3   Computer Graphics and Image Processing (PR)

Consider the calculation of light emanating from a point on a surface.

(*a*) What is meant by the following terms? Explain how their contribution to the overall amount of reflected light is calculated.

    (*i*)   Ambient illumination   [2 marks]

    (*ii*) Diffuse reflection   [4 marks]

    (*iii*) Specular reflection   [4 marks]

(*b*) Suppose that the surface is represented as a polyhedral mesh with triangular faces. Explain how illumination is calculated across a face using each of the following.

    (*i*)   Gouraud shading   [3 marks]

    (*ii*) Phong shading   [3 marks]

(*c*) Explain where the calculations for Gouraud and Phong shading should be performed when using OpenGL.   [4 marks]