitBlt and pixBlt. (R)

Raster functions that manipulate rectangular pixel arrays are generally referred to as raster ops. Moving a block of pixels from one location to another is also called a block transfer of pixel values. On a bilevel system, this operation is called a bitBlt (bit-block transfer), on multilevel system t is called pixBlt.

16. List out the various Text clipping. (U)

- All-or-none string clipping -if all of the string is inside a clip window, keep it otherwise discards.
- All-or-none character clipping – discard only those characters that are not completely inside the window. Any character that either overlaps or is outside a window boundary is clipped.
- Individual characters – if an individual character overlaps a clip window boundary, clip off the parts of the character that are outside the window.

17. What is fixed point scaling? (R)

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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.

18. Write down the shear transformation matrix. (nov/dec 2012) (R)

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 is called a shear.

20. What is the use of clipping?(may/june 2012) (R)

Clipping in computer graphics is to remove objects, lines or line segments that are outside the viewing volume.

21. How will you clip a point?(may/june 2013) (U)

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:

xwmin ≤ x≤ xwmaxywmin ≤ y≤ ywmax

where the edges of the clip window (xwmin ,xwmax, ywmin, ywmax) can be either the world-coordinate window boundaries or viewport boundaries. If any one of these inequalities is not satisfied, the points are clipped (not saved for display).

22. Define viewing transformation.(R)

The mapping of a part of world coordinate scene to device coordinates are called viewing transformation. Two dimensional viewing transformation is simply referred to as window to viewport transformation or the windowing transformation.

PART – B

1. Explain reflection and shear?(R)

2. Explain Liang Barsky line clipping? (R)

3. Explain Sutherland Hodgeman polygon clipping(R)

4. Explain about clipping operations(R)

5. Explain in detail about window to viewport coordinate transformation.(R)

6. Write a detailed note on the basic two dimensional transformations.(R)

7. Explain with an example the Cohen-Sutherland line clipping algorithm.(R)

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8. Compare Cohen-Sutherland line clipping algorithm and Liang-Barsky line clipping algorithm. Write note on any one polygon clipping algorithm**.(U)**

9. (i) Derive the general 3D rotation matrix with respect to an axis not parallel to any of the coordinate axes. NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

   (ii) Discuss the three dimensional object representations in detail.

10. Discuss in detail on Bezier curves and Bezier surfaces NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

UNIT IIITHREE-DIMENSIONAL GRAPHICS

Three dimensional concepts; Three dimensional object representations – Polygon surfaces-Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations – Bezier curves and surfaces -B-Spline curves and surfaces. TRANSFORMATION AND VIEWING: Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

PART - A

1. What are the various representation schemes used in three dimensional objects? (R)

- Boundary representation (B-res) – describe the 3 dimensional object as a set of surfaces that separate the object interior from the environment.
- Space-portioning representation – describe interior properties, by partitioning the spatial region containing an object into a set of small, no overlapping, contiguous solids.

2. What is Polygon mesh?(R)

Polygon mesh is a method to represent the polygon, when the object surfaces are tiled, it is more convenient to specify the surface facets with a mesh function. The various meshes are

- Triangle strip – (n-2) connected triangles
- Quadrilateral mesh – generates (n-1)(m-1) Quadrilateral

3. What is Bezier Basis Function?(R)

Bezier Basis functions are a set of polynomials, which can be used instead of the primitive polynomial basis, and have some useful properties for interactive curve design.

4. What is surface patch?(R)

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A single surface element can be defined as the surface traced out as two parameters (u, v) take all possible values between 0 and 1 in a two-parameter representation. Such a single surface element is known as a surface patch.

5. Write short notes on rendering bi-cubic surface patches of constant u and v method. (R)

The simple way is to draw the iso-parmetric lines of the surface. Discrete approximations to curves on the surfaceare produced by holding one parameter constant and allowing the other to vary at discrete intervals over its wholerange. This produce curves of constant u and constant v.

6. What are the advantages of rendering polygons by scan line method?(R)

- The max and min values of the scan were easily found.
- The intersection of scan lines with edges is easily calculated by a simple incremental method.
- The depth of the polygon at each pixel is easily calculated by an incremental method.

7. What are the advantages of rendering by patch splitting? (R)

- It is fast-especially on workstations with a hardware polygon-rendering pipeline.
- It's speed can be varied by altering the depth of sub-division.

8. Define B-Spline curve.(R) NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

A B-Spline curve is a set of piecewise(usually cubic) polynomial segments that pass close to a set of control points. However the curve does not pass through these control points, it only passes close to them.

9. What is a spline? (R) NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

To produce a smooth curve through a designed set of points, a flexible strip called spline is used. Such a spline curve can be mathematically described with a piecewise cubic polynomial function whose first and second derivatives are continuous across various curve section.

10. What is the use of control points? (R)

Spline curve can be specified by giving a set of coordinate positions called control points, which indicates the general shape of the curve, can specify spline curve.

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

- 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 specifyingcombination of geometric constraints on the curve.

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12. What are the important properties of Bezier Curve? (R)

- It needs only four control points
- It always passes through the first and last control points
- The curve lies entirely within the convex half formed by four control points.

13. Differentiate between interpolation spline and approximation spline.(U)

When the spline curve passes through all the control points then it is called interpolate. When the curve is notpassing through all the control points then that curve is called approximation spline.

14. What do you mean by parabolic splines? (R)

For parabolic splines a parabola is fitted through the first three points p1,p2,p3 of the data array of k points. Then a second parabolic arc is found to fit the sequence of points p2, p3, p4. This continues in this way until a parabolic arc is found to fit through points pn-2, pn-1 and pn. The final plotted curve is a meshing together of all these parabolic arcs.

15. What is cubic spline? (R)

Cubic splines are a straight forward extension of the concepts underlying parabolic spline. The total curve in this case is a sequence of arcs of cubic rather than parabolic curves. Each cubic satisfies :ax+ bx + cx + d

16. What is a Blobby object? (R)

Some objects do not maintain a fixed shape, but change their surface characteristics in certain motions or when in proximity to other objects. That is known as blobby objects. Example – molecular structures, water droplets.

17. Define Octrees. (R)

Hierarchical tree structures called octrees, are used to represent solid objects in some graphics systems. Medical imaging and other applications that require displays of object cross sections commonly use octree representation.

18. Define Projection. (R)

The process of displaying 3D into a 2D display unit is known as projection. The projection transforms 3D objects into a 2D projection plane. The process of converting the description of objects from world coordinates to viewing coordinates is known as projection

19. What are the steps involved in 3D transformation? (R)

- Modeling Transformation
- Viewing Transformation

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- Projection Transformation
- Workstation Transformation

20. What do you mean by view plane? (R)

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

21. What is view-plane normal vector?(R)

This normal vector is the direction perpendicular to the view plane and it is called as [DXN DYN DZN]

22. What is view distance? (R)

The view plane normal vector is a directed line segment from the view plane to the view reference point. The length of this directed line segment is referred to as view distance.

23. Mention some surface detection methods.(U)

Back-face detection, depth-buffer method, A-buffer method, scan-line method, depth-sorting method, BSP-tree method, area subdivision, octree method, ray casting.

24. What you mean by parallel projection?(R)

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.

25. What do you mean by Perspective projection?(R)

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.

26. What is Projection reference point?(R)

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

27. What is the use of Projection reference point?(R)

In Perspective projection, the object positions are transformed to the view plane along these converged projection line and the projected view of an object is determined by calculating the intersection of the converged projection lines with the view plane.

28. What are the different types of parallel projections?(R)

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The parallel projections are basically categorized into two types, depending on the relation between the direction of projection and the normal to the view plane. They are orthographic parallel projection and oblique projection.

29. What is orthographic parallel projection?(R)

When the direction of the projection is normal (perpendicular) to the view plane then the projection is known asorthographic parallel projection

30. What is orthographic oblique projection?(R)

When the direction of the projection is not normal (not perpendicular) to the view plane then the projection is known as oblique projection.

31. What is an axonometric orthographic projection?(R)

The orthographic projection can display more than one face of an object. Such an orthographic projection is called axonometric orthographic projection.

32. What is cavalier projection?(R)

The cavalier projection is one type of oblique projection, in which the direction of projection makes a 45-degree angle with the view plane.

33. What is cabinet projection?(R)

The cabinet projection is one type of oblique projection, in which the direction of projection makes a n angle of arctan (2)=63.4- with the view plane.

34. What is vanishing point?(R)

The perspective projections of any set of parallel lines that are not parallel to the projection plane converge to appoint known as vanishing point.

35. What do you mean by principle vanishing point.(R)

The vanishing point of any set of lines that are parallel to one of the three principle axes of an object is referred to as a principle vanishing point or axis vanishing point.

36. What is view reference point? (R)

The view reference point is the center of the viewing coordinate system. It is often chosen to be close to or on the surface of the some object in the scene.

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PART-B

1. Explain spline representation.**(R)**
2. Explain about polygon surfaces**(R)**
3. Explain Bezier curves and its properties.**(R)**
4. Explain Back face detection method and Depth buffer method**(R)**
5. Explain area subdivision and A- Buffer method**(R)**
6. Explain about the basic transformations performed on three dimensional objects.**(R)**
7. Explain in detail about three dimensional display methods.**(R)**
8. Explain in detail about the boundary representation of three dimensional objects.**(R)**
9. Explain in detail about 3D window to viewport coordinate transformation.**(R)**

UNIT IVMULTIMEDIA SYSTEM DESIGN & MULTIMEDIA FILE HANDLING

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

PART A

1. Define Multimedia and Give the applications of Multimedia?(NOV/DEC 2016)? (R)
NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

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.

- Document Imaging
- Image Processing and Image Recognition
- Full Motion Digital Video Applications
- Electronic messaging
- Entertainment
- Corporate Communications

2. What are the data elements of Multimedia? (R) (NOV/DEC 2015), (MAY/JUNE 2016)
NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

- Facsimile
- Document Images
- Photographic Images
- Geographic Information System Maps (GIS)

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- Voice Commands and Voice Synthesis
- Audio Messages
- Video Messages
- Full motion stored and Live Video
- Holographic Images
- Fractals

3. State the resolution and the compression technique of Facsimile, Document Images and Photographic Images? (R)

Resolution:

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

Compression Technique

- Facsimile - CCITT Group3
- Document Images - CCITT Group4

4. Explain about GIS Systems and two technologies used for storage and display of GIS systems? (R) (NOV/DEC 2017)

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

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

5. Explain about Full motion and live video? (U)

- 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)

6. Explain the terms Holography and Hologram? (U)

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.

7. State the use and properties of Holographic images? (R)

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

Properties: 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.

8. Define Fractals and Fractal Compression? (R)

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.

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

9. Define Compression Efficiency? (R)

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

10. What is Image Processing and Image Calibration? (R)

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

11. What is Gray scale Normalization? (R)

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

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12. What is Frame Averaging? (R)

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

13. How Image Annotation is done? (An) (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.

14. Explain Optical Character Recognition (U) (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

15. What is Vector Data and Define Vectorisation? (R)

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.

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

16. What are the properties of Full-motion video clip? (R)

- 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

17. Explain the infrastructure required by a multimedia enabled E-mail system? (U)

- Message store and forward facility

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- 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

18. State the applications of Non-Textual Image Recognition? (U)

- Recognition of human faces
- Interpretation of facial expressions
- Designing, Manufacturing and Medical fields
- Security systems

19. What is meant by Multimedia database? (R) (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.

20. What is the use of Document Imaging Application? (R) (MAY/JUN 2018)

Document imaging is an information technology category for systems capable of replicating documents commonly used in business. Document Imaging means the conversion of paper files (of any size or description) or microfilm / fiche to digital images.

21. What is Image Compression, the need for Compression and types of compression? (R)

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

- Lossy Compression
- Lossless Compression

22. What isLossy Compression and Lossless Compression? (R) (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, gray scale or color images

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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

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 gray scale images.

23. What are the advantages of Compression? (R)

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

24. State the types of Lossy and losless Compression? (R)

LossyCompression	losless Compression
JPEG (Joint Photographic Experts Group)	Pack bits Encoding
MPEG (Moving Picture Experts Group)	CCITT Group3 1D
Intel DVI (Digital Video Interface)	CCITT Group3 2D
CCITT H.261(P*64)	CCITT Group 4
Fractal	Lempel-Ziv and Welch Algorithm (LZW) CCITT

25. What is A Binary Image? (R)

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

26. What is Cadecs and Cadence? (R)

Compression and decompression software or programs are called Cadecs.

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.

27. Explain about Busy Image and Continuous-tone Images? (R)

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

28. What is Negative or Reverse Compression? (R)

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

29. Give some applications of compression and Decompression Techniques? (U)

- Facsimile Systems
- Printer Systems
- Document Storage and Retrieval Systems
- Video Teleconferencing Systems
- Electronic Multimedia Messaging Systems
- Medical Screening Systems

30. Explain Magnetic Media Technology? (U)

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.

31. Explain ST506 and MFM hard drives? (U)

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).

32. What is MFM, ESDI hard drive, IDE, SCSI and SCSI 1? (R)

- MFM means Modified Frequency Modulation. Parallel data is converted to a series of encoded pulse by MFM.
- 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.
- 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.
- SCSI means Small Computer System Interface. It was developed by X3T9.2 Standard. It defines both hardware and software interfaces.
- 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.

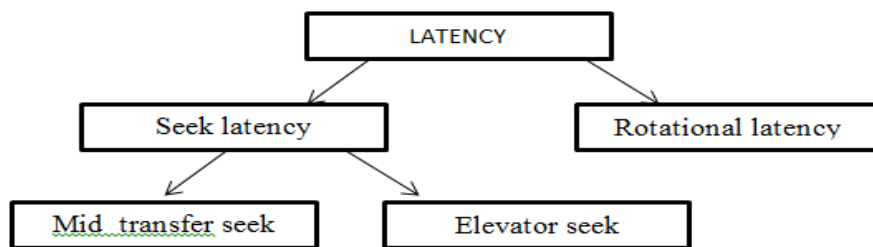### 33. State the different phases of a SCSI bus and its uses? (U)

- Arbitration phase - an initiator starts arbitration and tries to acquire the bus

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- 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

34. Explain SCSI 2? (U)

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.

35. State the two types of latency? (U)

36. What is Overlapped seek, Mid transfer seek, elevator seek? (R)

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

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

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

37. State the two methods used to reduce latency? (R)

- Zero latency read/write
- Interleave factor

38. Define Transfer rate? (R)

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

39. Give the formula for maximum throughput? (E)

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

40. Define I/O per second? (R)

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

41. What is Command Queuing? (R)

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

42. Define Disk spanning? (R)

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.

43. Explain RAID and types of RAID systems? (NOV/DEC 2016) (R)

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. The types are

- 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

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44. What are the key objectives of RAID systems? (R)

- Hot backup of disk systems
- Large volume storage at lower cost
- Higher performance at lower cost
- Ease of data recovery

45. State some applications of RAID systems? (R)

•   Mainframe and N/w systems

•   Super computers and Multimedia systems

•   Data server applications

46. What is Disk Striping and Disk Mirroring? (R)

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.

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.

47. Explain On-the-fly parity generation and parity checking? (U)

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.

48. Explain Sector Interleaving and Block Interleaving? (U)

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.

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.

49. What is the use of Optical Media and How Optical media is classified? (An)

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. Optical media can be classified as follows

- CROM - Compact Disc Read Only Memory
- WORM - Write Once Read Many
- Rewriteable
- Multifunction

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

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.

51. Compare the characteristics of lossy and lossless compression techniques?(APR/MAY 2018) (An)

Lossy Compression	Lossless Compression
1. The technique involves some loss of information.	1. Involves no loss of information.
2. Data that has been compressed using this technique can't be recovered and reconstructed exactly.	2. If data has been (lossless) compressed, the original data can be recovered from the compressed data.
3. Used for application that can tolerate difference between the original and reconstructed data.	3. Used for application that can't tolerate any difference between original and reconstructed data.
4. In return for accepting this distortion in reconstructed data we obtain high compression rate	4. No loss in information so compression rate is small.
5. Sound and Image compression uses lossy compression.	5. Text compression uses lossless compression
6. More data can be accommodated in channel.	6. Less data can be accommodated in channel.

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Lossy Compression	**Lossless Compression**
7. Distortion	7. Distortion less

52. What are the properties of Full-motion video clip? (R) (APR/MAY 2018)

A full motion video (FMV) is a video game narration technique that relies upon pre-recorded video files (rather than sprites, vectors, or 3D models) to display action in the game. While many games feature FMVs as a way to present information during cut scenes, games that are primarily presented through FMVs are referred to as full-motion video games or interactive movies.

PART-B

1. Explain list of Multimedia applications. Explain them briefly. (R)
2. Write short notes on multimedia system architecture. (8) (NOV/DEC '15) (NOV/DEC'17)
3. What is multimedia? Explain the properties of multimedia systems. (R)
4. Explain the different file formats used in multimedia. (May/June2016), (NOV/DEC 2016) (R)
5. Explain various multimedia interface standards. (8) (NOV/DEC 2015) (APR/MAY 2018) (R) NOVEMBER /DECEMBER 2020/APRIL/MAY 2021
6. Describe various building block of multimedia system. (R)
7. Explain Database Organization for Multimedia Applications. (R)
8. (i) Explain hypermedia and its functions.   (8)
   (ii) Short notes on Multimedia databases.   (8) (NOV/DEC 2016) (R)
9. Write brief notes on multimedia storage and retrieval? (8) (DEC '15) (R)
10. Explain in detail about full motion digital video applications? (NOV/DEC2015)
11. Write about the use of Full-motion Video in Multimedia applications.(8)(May/June2016)
12. Write about Multimedia System Architecture (8)(May/June2016) (APR/MAY 2018) (R) NOVEMBER /DECEMBER 2020/APRIL/MAY 2021
13. Write about the data types of Multimedia Systems. (May/June2016) (R)
14. Write briefly on multimedia object management? (NOV/DEC 2017) (R)
15. Define MIDI. List its attribute. Compare and contrast the use of MIDI and digitized audio in multimedia production. (NOV/DEC 2016) (R)
16. Explain multimedia input and output Technologies.(8)(NOV/DEC 2015)(R)
17. Discuss briefly about image compression schemes? (8) (NOV/DEC 2015)(An) NOVEMBER /DECEMBER 2020/APRIL/MAY 2021
18. Explain in detail about types of voice recognition system? (8)(NOV/DEC 2015)(R)
19. Explain in detail about TIFF implementation issues? (8)(NOV/DEC 2015),(NOV/DEC 2016)(R) (APR/MAY 2018)

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20. Explain about MPEG Compression (16)(May/June 2016)(R) NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

21. Classify the requirements and challenges in Multimedia Databases NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

22. Discuss about evolving technologies for multimedia systems NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

23. Explain in detail about RAID technology for storage for multimedia Systems (16)(May/June 2016)(R)

24. Explain about digital audio and voice in multimedia i/o technologies?(R) (APR/MAY 2018)

25. Explain the CCITT group of compression standards in detail. (R) (APR/MAY 2018)

26. Explain CGA in detail (R) (NOV/DEC 2017)

27. What are the controls signals that define the activity phases of SCSI bus? (R) (NOV/DEC 2017)

28. Explain in detail the components of the TWAIN architecture NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

29. Explain the TIFF file format in detail NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

30.

a) (i) Describe the CCITT group 3 standard. How does CCITT group 4 differ from CCITT group 3?   7

(ii) Given the following portion from a block (assumed to be 4x4 pixels to simplify the problem) from an image after the Discrete Cosine transform stage of the compression pipeline has been applied   8

128	32	64	160
32	16	12	32
128	64	46	128
4	31	40	32

1. What is the result of the quantization step of the MPEG video compression method assuming that a constant quantization vale of 32 is used?

2. What is the result of the following zig-zag step being applied to the above quantized block?

31. Discuss the various design issues and the types of multimedia authoring systems in detail NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

32. Explain in detail the various applications that make use of virtual reality NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

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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. CASE
STUDY: BLENDER GRAPHICS Blender Fundamentals – Drawing Basic Shapes – Modelling –
Shading & Textures.

PART A

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

- Recognition of human faces
- Interpretation of facial expressions
- Designing, Manufacturing and Medical fields
- Security systems

2.   What is Hypermedia? (R) (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? (R)

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? (R)

Multimedia PC is a computer that has a CD-ROM or DVD drive and supports8-bitand
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? (R)

Multimedia improves information relation. Multimedia applications includes the following:

- Business
- Schools
- Home

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6.   What is meant by Multimedia User Interface? (R)

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

7. Define Virtual Reality Systems? (R)

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? (U)

- Human factors
- Multimedia Inputs and Outputs
- Virtual Reality Modeling
- Virtual Reality Design considerations

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

- Color, Brightness and Shading
- Object Recognition
- Navigation
- Motion Processing
- Depth Processing
- Lag aces and Shared Execution Environment
- Business Process Workflow Applications

10. Explain about Cable convertor? (U)

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? (R)

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? (U)

- Dedicated Systems
- Departmental Systems

13. What is Depth Perception? (R)

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

14. Explain about Pictorial Clues? (U)

- Pictorial Clues consist of
- Changes in shapes and sizes
- Changes in gradient of surfaces
- Changes in density of objects
- Field of vision
- Change in brightness and light reflection from object surfaces

15. Define Lag? (R)

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

- Location of multimedia object server
- Network bandwidth
- Capability of workstation to process multiple streams concurrently

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

- Simulation Loops
- Multiple Processes
- Concurrent Objects

17. What is Simulation loop? (R) (APR/MAY 2018)

A set of objects such as sound clips, video clips, graphics and sensory stimuli participate in simulation. A procedure is created and time step 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? (R) (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.

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19. What are the design issues in Gesture recognition? (R) (APR/MAY 2018)

- Start and end of gesture
- Path recognition and velocity of movement
- Combination effects of multiple related gestures
- Environmental context in which the gesture was performed

20. State the User Interface design tools? (U)

Media Editors

- Authoring Application
- Hypermedia Object Creation
- Multimedia Object Locator and Browser

21. What is navigation? (R)

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? (R)

1. Organizer Metaphor

2. Telephone metaphor

3. Aural User Interface(AUI)

4. VCR Metaphor

23. Explain Organizer metaphor? (U)

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? (R)

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? (R)

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.

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26. Define Mobile Messaging? (R) (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? (R)

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 Rubber Banding? (R)

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.

29. What is Frame Interleaving? (R)

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

30. What is 1:1 interleaving? (R)

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

31. What is programmed degradation? (R)

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.

32. What is the use of Planar Imaging Technique? (R)

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.

33. Explain user workstation? (U)

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.

34. What is the use of Gateway nodes? (R)

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

35. What is the use of Database server? (R)

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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.

36. What is the use of Voice mail server? (R)

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

37. What is the use of Audio Server? (R)

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

38. Explain about the Video Server? (R)

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

39. What is the use of Audio/Video Duplication? (R)

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

40. What is the use of Duplication station? (R)

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

41. List any 2 factor for a good hypermedia design NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

 Essential for good hypermedia design:
 1.Determining the type of hypermedia application.
 2.Structuring the information.
 3.Determining the navigation

42. Modeling primitives are important for structuring the information. Justify and list two of them. NOVEMBER /DECEMBER 2020/APRIL/MAY 2021

 Primitive based: It is based on the notion that a physical object can be divided into a set of primitives – basic elements or shapes that can be combined in a certain order following a set of rules (Boolean operations) to create the object

PART-B

1. Distinguish between multimedia system and hypermedia system.(R)

2. List the main attribute, benefits and drawbacks of 3 types of authoring systems. (R)

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3. Write short notes on following. **(R)**
    a. a. Mobile messaging.
    b. b. Document management.

4. Explain time based and object oriented multimedia authoring tool**.(R)**

5. Briefly explain integrated document management in multimedia**.(NOV/DEC 2015)(R)**

6. How to create hypermedia message? Give an example also explain hypermedia message components.(**NOV/DEC 2016)(R)**

7. Explain about mass storage for multimedia servers?**(R) (May/June2018)**

8. Explain the components of Distributed multimedia Systems. **(NOV/DEC 2015)(R) (May/June2016)**

9. Explain multimedia Authoring and User Interface design. **(May/June2016)(NOV/DEC 2016) (May/June2018)(R)**

10. Explain the types of multimedia authoring systems?**(NOV/DEC 2015)(May/June2016)(R)**

11. Describe the term Hypermedia and applications? **(NOV/DEC 2015)(May/June2016)(R)**

12. i)Describe the common forms of navigation for information access.**(NOV/DEC 2016)**
    ii) Explain any two components of a typical multimedia application environment **(NOV/DEC 2016) (R)**

13. Explain about key issues of data organization for multimedia systems **(May/June 2016)(R)**

14. Describe full motion video Authoring system? **(NOV/DEC 2017) (R)**

15. Explain the process of creating Hypermedia messages? **(NOV/DEC 2017) (R)**

16. Discuss the MAPI architecture in detail? **(NOV/DEC 2017) (R)**

17. Write about Application software? **(NOV/DEC 2017) (R)**

18. CASE STUDY: BLENDER GRAPHICS(**A)**

COURSE OUTCOMES

Course Name   **:** CS8092-COMPUTER GRAPHICS AND MULTIMEDIA

Year/Semester   **:** III / VI

Year of Study   **:** 2021-2022(R – 2017)

On Completion of this course student will be able to

CO	OUTCOMES
CO1	Design two dimensional graphics.
CO2	Apply two dimensional transformations
CO3	Design three dimensional graphics.
CO4	Apply three dimensional transformations.
CO5	Apply Illumination and color models.
CO6	Apply clipping techniques to graphics.
CO7	Understood Different types of Multimedia File Format
CO8	Design Basic 3d Scenes using Blender

CO – PO MATRIX:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	3	-	2	-	-	-	-	-	-	-
CO2	3	-	3	-	2	-	-	-	-	-	-	-
CO3	3	-	3	-	2	-	-	-	-	-	-	-
CO4	3	-	3	-	2	-	-	-	-	-	-	-
CO5	3	-	3	-	2	-	-	-	-	-	-	-
CO6	3	-	3	-	2	-	-	-	-	-	-	-
CO7	3	-	3	-	2	-	-	-	-	-	-	-
CO8	3	-	3	-	2	-	-	-	-	-	-	-
AVG	3	-	3	-	2	-	-	-	-	-	-	-

III Year / VI Sem / 2021-2022 (Even)

COURSE OUTCOMES AND PROGRAM SPECIFIC OUTCOMES MAPPING

CO	PSO1	PSO2	PSO3
CO1	3	3	-
CO2	3	3	-
CO3	3	3	-
CO4	3	3	-
CO5	3	3	-
CO6	3	3	-
CO7	3	3	-
CO8	3	3	-
AVG	3	3	-

III Year / VI Sem / 2021-2022 (Even)