BRAC UNIVERSITY
Department of Computer Science and Engineering
CSE423 : Computer Graphics
SET A

Examination: Quiz 3 | Semester:Fall 2025
Duration: 35 Minutes | Full Marks: 20

Answer the following questions. You MUST show the steps/calculations where applicable.
Figures in the right margin indicate marks.

Name:	ID:

$$\begin{bmatrix} 1 & 0 & -0.2 & 10 \\ 0 & 1 & 0.5 & -20 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & -0.025 & 2 \end{bmatrix}$$

1. The above matrix is a composite transformation matrix that combines multiple transformations into a single matrix including simple purpose perspective projection. Using this answer the following questions:
   a. Find out the Center of Projection. **[4]**
   b. How far is the Projection Plane (PP) from the Center of Projection (COP) in terms of units? **[2]**
   c. A 3D vertex P(60, 25, 85) is projected on the projection plane. Determine the projected coordinate P' on the projection plane. **[6]**

2. A 3D point P, located at coordinates (5, 25, -30), is to be projected onto the XY plane using Cavalier Projection. Given that the projection has an orientation angle of 30°, determine the updated coordinates of the projected point P'. Detail your calculation process. **[5]**

3. Explain the key geometric property preserved by parallel projections, and how this property distinguishes them from perspective projections. Give an example of a practical application where preserving this property is crucial. **[3]**