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Computer Graphics (SAZ4C) IInd BCA 'A'

2 - Marks

1. What are the application areas of computer Graphics?
   Computer graphics are used in areas such as, science, engineering, medicine, business, industry, government, art , entertainment, advertising, education, and training.

2. Define scientific visualization.
   Producing graphical representation for scientific, engineering, and medical data sets and processes is referred as scientific visualization.

3. What is graphical user interface?
   It is a Window manager that allows a user to display multiple-Window area.

4. Write the two techniques to produce color in CRT.
   Two techniques to produce color in CRT are:
   1) Beam – penetration method
   2) Shadow – mask

5. List out the video display devices.
   Video display devices are:
   1) Cathode Ray Tube (CRT)
   2) Raster-scan displays
   3) Random-scan displays
   4) Color CRT monitors
   5) Flat-panel displays

6. What is meant by resolution?
   The maximum number of points that can be displayed without overlap on a CRT is referred to as the resolution.

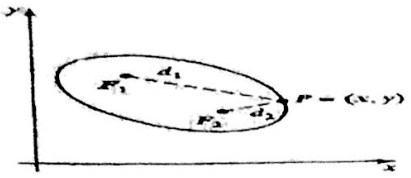
7. What is pixel?
   Pixel is shortened forms of picture element. Each screen point is referred to as pixel or pel.

8. What is persistence?
   Persistence is the time to which the phosphors in the cathode Ray Tubes emit light until the next electrons is fired. It is actually a measure of time taken by the emitted light from screen to decay one tenth of its original intensity. Lower persistence phosphors require higher refreshing rate to avoid flickering. Lower persistence phosphors are usually used for animations. Higher persistence phosphors are used to display complex images.

9. What is pixmap?
   For systems with multiple bits per pixel, the frame buffer is often referred to as a pixmap.
10. Define bitmap
    The frame buffer used in the black and white system is known as bitmap which take one bit per pixel.

11. List properties of Ellipses.

Given two fixed positions F1 and F2 the sum of the two distances from these points to any point P on the ellipse (d_1+d_2) is constant.



12. What are line attributes?

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

13. Define the term viewport.

The display area of the part selected or the form in which the selected part is viewed is known as view port.

14. Write down the classifications for Graphics software.

The classifications for Graphics software are:

1) General programming packages
2) Special-purpose applications packages.

15. What are character attributes?

The appearances of displayed characters are 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.

16. Write any two types of printers.

The two types of printers are: impact and non-impact printers.

Impact printer press formed character faces against an inked ribbon on to the paper. A line printer and dot-matrix printer are examples.

Non-impact printer and plotters use Laser techniques, inkjet sprays, Xerographic process, electrostatic methods and electro thermal methods to get images onto the papers.

17. What are basic lines attributes?

Basic line attributes are its type, its width, and its color.

18. Define DDA.

The digital differential analyzer (DDA) is a scan-conversion line algorithm based on calculating either Δy or Δx.

19. How to perform boundary fill algorithm?

To perform boundary fill algorithm, start 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.

20. Define 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.
inquirePolylineIndex ( )

21. Write about any one 2D transformation.
Rotation: A 2D rotation is applied to an object by repositioning it along a circular path in the xy plane.
The rotation equation is: P' = R.P where,

$$R=\begin{bmatrix} cos\theta & -sin\theta \\ sin\theta & cos\theta \end{bmatrix}$$

22. What is translation?
Translation: A translation is applied to an object by repositioning it along a straight line path from one coordinate location to another.
P' = P + T
Where, $T = \begin{pmatrix} tx \\ ty \end{pmatrix}$

23. What is composite transformation?
We can set up a matrix for any sequence of transformations as a composite transformation matrix by calculating the matrix product of the individual transformations.

24. Define the term modeling.
The creation and manipulation of a system representation is termed as modeling. Models for a system can be defined graphically, or they can be purely descriptive, such as a set of equations that defines the relationships between system parameters.

25. Define geometric symbols.
Components parts of the system are displayed as geometric structures, called symbols, and relationships between the symbols are represented with a network of connecting lines. Three standard symbols are used to represent logic gates for Boolean operations: *and, or & not.*

26. Give examples for valuator.
The examples for valuator are joysticks, trackballs, tablets.

27. How to classify the logical Input devices?
The six logical input devices classifications are:
1) Locator
2) Stroke
3) String
4) Valuator
5) Choice
6) Pick

28. What is parallel projection?

28. What is parallel projection?

In a parallel projection, coordinate positions are transformed to the view plane along parallel lines. The two types are orthographic and oblique parallel projection.

29. What is perspective projection?

For perspective projection, object positions are transformed to the view plane along lines that converge to a point called the projection reference point or center of projection.

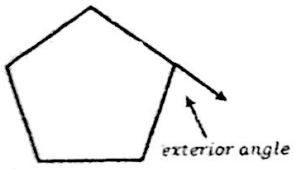
30. What is orthographic parallel projection

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

31. **What is orthographic oblique projection?**

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

32. Draw a diagram to represent a polygon



33. What are the methods available for hidden surface?

The two methods available for hidden surface are: object-space and image-space methods.

34. What are object-space methods?

Object-space methods compares object and parts of objects to each other within the scene definition to determine which surfaces, we should label as labels.

35. Define image space method.

In image space method visibility is decided point by point at each pixel position on the projection plane.

36. Define Projection.

Once world-coordinate descriptions of the objects in a scene are converted to viewing coordinates, we can project the three-dimensional objects onto the two-dimensional view plane.

37. What is polygon?

A polygon is any closed continues sequence of line segments ie, a polyline whose last node point is same as that of its first node point. The line segments form the sides of the polygon and their intersecting points form the vertices of the polygon.

38. Define constraint

A constraint is a rule for altering input-coordinate values to produce a specified orientation or alignment of the displayed coordinates.

39. Give examples for STROKE device.
The examples of stroke devices are mouse, trackball, joystick or tablet.

40. What are output primitives? Define
Graphics programming packages provide function to describe a scene in terms of basic geometric structures, referred to as output primitives.

41. What are basic colors and why are we calling it as such?
In color displays, 24 bits per pixel are commonly used, where 8 bits represent 256 levels 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.

42. Name the additional transformation related to 2-dimension
Reflection and Shear

43. What is meant by clipping?
Clipping is the method of cutting a graphics display to neatly fit a predefined graphics region or the view port.

44. Define depth cueing
A simple method for indicating depth with wireframe displays is to vary the intensity of objects according to their distance from the viewing positions.

45. Give the coordinate representation of any one of 3D transformation
The coordinate representation of 3D translation is:
$x' = x + t_x$, $y' = y + t_y$, $z' = z + t_z$

46. Define antialiasing.
The process of adjusting intensities of the pixels along the line to minimize the effect of aliasing is called antialiasing.

47. Write the general principle steps for converting a world coordinate to device coordinate.
1. Perform scaling transformation that scales the window area to the size of viewport
2. Translate the scaled window area to the position of the viewport
3. Mapping selected parts of a scene in normalized coordinates to different video monitors with workstation transformations.

48. What is the concept of wireframe visibility method?
Procedures for determining object edges are referred to as wire-frame visibility methods