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Question No : 41 of 52 Marks: 2 (Budgeted Time 4 Min)

Write down the names of four areas in which developers use OpenGL for 2D and 3D graphics?

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Answer (Please click here to Add Answer)

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Question No : 42 of 52 Marks: 2 (Budgeted Time 4 Min)

Give vector equation for a plane curve using second degree polynomial?

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Answer (Please click here to Add Answer)

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Question No : 43 of 52 Marks: 2 (Budgeted Time 4 Min)

What is the basic unit of time in animation?

VuAnswers.com

Answer (Please click here to Add Answer)

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Question No : 44 of 52 Marks: 2 (Budgeted Time 4 Min)

For line clipping, briefly describe the following two cases.

- Trivial Accept
- Trivial Reject

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Answer (Please click here to Add Answer)

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Question No : 45 of 52 Marks: 3 (Budgeted Time 6 Min)

Write down the procedure to use one-dimensional evaluator?

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Answer (Please click here to Add Answer)

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Question No : 46 of 52 Marks: 3 (Budgeted Time 6 Min)

Write down the possible behavior of light when hitting the boundary layer at the intersection of two media?

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Answer (Please click here to Add Answer)

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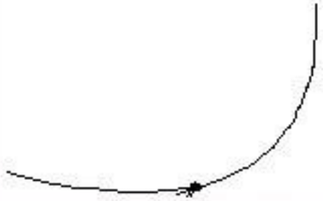
Question No : 47 of 52 Marks: 3 (Budgeted Time 6 Min)

Explain following figure in term of drawing curve:



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Answer (Please click here to Add Answer)

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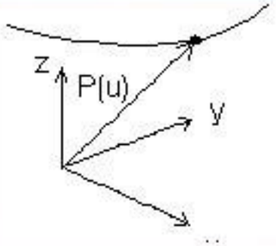
Question No : 47 of 52 Marks: 3 (Budgeted Time 6 Min)



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Answer (Please click here to Add Answer)

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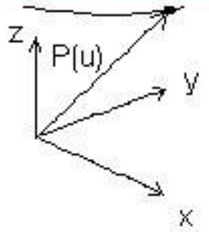
Question No : 47 of 52 Marks: 3 (Budgeted Time 6 Min)



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Answer (Please click here to Add Answer)

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Question No : 48 of 52 Marks: 3 (Budgeted Time 6 Min)

Suppose you are working on a project. You are required to make projections which are perpendicular or parallel to the view plane. What type of projection you will use for it and what are the types of this projection?

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Answer (Please click here to Add Answer)

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Question No : 49 of 52 Marks: 5 (Budgeted Time 10 Min)

What is meant by word "image rendering"?

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Answer (Please click here to Add Answer)

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Question No : 50 of 52 Marks: 5 (Budgeted Time 10 Min)

Why do we use curves? What are the advantages of using curves?

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Answer (Please click here to Add Answer)

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Question No : 51 of 52 Marks: 5 (Budgeted Time 10 Min)

$$x_1 = d_x$$

$$x_2 = \frac{1}{27}a_x + \frac{1}{9}b_x + \frac{1}{3}c_x + d_x$$

$$x_3 = \frac{8}{27}a_x + \frac{4}{9}b_x + \frac{2}{3}c_x + d_x$$

VuAnswers.com

Answer (Please click here to Add Answer)

Made by: Waqar Siddhu

Question No : 51 of 52 Marks: 5 (Budgeted Time 10 Min)

$$x_2 = \frac{\cdot}{27}a_x + \frac{\cdot}{9}b_x + \frac{\cdot}{3}c_x + d_x$$

$$x_3 = \frac{8}{27}a_x + \frac{4}{9}b_x + \frac{2}{3}c_x + d_x$$

$$x_4 = a_x + b_x + c_x + d_x$$

By using given data find the values of a_x, b_x, c_x & d_x ?

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Answer (Please click here to Add Answer)

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Question No : 52 of 52 Marks: 5 (Budgeted Time 10 Min)

Given are the points that lie on a plane P1,

P1<2.0,3.0,4.0>
P2<1.0,5.0,4.0>
P3<7.0,6.0,2.0>

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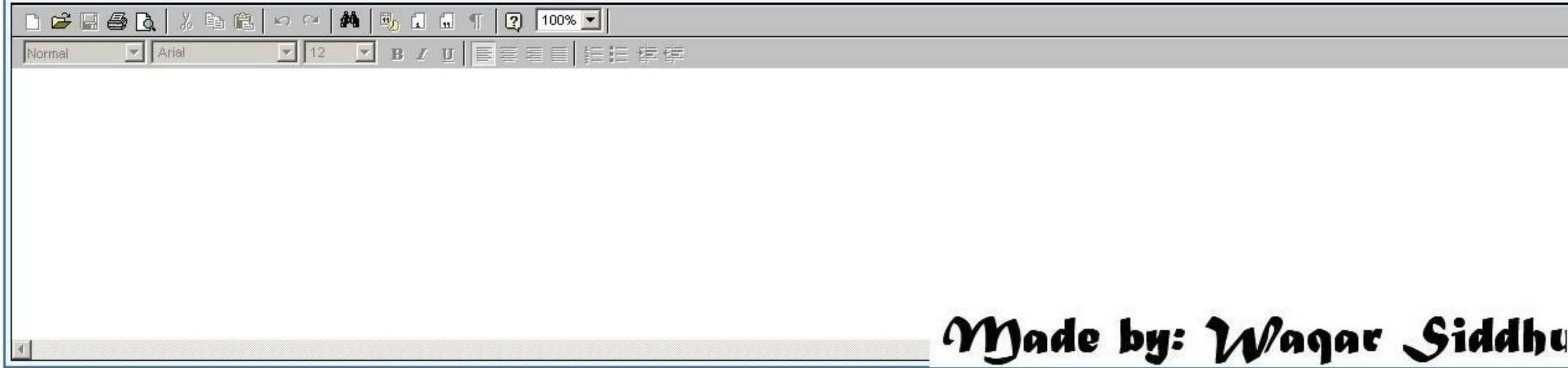
Answer (Please click here to Add Answer)



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Question No : 52 of 52 Marks: 5 (Budgeted Time 10 Min)

P1<2.0,3.0,4.0>
P2<1.0,5.0,4.0>
P3<7.0,6.0,2.0>

You are required to find the equation of a normal to the plane P1.

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Answer (Please click here to Add Answer)

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What is meant by T-intersection in a polygonal model of surface?

Answer (Please click here to Add Answer)

VuAnswers.com

there's no guarantee that the line segments AB and BC lie on exactly the same pixels as the segment AC. Sometimes they do, and sometimes they don't, depending on the transformations and orientation. This can cause cracks to appear intermittently in the surface.

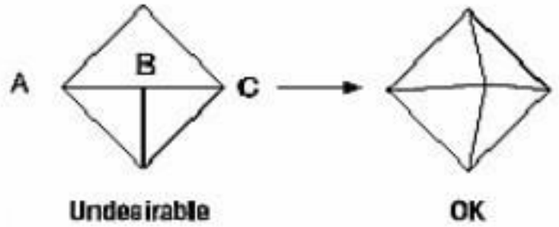

Figure 1 : Modifying an Undesirable T-intersection

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Question No : 42 of 52 Marks: 2 (Budgeted Time 4 Min)

Name the OpenGL function for viewing transformation through camera?

Answer (Please click here to Add Answer)

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The transformation process to produce the desired scene for viewing is analogous to taking a photograph with a camera

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In 3D computer graphics, how can we find the unit vector?

Answer (Please click here to Add Answer)

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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:

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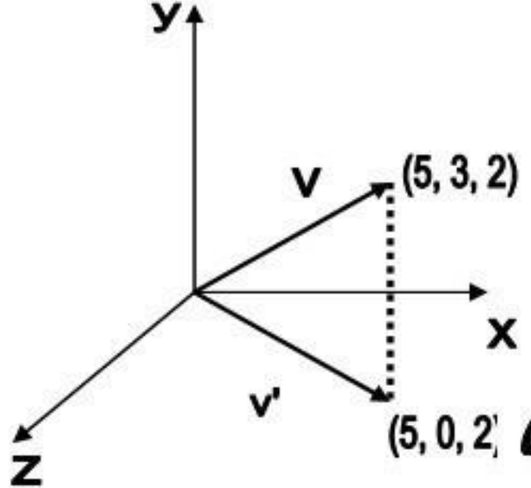
Given the vector V (3,2,1), you are required to find the projection of the vector V on the xz plane.

Answer (Please click here to Add Answer)

VuAnswers.com

Projection of v onto the xz plane

example do by yourself



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Explain critical angle in refraction of light?

Answer (Please click here to Add Answer)

VuAnswers.com

If we use Snell's law for light going from water to air, and plug in 90° for therefracted angle, we get 41.8° for the incident angle. This is called the critical angle atwhich we observe the phenomenon of total internal reflection. At any angle greater thanthis, light will not pass though a boundary but will be reflected internally.

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Write down the simplified third degree equation of Bezier Curve?

Answer (Please click here to Add Answer)

VuAnswers.com

Bezier curves of any degree. In fact the degree of a Bezier curve is equal to n-1, where n is the number of control points.

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Question No : 47 of 52 Marks: 3 (Budgeted Time 6 Min)

Write down the three OpenGL routines for modeling transformations?

Answer (Please click here to Add Answer)

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The three OpenGL routines for modeling transformations are glTranslate*(), glRotate*(), and glScale*().

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Question No : 48 of 52 Marks: 3 (Budgeted Time 6 Min)

What are the diversities among the categories of polygons?

Answer (Please click here to Add Answer)

VuAnswers.com

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Explain Oren Nayer diffuse reflection? How it is different from Lambertian diffuse shading?

Answer (Please click here to Add Answer)

VuAnswers.com

Oren—Nayar Diffuse Reflection

Though there's been a lot of research on specular reflection models, there's been less research on diffuse reflection models. One of the problems of the standard Lambertian model is that it considers the surface as a smooth diffuse surface. Surfaces that are really rough, like sandpaper, exhibit much more of a backscattering effect, particularly when the light source and the view direction are in the same direction.

The classic example of this is a full moon. If we look at the picture of the moon shown in Figure 5, it's pretty obvious that this doesn't follow the Lambertian distribution—if it did, the edges of the moon would be in near darkness. In fact, the edges look as bright as the center of the moon. This is because the moon's surface is rough—the surface is made of a jumble of dust and rock with diffuse reflecting surfaces at all angles—thus the quantity of reflecting surfaces is uniform no matter the orientation of the surface; hence no matter the orientation of the surface to the viewer, the amount of light reflecting off the surface is nearly the same.

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Question No : 50 of 52 Marks: 5 (Budgeted Time 10 Min)

Which type of light from parallel light, Point light and Spot light you would prefer in your lighting model, in the case,

a. You have limited computation power
b. You have no problem of computation power, but you have to make the scene as much realistic as possible.

Answer (Please click here to Add Answer)

VuAnswers.com

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Question No : 51 of 52 Marks: 5 (Budgeted Time 10 Min)

Write the C program that is used to draw the RED color pixel on the 20th row and 20th column of the screen.

Answer (Please click here to Add Answer)

VuAnswers.com

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Suppose a light ray traveling through the air intersects the glass surface at an angle of 40° degrees, Find at which angle this light ray will be refracted from the glass surface?

Take,

Refractive Index of Glass, $n_{Glass} = 1.5$
Refractive Index of Air, $n_{air} = 1$

Answer (Please click here to Add Answer)

VuAnswers.com

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Question No : 41 of 52 Marks: 2 (Budgeted Time 4 Min)

Which function is used to change to the size of the *current window* ?

Answer (Please click here to Add Answer)

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glutReshapeWindow

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Give vector equation for a plane curve using second degree polynomial?

Answer (Please click here to Add Answer)

VuAnswers.com

Normal Arial 12 B I U 100%

$$P(u) = au^2 + bu + c$$

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Write down the difference between one-dimensional and two-dimensional evaluator (only for what type of Bezier shape they are useful with)?

Answer (Please click here to Add Answer)

VuAnswers.com

In two dimensions, everything is similar to the one-dimensional case, except that all the
commands must take two parameters, u and v, into account. Points, colors, normals, or
texture coordinates must be supplied over a surface instead of a curve

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How can we improve rendering efficiency?

VuAnswers.com

Answer (Please click here to Add Answer)

To improve rendering efficiency when dynamically viewing a scene, more or less detailed versions of a model may be swapped in and out of the scene database depending on the importance (usually determined by image size) of the object in the current view.

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Question No : 45 of 52 Marks: 3 (Budgeted Time 6 Min)

Discuss the purpose of OpenGL?

Answer (Please click here to Add Answer)

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As a software interface for graphics hardware, OpenGL renders multidimensional objects into a frame buffer. OpenGL is industry-standard graphics software with which programmers can create high-quality still and animated three-dimensional color images.

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```
#define PI 3.14159265
#define EDGES 30
/* draw a circle */
glBegin(GL_LINE_STRIP);

for (i = 0; i <= EDGES; i++)
```

Answer (Please click here to Add Answer)

VuAnswers.com

Made by: Waqar Siddhu

```
for (i = 0; i <= EDGES; i++)
        glVertex2f(cos((2*PI*i)/EDGES), sin((2*PI*i)/EDGES));
glEnd();
```

Correct this bad code for constructing a closed surface for two-dimensional example?

VuAnswers.com

Answer (Please click here to Add Answer)

To correct the code, make sure that when i == EDGES, you use 0 for the sine and cosine, not 2*PI*EDGES/EDGES. (Or simpler still, use GL_LINE_LOOP instead of GL_LINE_STRIP, and change the loop termination condition to i < EDGES.)

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Write down the procedure to use one-dimensional evaluator?

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Answer (Please click here to Add Answer)

The one-dimensional target parameter specifies what the control points represent, and therefore how many values need to be supplied in points. The points can represent vertices, RGBA color data, normal vectors, or texture coordinates.

For example, with GL_MAP1_COLOR_4, the evaluator generates color data along a curve in four-dimensional (RGBA) color space.

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How does the black and white pictures and color pictures are stored in frame buffer?

VuAnswers.com

Answer (Please click here to Add Answer)

The frame buffer stores information in a two dimensional matrix;
If there is black and white picture then there is only one bit required to store '0' for black or 1 for white and in this case buffer will be referred as **bitmap**.
In colour pictures obviously multiple bits are required for each pixel position depending on the possible number of colours in case if multiple bits are used for one pixel frame buffer will be referred as **pixmap**

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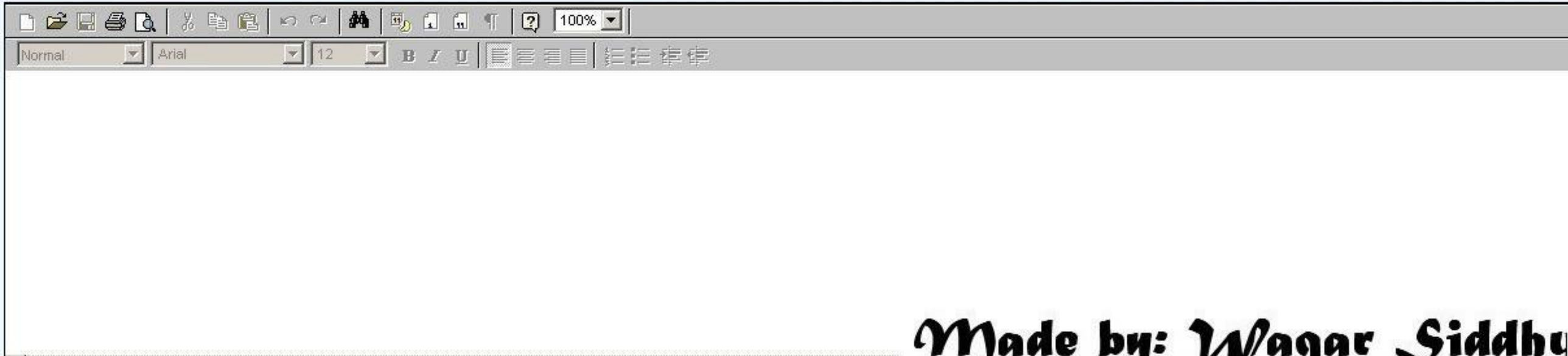
Question No : 49 of 52 Marks: 5 (Budgeted Time 10 Min)

Write down code for making window of size (400,600) and having OpenGL rendering context of rgb, depth and double buffer with window name "Exam Code Window"? (develop this window using OpenGL and glut library in C)

Answer (Please click here to Add Answer)

VuAnswers.com



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Explain how recursive subdivision function of triagle helps in improving the polygonal model of surface?

p 345 read

Answer (Please click here to Add Answer)

VuAnswers.com

When you subdivide a surface, watch out for any nontriangular polygons. The three vertices of a triangle are guaranteed to lie on a plane; any polygon with four or more vertices might not. Nonplanar polygons can be viewed from some orientation such that the edges cross each other, and OpenGL might not render such polygons correctly.

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Which type of light from parallel light, Point light and Spot light you would prefer in your lighting model, in the case,

`. You have limited computation power
b. You have no problem of computation power, but you have to make the scene as much realistic as possible.

Answer (Please click here to Add Answer)

VuAnswers.com

p 243
244

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Question No : 52 of 52 Marks: 5 (Budgeted Time 10 Min)

Consider the Digital Differential Analyzer (DDA) Algorithm for drawing a straight line. Two points P1(2,3) and P2(5,6) are given. You are required to run this algorithm for these points to draw a straight line. Also show the values of variables at each step.

DDA_Line (Point p1, Point p2)
dx = p2.x – p1. x
dy = p2.y – p1. y

Answer (Please click here to Add Answer)

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```
dx = p2.x – p1. x
dy = p2.y – p1. y
x1=p1.x
y1=p1.y
if |dx|>|dy| then
step = |dx|
```

Answer (Please click here to Add Answer)

VuAnswers.com

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```
if |dx|> |dy| then
step = |dx|
else
step = |dy|
xIncrement = dx/step
yIncrement = dy/step
for counter = 1 to step
```

Answer (Please click here to Add Answer)

VuAnswers.com

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xIncrement = dx/step
yIncrement = dy/step
for counter = 1 to step
drawPixel (x1, y1)
x1 = x1 + xIncrement
y1 = y1 + yIncrement

Answer (Please click here to Add Answer)

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