Started on	Monday, 30 April 2018, 1:05 PM
State	Finished
Completed on	Monday, 30 April 2018, 2:55 PM
Time taken	1 hour 50 mins
Grade	**10.00** out of 10.00 (**100**%)

Question 1

Correct

Mark 1.00 out of 1.00

Which one of the following aspects is not considered by a local illumination model?

Select one:

- a. Interaction between material colour and light's colour.
- b. Orientation of the object with respect to the light's direction.
- c. Specular reflections from the surface.
- d. Position of the light in the scene.
- e. Transmission of light through a transparent object. ✓

Correct

Marks for this submission: 1.00/1.00.

Question 2

Correct

Mark 1.00 out of 1.00

A ray originating at a point p_0 is given by the equation $p(t) = p_0 + t\,d$, where d is a unit vector. When $t = 10$, we get a point q on the ray given by $q = p_0 + 10\,d$. What does this value of t represent?

Select one:

- a. The colour value at q.
- b. The square of the distance of q from p_0.
- c. The distance of q from p_0. ✓
- d. The magnitude of the vector d.
- e. The angle between the ray and the normal vector at q.

Correct

Marks for this submission: 1.00/1.00.

Question 3

Correct

Mark 1.00 out of 1.00

How are shadows generated in a ray-traced image?

Select one:

- a. For each primary ray, by tracing another ray from the closest point of intersection towards the light and testing if it hits an object. ✓
- b. For each primary ray, by tracing another ray from the farthest point of intersection towards the light and testing if it hits an object.
- c. By using a shadow transformation matrix.
- d. By tracing several rays from the light source and checking if any of them reaches the object.
- e. By applying shadow textures on to objects.

Correct

Marks for this submission: 1.00/1.00.

Question 4

Correct

Mark 1.00 out of 1.00

A ray with equation $p = p_0+td$, where d is a unit vector is generated from the point (3, 8, −10) towards a light source at (3, 20, −10). What is the value of d?

Select one:

- a. (0, −12, 0)
- b. (0, 12, 0)
- c. (0, 1, 0) ✓
- d. (3, 20, −10)
- e. (3, 8,−10)

Correct

Marks for this submission: 1.00/1.00.

Question 5

Correct

Mark 1.00 out of 1.00

A ray originating from (0, 0, 0) in the direction d = (0.0, −0.8, −0.6) meets a horizontal plane that has the equation y = −80. What is the value of the ray parameter t at the point of intersection?
Hint: The point (0, −80, 0) lies on the plane. The plane has a normal vector (0, 1, 0).

Select one:

- a. 80
- b. 1
- c. −80
- d. 100 ✓
- e. 0

Correct

Marks for this submission: 1.00/1.00.

Question 6

Correct

Mark 1.00 out of 1.00

A primary ray $p = p_0 + td$ generates two equal values 1.9, 1.9 for t when tested against a sphere. The sphere intersection method flags the ray as not intersecting the sphere. Why?

Select one:

- a. The ray passes through the centre of the sphere.
- b. The value t=1.9 is invalid.
- c. The intersection point lies behind the view position.
- d. The ray is tangential to the sphere. ✓
- e. Any value of t greater than or equal to 1 can be ignored.

Correct

Marks for this submission: 1.00/1.00.

Question 7

Correct

Mark 1.00 out of 1.00

A secondary ray $p = p_0 + td$ generates two distinct values 0.0, 0.2 for t when tested against a sphere. What can be concluded about the ray or the sphere?

Select one:

- a. The ray originates from a point on the sphere. ✓
- b. The sphere is centered at the origin.
- c. The ray does not intersect the sphere.
- d. The ray originates from inside the sphere.
- e. The ray originates from the light source.

Correct

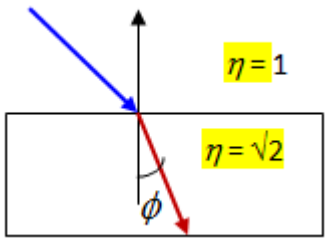
Marks for this submission: 1.00/1.00.

Question 8

Correct

Mark 1.00 out of 1.00

A ray (in blue colour) hits a glass box at an angle of 45 degs with the normal vector. The refractive index of glass is set by the user as √2 (=1.414). What is the value of the angle of refraction shown in the figure below?



Select one:

- a. 45 degs.
- b. 90 degs.
- c. 0 degs.
- d. 30 degs. ✓
- e. 60 degs.

Your answer is correct.

Correct

Marks for this submission: 1.00/1.00.

Question 9

Correct

Mark 1.00 out of 1.00

A ray tracing application uses bounding volumes (such as spheres, axis aligned bounding boxes) for

Select one:

- a. computing shadows.
- b. anti-aliasing.
- c. lighting calculations.
- d. reducing the number of ray-polygon intersection tests. ✓
- e. increasing the number of ray-polygon intersection tests.

Correct

Marks for this submission: 1.00/1.00.

Question 10

Correct

Mark 1.00 out of 1.00

In ray tracing applications, supersampling is a method used for

Select one:

- a. anti-aliasing. ✓
- b. mapping a texture to an object.
- c. increasing brightness of the scene.
- d. reducing ray-polygon intersection tests.
- e. increasing the resolution of the ray traced image.

Correct

Marks for this submission: 1.00/1.00.