Fall 2021 Graphics Test II Take Home Name

(All work to be done individually)

1. Consider the pyramid given by the following points;

P1(0,5,0)

P2(2,0,-2)

P3(2,0,2)

P4(-2,0,2)

P5(-2,0,-2)

P6(0,0,0)

Note that the front face of the pyramid(face on the positive Z axis) is Red, right face (face on the positive X axis) is blue, back face (face on the negative Z axis) is Red and the left face (face on the negative X axis is Blue. The bottom of the pyramid is Green. The pyramid is a shiny plastic surface.

Write the code to do the following;

1. load the pyramid as an OpenGL icon

2. Create two spotlights.

a. Place light 1 at the point (-7, 8, 4). Make this light strong red light. The light should shine on the pyramid. The light should have no more than a 20 degree width and a fall off exponential of no more than 15.

b. Placed light 2 at point (7,8,4). Make this a strong green light. The light should shine on the pyramid. The light should have no more than a 16 degree width and a fall off exponential of no more than 15.

3. Animate the pyramid so that it moves 2 degrees about the y axis every animation frame. Also slowly rotate the pyramid about the x axis so that the bottom and all sides are visible.

4. Write the code to alternate turning the green light on the degree marker which is an odd multiple of 90 and turn the red light off. Turn the red light on every even degree marker which is an even multiple of 90 and turn the green light off.

5. Be sure and calculate the normals to the surfaces off the pyramid. You may use the function CalcNormals given to you in the class to do this calculation.

100 Points Due beginning of class 11 Nov.