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If you want to learn computer programming then contact with me

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Today paper of CS602 on 25-5-2013 at 11:00am

Total MCQs 20 of each one maks

Two question of 2 marksis

Two question of 3 marks

Two question of 5 marks

MCQ'S

1. Interlacing the horizontal refresh_____
2. Tesselation can be adaptive to the _____ degree of curvature of a surface.

Local

Static

Global

Variable

3. DDA stands for_____

Digital Differential Analyzer

4. The _____ test are performed for the midpoints b/w pixwls near the circle parth at each sampling step.

Parabolla function

Ellipse funtion

Circle funtion

None of the above

5. The actual filling process in boundary filling algorith begins when a point _____ of the figured is selected.

Outside the boundary

Inside the boundary

At boundary

None of the above

6. Discard a line with both endpoints outside clipping boundary is called as _____

Trivial accept

Trivial reject

Total outside

None of the above

7. _____is the tendency of the text to flash as it moves up or down.

Flickering

Snow

Distortion

None of the above

8. _____is the set of points that are equidistant from its origin.

Circle

Parabola

Hyperbola

Ellipse

9. In _____ algorithm, old color must be read before it is invoked.

Scane-line Filling

Floodfill

Both of the above

None of the above

10. The dot product of two vectors A & B is _____ if the angle b/w them is less than 90 or greater than 270.

Greater than zero

Less than zero

Equal to zero

None of the abve

11. The axonometric projection is _____ where the direction of projection makes same angle with all axes.

DIMETRIC

Isometric

Oblique

Trimetric

12. The _____ technique has the direction of projection perpendicular to the viewing plane, but the viewing direction is NOT perpendicular to one of the principle faces.

We can draw the circle using _____

Pentane

Hexane

Trident

Octant

13. _____ direct view storage tube maintains the picture display.

Electron gun

Proton gun

Flood gun

All of the above

14. To move a _____ from one location to another, we translate the center point and redraw the same using new center point.

Arc

Parabola

Circle

All of the above

15. Because clipping against one edge is independent to all others, so it is _____ arrange the clipping stages in a pipeline.

Possible

Impossible

Sometimes impossible

None of the above

16. If the polygons are _____ line clipping techniques are sufficient for clipping.

Filled

Unfilled

Half filled

All of the above

17. Polygons consisting of _____ can cause problems when rendering.

Non-coplanar vertices

Co-planar vertices

Any vertices

None of the above

SUBJECTIVE:

We want to scale an object two times the existing x-axis and y-axis. Write the scaling matrix for this transformation. (2 MARKS)

What we must consider before rotaion of a point? (2 MARKS)

How can we find distance between two 3D points using mathematical notation? (3 MARKS)

Write final expression of composite rotation matrix. (3 MARKS)

Write points of difference between Cavalier and cabinet. (5 MARKS)

Write the formulas of the following: (5 MARKS)

translation P'=

scaling P'=

rotation P'=

composite transition P'=

Also concern following past papers for preparation:

PAST PAPERS:

Total MCQs 20 of each one maks

Two question of 2 marksis

Two question of 3 marks

Two question of 5 marks

Q1. define rotation in 2d ? (2)

Q2. describe the diagram that is 0n the page # 200 2nd diagram... (5)

q3. formula to find length of the vector.

q4. write a c program to draw a circle using polar coordinatx

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on December 12, 2012 at 10:52am

Today CS602 Midterm Term Paper

Total Question = 26

Total Mcqs of 1 marks of each = 20

Total 2 Marks Question = 2

Total 3 Marks Question = 2

Total 5 Marks Question = 2

write the two techniques of triangle rasterization. 2 marks

ek tha k in 2-D can a polygon be divided if yes then write the reason?

what is the taxonomy of the families of the projection? shayd 5 mrks ka tha

write the following formula in column 2? 5 marks

ek table given tha jiske ek side par names or dusri side par unke formulas likhne the in 3-D?

translation P'=

scaling P'=

rotation P'=

shear P'=

composite transition P'=

What is meant by the viewing Frustum? (2)
In 3D graphics what we consider before the rotation of a point? (2)
Clock wise rule Walter Atherton Polygon clipping method.....(3)
Texture mapped triangle Rasterization.....(5)
Reflection in 2D transformation.....(3)
Diff. b/w Lacal and Global Coordinate syatem.....(5)

Current paper 2012 solved

21.

Can we implement texturing and shading at a same time? Justify your answer.

Sol:

Using texturing and shading at the same time is quite straightforward to implement: the basic idea being that we just interpolate the values of both texture and shade and blend them in a suitable ratio (alpha-blending).

22.

Sol:

What is the difference between local coordinate and global coordinate system?

• Local coordinate systems can be defined with respect to global coordinate system

• Locations can be relative to any of these coordinate systems

• Locations can be translated or "transformed" from one coordinate system to another.

23.

What is meant by the Viewing Frustum?

Sol:

The Viewing Frustum

A viewing frustum is 3-D volume in a scene positioned relative to the viewport's camera.

The shape of the volume affects how models are projected from camera space onto the screen.

In 3D computer graphics, the **viewing frustum** or **view frustum** is the region of space in the modeled world that may appear on the screen; it is the field of view of the notional camera. The exact shape of this region varies depending on what kind of camera lens is being simulated

24.

> Suppose you are working in a software house and you are a team lead. You are working on OpenGL based graphics application. The team developed the graphics objects but there is a problem with them i.e. the objects are sheared in the negative direction of X-axis. You are required to make them correct. What you will do in this situation? Give transformation matrix that you will apply to objects using Homogeneous Coordinates.

Sol:

Translation with Homogeneous Coordinates
The translation can now be expressed using homogeneous coordinates as:

$$\begin{bmatrix} x' \\ y' \\ 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & t_x \\ 0 & 1 & t_y \\ 0 & 0 & 1 \end{bmatrix} . \begin{bmatrix} x \\ y \\ 1 \end{bmatrix}$$

Abbreviated as:

$$P' = T(tx, ty) \ . \ P$$

Rotation with Homogeneous Coordinates
The rotation can now be expressed using homogeneous coordinates as:

$$\begin{bmatrix} x' \\ y' \\ 1 \end{bmatrix} = \begin{bmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix} . \begin{bmatrix} x \\ y \\ 1 \end{bmatrix}$$

Abbreviated as:

$$P' = R(\theta) \ . \ P$$

Scaling with Homogeneous Coordinates
The scaling can now be expressed using homogeneous coordinates as:

$$\begin{bmatrix} x' \\ y' \\ 1 \end{bmatrix} = \begin{bmatrix} S_x & 0 & 0 \\ 0 & S_y & 0 \\ 0 & 0 & 1 \end{bmatrix} . \begin{bmatrix} x \\ y \\ 1 \end{bmatrix}$$

Abbreviated as:

$$P' = S(Sx, Sy) \ . \ P$$

25.

Write down the formula for calculating unit vector from a given 3D vector <x,y,z>.

Sol:

Unit Vector

Often in 3D computer graphics you need to convert a vector to a unit vector, ie a vector that points in the same direction but has a length of 1.

This is done by simply dividing each component by the length:

Let <x,y,z> be our vector, length = sqrt(x*x + y*y + z*z)

$$\text{Unit vector} = \frac{\langle x,y,z \rangle}{\text{length}} = \left| \frac{x}{\text{length}}, \frac{y}{\text{length}}, \frac{z}{\text{length}} \right|$$

(Where length = |<x,y,z>|)

26.

> Suppose a company was working on game development for mobile devices. As you know the screen sizes and resolutions of mobile devices are much smaller than desktop computers. Suppose the company has developed a game **The Race** which is very popular game. A school requested the company to convert the game to a computer game. Now the problem is to scale the objects in the game by 8 times bigger and also to rotate at 25 degrees. You are the project director of this game and you have to give the scaling and rotation matrix to the developers.

Sol:

scaling

$$\begin{bmatrix} S_x & 0 & 0 & (1-S_x)X_f \\ 0 & S_y & 0 & (1-S_y)Y_f \\ 0 & 0 & S_z & (1-S_z)Z_f \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

Using Matrices for Rotation

Roll (rotate about the Z axis):

$$\begin{bmatrix} x' \\ y' \\ z' \\ 1 \end{bmatrix} = \begin{bmatrix} \cos\theta & -\sin\theta & 0 & 0 \\ \sin\theta & \cos\theta & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \\ 1 \end{bmatrix}$$

Pitch (rotate about the X axis):

$$\begin{bmatrix} x' \\ y' \\ z' \\ 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & \cos\theta & -\sin\theta & 0 \\ 0 & \sin\theta & \cos\theta & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \\ 1 \end{bmatrix}$$

Yaw (rotate about the Y axis):

$$\begin{bmatrix} x' \\ y' \\ z' \\ 1 \end{bmatrix} = \begin{bmatrix} \cos\theta & 0 & \sin\theta & 0 \\ 0 & 1 & 0 & 0 \\ -\sin\theta & 0 & \cos\theta & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \\ 1 \end{bmatrix}$$

26.

Apply the follwoing transformations on the point P(x,y) = (4,5)

1. Translate using Tx = 3 and Ty = 2
2. Scale using Sx = 2 and Sy = 1

Sol:

Formula to solve this question

$$x' = x + t_x, \quad y' = y + t_y$$

$x' = x.S_x$

$y' = y.S_y$

25.

What is meant by word "image rendering"?

Sol:

Rendering - The process of computing a two dimensional image using a combination of a three-dimensional database, scene characteristics, and viewing transformations. Various algorithms can be employed for rendering, depending on the needs of the application.

23.

Write down pseudo code or a function in C/C++, which will take T_x and T_y as parameters and translate points (x1,y1) and (x2,y2).

Sol:


```
void translate(int tx, int ty)
{
        xc+=tx;
        yc+=ty;
        x1+=tx;
        x2+=tx;
        x3+=tx;
        x4+=tx;
        y1+=ty;
        y2+=ty;
        y3+=ty;
        y4+=ty;
}
```

22.

Briefly explain axonometric projections in the context of computer graphics.

Sol:

Axonometric projections are orthographic projections in which the direction of projection

is not parallel to any of the three principal axes. *Non orthographic parallel projections*

are called oblique parallel projection.

21.

How can we define Composite Transformation?

Sol:

we can find a matrix for any sequence of transformation as a

composite transformation matrix by calculating the matrix product of the individual

transformations.