Brac University
Department of Computer Science and Engineering

CSE 423: Computer Graphics

Theory Assignment 04 | Full Marks: 25 | Semester: Spring 2025

Answer **all** the following questions.

1.

a. What should be the values of $\mathbf{k_d}$ and $\mathbf{k_s}$ of a mirror? Explain. **[2]**

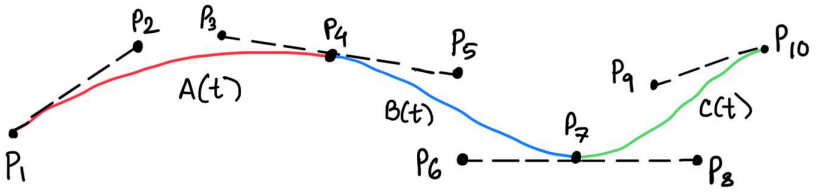
b. A light source with intensity 30 is located at the point **(5, -9, 15)**. Light is reflected from the **z=3** plane, which has ambient, diffuse, and specular coefficients of 0.5, 0.8 and 0.7 respectively. The shininess factor of the plane is 1.2. Compute the total reflected light intensity at the point **(-4, 0)** on the plane when viewed from the point **(-10, 6, 11)** and with an ambient intensity of 10. **[5]**

c. Compute the total reflected light intensity again using the **H, halfway vector.** Explain if you see any difference in the final values of I. **[3]**

d. In question (b), "When looking from the point (-10,6,11), the point (-4,0) on the z=3 plane will have the **highest specular** reflection." Do you agree with this statement? Justify your opinion. **[3]**

2.

Cersei is drawing an accurate illustration of the dragon Balerion to properly visualize its magnanimity. She needs to ensure that the curves enclosing Balerion's fire breath are smooth. Suppose a part of it resembles the spline below with 3 Bezier curves:



Cersie wants to at least achieve **C(2)** continuity in the spline.

a. What conditions **(control point dependencies)** need to be met for this spline to be **C(1)** continuous? **[4]**

b. What conditions need to be met for this spline to be **C(2)** continuous? **[6]**

c. Mention all control points to be locked/dependent for the spline to be **C(2)** continuous? **[2]**

Hint: At every joint, check if A'(1)= B'(0) for C(1) continuity & A''(1) = B''(0) for C(2)