National Institute of Technology Hamirpur
Department of Computer Science & Engineering
Computer Graphics (CS-314)
End Sem Exam, Date: 24 Nov, 2023

Timing: 2:00 to 5:00 PM   July-Dec 23, V Semester   Max mark: 50

Instruction: Attempt all questions.
Assume necessary and sufficient data if something is missing

1. (a) Explain CMY Color Model. Also write a program for the conversion from RGB to CMY and vice-versa. (CO4) **(5)**

   (b) What do you understand by Input/Output devices? List the characteristics for the following display technologies:(i) Raster systems (ii) Vector systems (iii) Plasma panels (iv) LCDs. (CO1) **(5)**

2. (a) Stepwise illustrate DDA line drawing algorithm. Draw a line (0, 0) to (6, 6) using DDA line drawing algorithm.(CO2) **(5)**

   (b) What do you mean by Composite transformation? A Triangle is defined by $\begin{pmatrix} 3 & 5 & 5 \\ 3 & 3 & 5 \end{pmatrix}$. Find the transformed co-ordinates after the following transformations: (i) 90^0 rotation about origin (ii) Reflection about X-axis. (CO2) **(5)**

3. (a) Apply the Cohen Sutherland line clipping algorithm to clip the line segment with coordinates (30,60) and (60,25) against the window with (X_{wmin}, Y_{wmin}) = (10,10) and (X_{wmax}, Y_{wmax}) = (50,50). (CO3) **(5)**

   (b) What are various text clipping methods? Compare flood fill and boundary fill algorithm illustrating the same with a diagram. (CO3) **(5)**

4. (a) Explain window to viewport transformations pipeline.Show that the composition of two successive rotations is additive i.e. $R(\theta_1).R(\theta_2) = R(\theta_1 + \theta_2)$. (CO2) **(5)**

   (b) Write an equation for Combined Diffuse and Specular Reflections with Multiple Light Sources. Compare Object-Space and Image-Space methods of Visible-Surface Detection. (CO3) **(5)**

5. (a) What do you mean by projection? Differentiate between parallel projection and perspective projection. (CO4) **(5)**

   (b) Define Zero order geometric continuity (g^0), First order geometric continuity (g^1), First order parametric continuity (c^1) and Second order parametric continuity (c^1). Also give properties of Bezier Curve. (CO5) **(5)**

Best wishes