581 : D-1stHf08. Comp.C Computer Graphics. 16/6/08

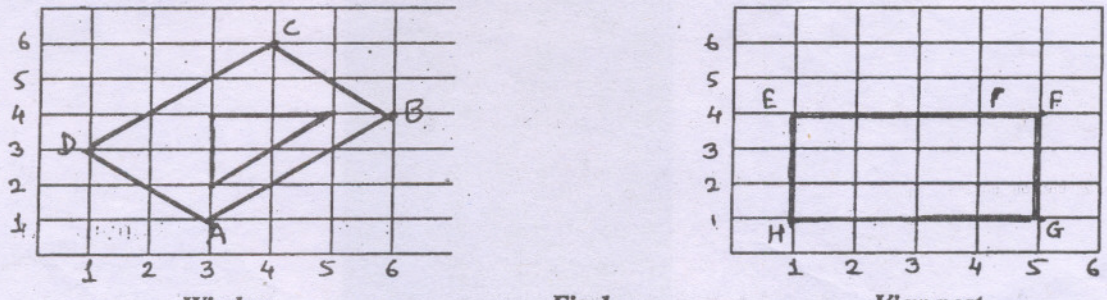
Con. 2975-08. **(REVISED COURSE)** **CO-2890**

(3 Hours) **[Total Marks : 100**

N.B. (1) Question No. **1** is **compulsory.**
(2) Attempt any **four** questions out of remaining **six** questions.

1. (a) What will be the effect of scaling factor Sx = 1/2 and Sy = 1/3 on a given Δ ABC ? Whose coordinate are A[4, 1], B[5, 2], C[4, 3]. **20**
   (b) Derive the parametric equation for a cubic Bezier curves for n = 3.
   (c) Derive 2D Translation and Rotation matrix.
   (d) Differentiate between Raster scan display and Random scan display.

2. (a) Discuss and explain Bresenhaum's algorithm for circle generation ? Consider an origin centered circle of radius 4. Determine the pixel that will be put ON. **10**
   (b) **Figure-1** bellow show a window (A, B, C, D) and Viewport (E, F, G, H). Show how the wind and object in it is mapped to Viewport. **10**



Window *Fig-1* *View port*

3. (a) Using the origin as the centre of projection. Derive the perspective transformation onto the plane passing through point R0(X0, Y0, Z0) and having the normal vector N = ai + bj + ck. **10**
   (b) Consider the Δ ABC whose coordinate are A[4, 1] B[5, 2] C[4, 3] **10**
   - Reflect the given Δ about x-axis
   - Reflect the given Δ about y-axis
   - Reflect the given Δ about y = x
   - Reflect the given Δ about y = –x

4. (a) Write a line clipping algo. Which uses parametric form of equation ? Test it for a line P1P2 whose P1 = (10, 10) P2 = (60, 30) against the window with (Xwmin, Ywmin) = (15, 15), (Xwmax, Ywmax) = (25, 25). **10**
   (b) What are the digital differential analyzers ? Draw a line using DDA, having co-ordinate as (–1, –4) and (5, 6). **10**

5. (a) Give the mathematical equation of Bezier curves state its properties and advantage. **10**
   (b) Discuss various area filling method state their merits and demerits. **10**

6. Write short notes on :— **20**
   (a) Sweep representation
   (b) Z buffer algorithms
   (c) Octree method
   (d) Half toning and dithering techniques.

7. (a) Explain Guard shading method for shading state its advantage and disadvantage. **10**
   (b) Differentiate between Image space and Object space. Explain the scan like algorithm. **10**