Question 1: Shading

(a)	Some surfaces display specular highlights. Examples of such surfaces include polished tile floors, gloss paint and whiteboards. Other surfaces are purely matte, such as chalk or stone. Describe (including equations) how you would shade a matte and a glossy surface, and discuss why they look different at different viewing angles.	(10 Marks)
(b)	Write a vertex and fragment shader in GLSL (or equivalent shader language) to colour an object using Lambertian (diffuse) shading.	(15 Marks)

Question 2: Illumination

(a)	Given the following fragment shader, determine what you would expect a teapot object to look like if it used this fragment shader.
	
	`vec3 diffuseColour = vec3 (1.0, 0.0, 0.0);`
	`uniform vec3 worldspace_lightDirectionVector;`
	`varying vec3 worldspace_SurfaceNormal;`
	
	`void main(){`
	`  float intensity =`
	`dot(normalize(worldspace_lightDirectionVector,`
	`worldspace_SurfaceNormal);`
	`  if(intensity > 0.95)`
	`    gl_FragColor.rgb = diffuseColour;`
	`  else if (intensity > 0.4)`
	`    gl_FragColor.rgb = diffuseColour * 0.6;`
	`  else`
	`    gl_FragColor.rgb = diffuseColour * 0.2;`
	`}`
		(6 Marks)

(b)	What is the difference between per-vertex and per-pixel lighting? Discuss the advantages and disadvantages of both approaches.	(7 Marks)

(c)	Explain each of the following with respect to illumination models (using diagrams and equations where appropriate):
	  i. The Inverse Square Law
	  ii. The Cosine Rule
		(12 Marks)